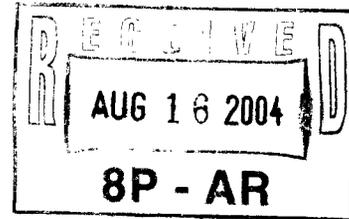


Technical Support Documentation
for the Salt Lake City CO Maintenance Plan
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DRAFT

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**Technical Support Documentation (TSD)
Salt Lake City Carbon Monoxide (CO) Maintenance Plan**

Introduction

The Salt Lake City Carbon Monoxide (CO) Maintenance Plan Technical Support Documentation (TSD) is attached.

The Technical Support Documentation is organized into four parts: Inventory Preparation Plan, the Salt Lake City 1993 Base CO Inventory, projection inventories from 2004 to 2019, and a CD-ROM containing electronic files of supplemental MOBILE6.2 support data.

UTAH DIVISION OF AIR QUALITY

CARBON MONOXIDE EMISSION

INVENTORY PREPARATION

PLAN

June 2004

**TABLE 1
INVENTORY LEVELS**

Inventory Category	Description of Inventory	Reason(s)
Level I	Point Source data collected by Continuous Emission Monitor (CEM) for compliance purposes	Data directly tied to permit for program to be legally defensible. Requirements include detailed performance audits and QA plan.
	Operating permits data required under Title V of the CAA	Data directly tied to permit fee program is used to demonstrate compliance.
Level II	CAA-mandated State Implementation Plan (SIP) inventories	Site-specific information is gathered for point sources with stringent QA/QC requirements. Results may be used to support strategic decision-making, standard setting, or to evaluate the effectiveness of regulations.
	National inventories developed in support of national Emission Standards for Hazardous Air Pollutants (NESHAP), New Source Performance Standards (NSPS), and Maximum Achievable Control Technology (MACT) Standards	Data is used to develop and evaluate emission reduction/control strategies. Site-specific data is generally required, but not necessarily direct source sampling.

I. Introduction

A. Purpose of Inventory

On March 3, 1978, the Environmental Protection Agency (EPA) designated the city of Salt Lake as a nonattainment area in accordance with the provisions of Section 107 of the federal Clean Air Act (CAA). On November 15, 1990, Congress amended the CAA resulting in Salt Lake City being designated as a “not classified” non-attainment area based on monitoring data from 1988-1989.

On December 18, 1994, an exceedance of the 9-ppm eight-hour average CO standard was measured in Salt Lake City. This is the only exceedance that has been measured since 1987. On August 7, 1996 the Utah Air Quality Board adopted a CO Maintenance Plan for Salt Lake City.

The purpose of this inventory is to fulfill the requirement of the CAA that plans be updated every eight years and to substantiate that the federal National Ambient Air Quality Standard (NAAQS) for CO will not be exceeded in the future.

The purpose of this plan is to provide procedures in enough detail to compile a reasonably accurate, representative, and complete CO emissions inventory. Furthermore, it is through

this plan that EPA can determine the quality and completeness of the inventory data collected by UDAQ.

B. Scope

The procedures and quality assurance criteria contained in this plan are based on the EPA EIP guideline published to facilitate the collection of point, area, mobile, biogenic, geogenic, and hazardous air pollution (HAP) emission inventory data. The inventory includes all sources of CO emissions in Salt Lake City.

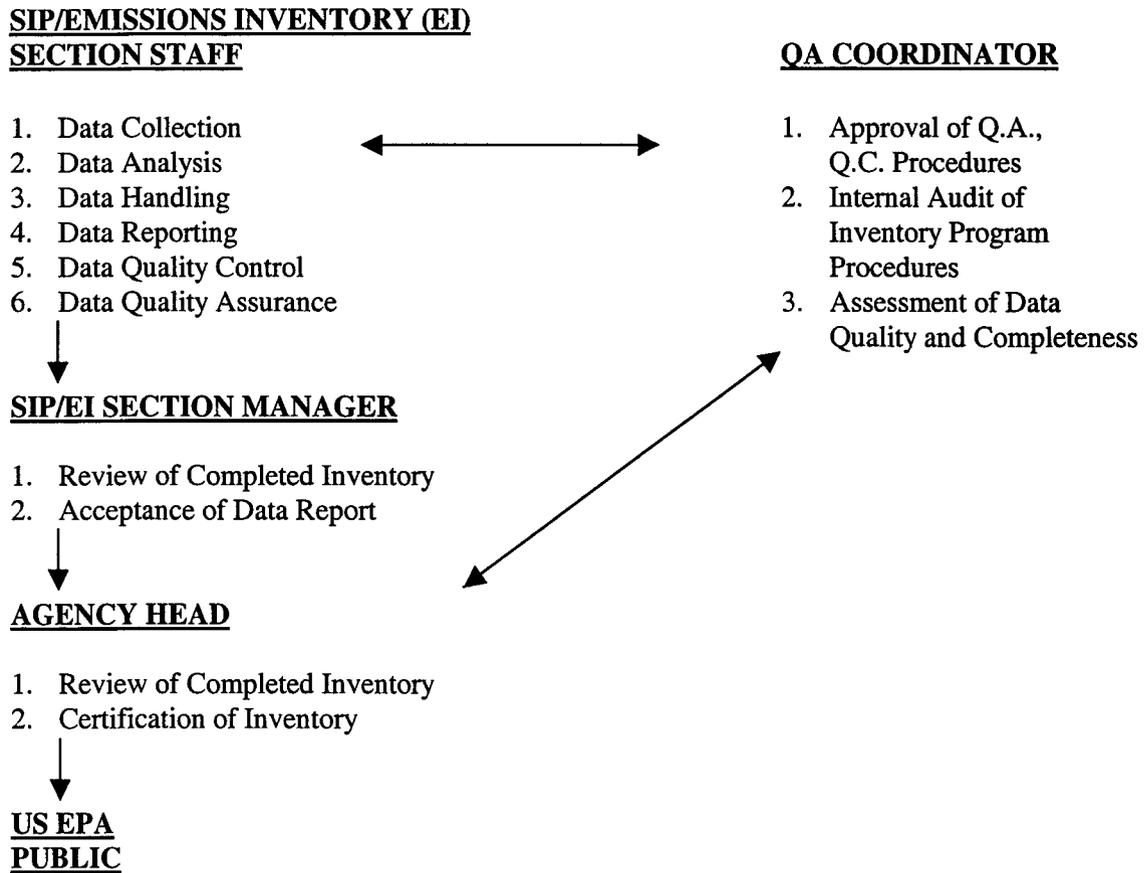
This document is dynamic and will be revised and updated in a timely manner to reflect changes in regulations and guidelines. It is divided into thirteen sections due to the relative complexity of the subject matter. Section I explains the purpose, scope, and objectives of the manual. Section II defines the domain area. Section III identifies areas of responsibility. Section IV addresses staff training needed for developing the inventory. Section V explains point source data collection. Section VI describes area source data collection. Section VII covers on-road mobile inventory data collection, and Section VIII covers off-road emissions data collection. Emission inventory data analysis is explained in Section IX. Section X describes the approach for the SIP maintenance demonstration. Section XI explains data handling. Section XII describes inventory reporting. Section XIII looks at internal and external quality assurance audits.

C. Objectives

This Emission Inventory Preparation Plan has been compiled to give the reviewer a basic understanding of the emission inventory procedures and QA program implemented by UDAQ. It is designed to inform the reader of the methodology used to collect and analyze the data, of QC checks applied to assess reasonableness of the information collected, and of independent checks performed to estimate the effectiveness of the program. Most importantly, it is designed to provide every inventory staff member with the necessary information on how QC must be applied to each task performed. The inventory staff is required to follow the procedures outlined in this document in every detail to assure uniformity in all aspects of data collection, analysis, and reporting, and to produce data that is as correct as possible and legally defensible. The flow of data through the agency is illustrated in Figure 1.

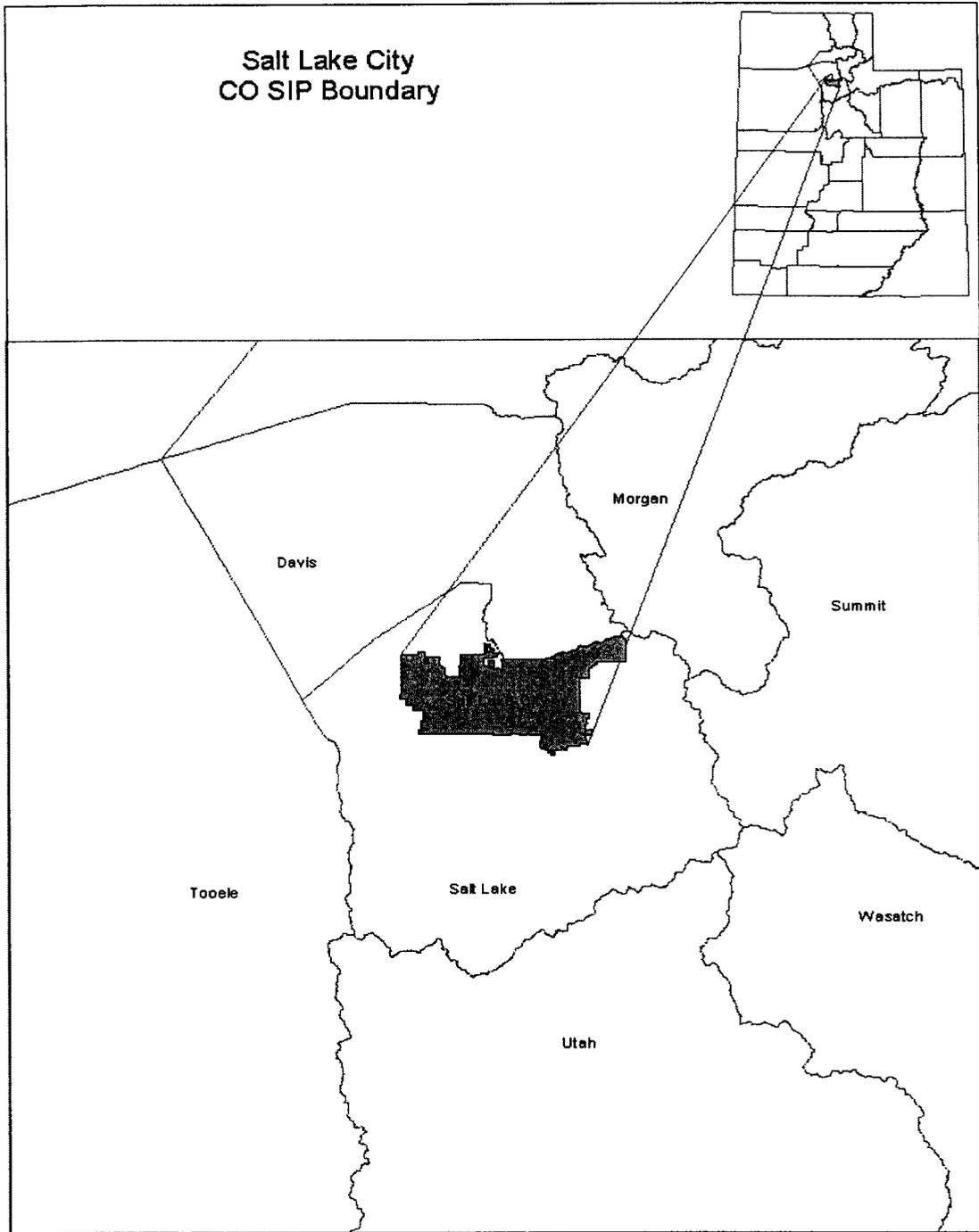
Figure 1

INVENTORY DATA FLOW THROUGH THE AGENCY



II. **Nonattainment and Maintenance Areas**

In general, the emission inventory will address all CO pollution sources in the domain. The emissions domain consists of sources within the boundaries of Salt Lake City. A map of the area is shown on the following page.



The domain does not include areas outside Salt Lake City because CO concentrations are very dependent on the proximity of the emission sources.

III. Areas of Responsibility

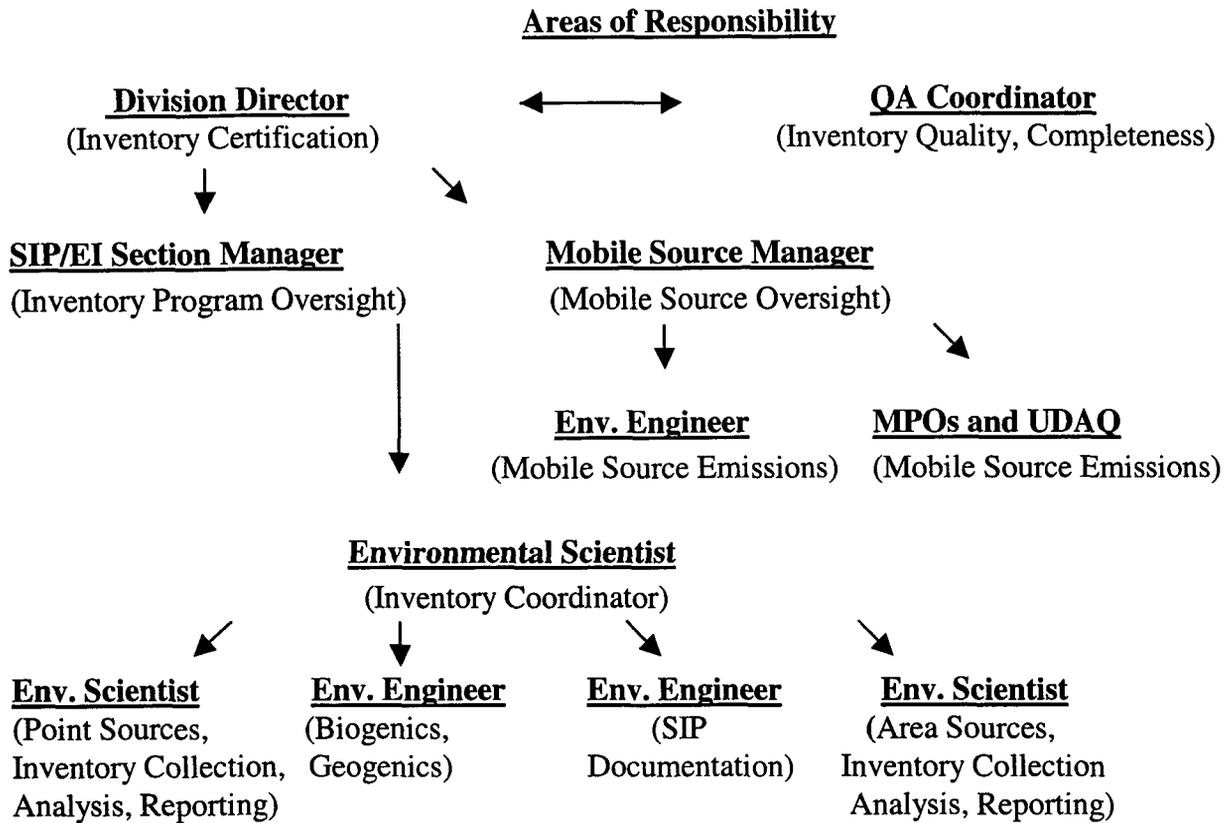
The SIP/EI Section is assigned to compile the point source, area, and off-road mobile emission inventories for UDAQ.

The local Metropolitan Planning Organization (MPO), Wasatch Front Regional Council, will calculate on-road mobile source emissions in Salt Lake County.

The Mobile Source staff will review the mobile source emission inventories submitted by the MPO.

The SIP/EI and Mobile Source Sections are two of the eight sections of UDAQ under the supervision of environmental health managers. The division QA coordinator, who is directly responsible to the division director, supervises emission inventory QA. The QA coordinator oversees the implementation of quality control measures, reviews procedures for completeness and compliance with EPA regulations, and performs periodic internal audits to assure correct and consistent application of QA methods. The completed inventory report will be certified by the division director as being accurate and complete to the best of his/her knowledge. The individuals involved in the development of the emissions inventory are listed below.

<u>Name</u>	<u>Task</u>	<u>Phone</u>
Rick Sprott	Final Approval	(801) 536-4000
Carol Nielsen	Coordination	(801) 536-4073
Lynn Menlove	Quality Assurance	(801) 536-4076
Dave McNeill	SIP/EI Development	(801) 536-4037
Joe Thomas	Mobile	(801) 536-4175
Kip Billings	Mobile Sources – WFRC areas	(801) 363-4250
Richard McKeague	Mobile Sources – UDAQ	(801) 536-4025
Peter Verschoor	Mobile Sources – UDAQ	(801) 536-4186
Scott Hanks	Point Sources	(801) 536-4066
Deborah McMurtrie	SIP Documentation	(801) 536-4187



IV. Emission Inventory Training Program

UDAQ will not compile an official training manual for collecting emission inventories. The “Handbook for Criteria Pollutant Inventory Development: A Beginners Guide for Point and Area Sources” will be used as a reference manual for these two types of sources.

Individuals that acquire expertise in the different areas of the inventory program will provide training to other staff on an as-needed basis.

V. Point Source Emission Inventory Data Collection

A. Threshold Values for Point Sources in Tons per Year – Base Year

For the 1993 CO SIP base-year inventory, the threshold for submitting an inventory for sources located in Salt Lake County is emissions of 100 tons or more of CO. CO emissions from sources under the above thresholds will be included in the area source base-year inventory. No known point sources in Salt Lake City meet the threshold in 1993.

B. Emission Inventory Source Categories

1. The CO point source categories to be inventoried include:
 - a. external combustion sources
 - b. stationary internal combustion sources
 - c. hot-mix asphalt plants
 - d. petroleum industry
 - e. food and agricultural industries
 - f. mining and quarrying
 - g. secondary metal processing
 - h. metallurgical industries
 - i. miscellaneous sources
2. Point source categories whose CO emissions vary significantly based on the ambient air temperature will be identified. Ambient and operating temperature for other source categories may be considered when developing emission factors for EPA's "Compilation of Air Pollutant Emissions Factors" (AP-42).

C. Identification of Point Sources

1. A list of point sources will be compiled by reviewing the following:
 - a. existing emissions inventories
 - b. division permit and compliance files
 - c. industrial directories
 - d. telephone directories
 - e. professional publications
 - f. EPA Control Technique Guidelines (CTG) source listings
 - g. standard industrial classification code (SIC)
 - h. Utah Department of Transportation
 - i. State Tax Commission
 - j. State Data Center publications

- k. State Office of Planning and Budget publications
 - l. State Energy Commission publications
 - m. federal agencies
 - n. local trade associations
2. The assembled list will be checked against the source listings to make sure that all existing sources are addressed. In cases where information is sketchy, telephone and/or site visits will be used to verify if the source is still in existence.
 3. Basic information pertaining to each source (e.g., source name, current mailing address, county, contact person, etc.) will be updated on an ongoing basis as new information becomes available.

D. 1993 Point Source Emissions Inventory Collection

1. Forms and instructions will be sent to each source known or suspected to cause air pollution above the threshold values specified in Section V.A of this document using the correct mailing address and the name of the plant manager or contact person if available.

The letter will contain reasons for the inventory, instructions on how to obtain necessary forms, UDAQ's return address, the date by which the forms must be returned, UDAQ contacts, and identify penalties for failure to return the forms.

2. Current addresses for any undeliverable letters will be researched and the letters will be resent by certified mail.
3. The mailing list will be reviewed to verify that each source returns appropriate forms.
4. All sources that have not returned the forms by the specified date will be contacted by phone to verify their receipt of the letter. If they have not received the letter, their mailing address will be verified and another letter will be sent out at once. At that time, the possibility of penalties will be explained and a new deadline of 30 days from the time of the call will be set.
5. The completeness of information on the returned forms will be checked and any additional information will be requested either by phone or letter, depending on the importance of the information requested.
6. Inspectors will be sent to sources that appear to provide misleading information on the forms. Site emission points and accuracy of data provided will be verified. Calculations and assumptions will be reviewed with the contact person at the facility.

E. Point Source Projection Inventory Data

Projections will be forecast using actual emissions grown by employment estimates made by the Governor's Office of Planning and Budget (GOPB).

1. A list of domain sources will be generated.
2. Each source will be categorized using Standard Industrial Classification (SIC) codes.
3. Each group of industry employment projection numbers is grouped according to county and a range of SIC codes. The percent change in each group of GOPB employment projection numbers from one year to another will be used to determine the change in the corresponding point source inventory data for the corresponding years.
4. Actual emissions from the 1993 emission inventory will be grown using these calculated growth estimates.

VI. Area Source Inventory Data Collection

A. Area Emission Inventory Source Categories

The following area source categories have been identified and will be inventoried for the CO SIP inventory. Only CO emissions from the following categories will be used in the process. Stationary sources of emissions not included in the point source inventory will be included in the 1993 area source inventory. For the point source thresholds, refer to Section V.A of this document.

Combustion Sources

1. stationary sources using fossil fuel, e.g., wood, natural gas, fuel oil, and coal
 - residential
 - commercial and institutional
 - industrial (excluding point source overlap)
2. other combustion sources
 - structural fires
 - vehicle fires
 - charcoal grilling/broiling

B. Method of Calculation of Area Source Categories

The calculation methods for the above area source categories have been identified and are listed in Table 2. These methods will be used for calculating the annual 1993 base-year area source inventory.

TABLE 2
AREA SOURCE EMISSION CALCULATION METHODS

CATEGORY	METHOD
Combustion, Coal	EIIP, "Area Source Category Method Abstract – Coal Combustion" and supplemented with AP-42, Section 1.1, "Bituminous and Sub-bituminous Coal Combustion" and Section 1.10, "Residential Wood Stoves"
Combustion, Natural Gas	EIIP, "Area Source Category Method Abstract – Natural Gas and LPG Combustion" and supplemented with AP-42, Section 1.4, "Natural Gas Combustion"
Combustion, Oil	EIIP, "Area Source Category Method Abstract – Fuel Oil and Kerosene Combustion," and supplemented with AP-42, Section 1.3, "Fuel Oil Combustion"
Combustion, Wood	EIIP, Vol. III, Chapter 2, "Residential Wood Combustion," Alternative Method using the decline of fuel wood sold in Utah during 1991 through 2000 to determine the per capita emission factor used during 2001.
Fires, Structural	EIIP, Vol. III, (1/27/99 edition), Chapter 18, "Structure Fires"
Fires, Vehicle	EIIP, Vol. III, (5/15/00 edition), "Area Source Category Method Abstract - Vehicle Fires"

C. Sources of Activity Level Information

1. Sources of activity level information will be identified for each area source category. The EIIP guidance documents will be used to identify the appropriate source of information for each category. Activity level information will be requested from sources such as the Department of Transportation, State Tax Commission, State Data Center, State Office of Planning and Budget, State Energy Commission, federal agencies such as the U.S. Census Bureau, county and local government agencies, airports, natural gas suppliers, and local trade associations.
2. Examples of Activity Level Data Collected
 - a. ambient air data from the National Weather Service records

- b. location and size of public schools from the Utah State Office of Education, "Utah School Directory"
- c. consumption of natural gas from Questar Corporation
- d. coal, propane, kerosene, distillate, and fuel oil consumption from numerous Department of Energy, Energy Information Administration, and Department of Natural Resources publications; i.e., "Utah Energy Statistical Abstract"
- e. other energy consumption from the multiple information sources listed above

D. Collection of Area Source Information

- 1. The appropriate source of information will be contacted for each area source category by consulting the information list maintained by UDAQ.
- 2. Contact will be made with the person designated to provide the information.
- 3. The importance of the inventory will be explained and the request will specify a date by which all the information is to be received. The person submitting the records will be asked to transmit them to UDAQ by letter over their signature.
- 4. All records received will be logged in.
- 5. All sources of information that have not responded to the information request by the specified date will be called or visited to make sure the information is being collected. At that time, a new deadline of 30 days from the time the source is re-contacted will be set.
- 6. Completeness of information received will be checked and additional information will be requested, if needed.

E. Area Source Emission Apportionment for Salt Lake City

Since the CO domain includes only Salt Lake City, a method has been devised to rationally divide countywide totals for each polluting category. The CO emissions from each category are indexed to one of two distribution methods. Those methods are:

- 1. distribution by facility location (IN-OUT)
- 2. distribution by county human population residency (POP)

These area source categories are indexed to one of these two distribution methods as described below.

IN-OUT: Airport Activity

The activity of these categories is linked to the actual location of each event or facility.

When one of these sites falls inside the domain, all the emissions from that site are attributed to the domain. Conversely, when a site falls inside a given county but outside the domain, no emissions are assigned to the domain. The Salt Lake City International Airport is the only known airport within the CO domain (Salt Lake City).

POP: Combustion of Wood, Coal, Oil and Natural Gas; Miscellaneous Nonroad Engines; and Structure and Vehicle Fires

The activity of these categories are most closely linked to the needs of people as they provide hot water and space heating to their homes, maintain their homes, cars, and health, and use recreational equipment. The distribution of POP is determined by equation, as detailed below.

$$\text{Pop IN} = [((\text{Land IN} \times \text{Balance}) + \text{known IN}) / \text{All Pop}] \times 100$$

Where:

Pop IN, (%) = the percentage of people estimated to live inside the domain's portion of Salt Lake County.

Balance, (numeric value) = the number of people, listed by census, residing in Salt Lake County that do not hold residency in Salt Lake City. These people are presumed to reside in the unincorporated areas of the county. Since no further easily-assessable information is known about their residency, they are presumed to reside uniformly over the entire county, some residing inside and some outside the domain. Table 3 lists the population of Salt Lake County in 1993 and the number of people known to be in the domain area (**Known IN** area) followed by the **Balance** population.

Known IN, (numeric value) = the number of people residing in Salt Lake City in 1993. Populations are taken from the *U.S. Bureau Of The Census*, for the year 1993.

All Pop, (numeric value) = the total human population, listed by census, of Salt Lake County.

TABLE 3

Apportionment By Population inside the Domain, 1993

Salt Lake	
All Pop	791924
Known IN	160233
Balance	631,691
Pop IN	20.23%

F. Area Source Projection Inventory Data

The growth indicators that will be used for the area source projections are contained in Table 5.

**TABLE 5
GROWTH INDICATORS FOR PROJECTING EMISSIONS FOR AREA SOURCE CATEGORIES**

Source Category	Growth Indicators	Information Source
Structure and Vehicle Fires, and Charcoal Grilling	Human population; Forecast based on all resources available to the state's primary growth planning agency	Utah Governor's Office of Planning & Budget, website
Wood Combustion	Forecast of historic trend of volume of fuel wood sold in Utah; Forecast of human population	U.S. Forest Service's Timber Sale Accounting Office, Utah Governor's Office of Planning and Budget
Coal, Fuel Oil Combustion	Forecast of historic consumption trends of coal and oil	Utah Department of Energy, "Utah Energy Abstract," Annual Reports
Natural Gas Combustion	Forecast of historic consumption trend of natural gas	Questar Gas Company, largest natural gas supplier in Utah
Railroad Engines	Forecast of historic trend of rail activity	Union Pacific Railroad, largest railroad company in Utah
Aircraft flights and engine maintenance	Partial forecast by agencies designed for that purpose; UDAQ forecast additional years based on historical trend line	Utah Department of Transportation, Division of Aeronautics; Wasatch Front Regional Council
Miscellaneous Nonroad Engines	Directly from EPA's NONROAD software; Every year run separately, 1995-2050	NONROAD software

VII. On-road Mobile Inventory

This inventory is done by WRFC. Methods of collection and calculation can be review in the "On-Road Mobile section of the Salt Lake City CO SIP technical support document.

VIII. Off-road Mobile Inventory Data Collection

A. Off-road Mobile Source Categories

The following are off-road mobile source categories included in the emission inventory:

1. aircraft
2. railroad locomotives
3. off-highway vehicles
 - agricultural
 - airport
 - commercial
 - construction and mining

- industrial
- lawn and garden
- logging
- pleasure craft
- recreational

The EIIP will be reviewed and the EPA NONROAD model will be run to determine if additional categories should be added to this list.

B. Sources of Off-road Emission Inventory Data

Sources of activity level information will be identified for each off-road mobile source category such as:

1. State Office of Planning and Budget
2. federal agencies
3. county and local government agencies
4. airports
5. EPA's NONROAD model

C. Collection of Off-road Emission Inventory Data

1. The appropriate source of information will be contacted for each off-road source category by consulting the information list maintained by UDAQ.
2. Contact will be made with the person designated to provide the information.
3. The importance of the inventory will be explained and the request will specify a date by which all the information is to be received. The person submitting the records will be asked to transmit them to UDAQ by letter over their signature.
4. All records received will be logged in.
5. All sources of information that have not responded to the information request by the specified date will be called or visited to make sure the information is being collected. At that time, a new deadline of 30 days from the time the source is re-contacted will be set.
6. Completeness of information received will be checked and additional information will be requested if needed.
7. This data will include:
 - number and types of airports in Salt Lake County: commercial, civil and military
 - total takeoffs and landings of each type of aircraft e.g., single, twin, and jet engine, and, when known, the specific plane and engine type

- number of railroads operating in the state
- rail trip length through the individual counties
- type of locomotive
- locomotive fuel consumption

D. Methods of Calculation

The methods of calculating the off-road mobile source categories have been identified and are listed in Table 7.

**TABLE 7
OFF-ROAD EMISSION CALCULATION METHODS**

CATEGORY	METHOD
*Nonroad, Aircraft Engines	Emissions and Dispersion Modeling System (EDMS) software model, directly
*Nonroad, Aircraft Maintenance	EDMS software model, indirectly
*Nonroad, Railroad Engines	Procedures for Emission Inventory Preparation, Vol. IV: "Mobile Sources"
Other Off-road Mobile Sources	Run the EPA NONROAD model and make appropriate adjustments to the output

*Category not included in EIIP.

When EPA releases the final version of NONROAD, UDAQ will re-run the model if there is a significant difference between the draft NONROAD emission estimates and the final NONROAD estimates.

E. Off-road Emission Apportionment for Salt Lake City

1. Airport Activity

The method to apportion airport activity within partial counties within the domain will be IN-OUT (see Section VI.F of this document). The location of each airport will be identified and the activity and emissions from each incoming and outgoing airplane within Salt Lake City will be included in the inventory.

2. Railroad Activity

In apportioning railroad activity within Salt Lake City, the percentage of railroad lines within the city compared to the lines in Salt Lake County will be used. The emissions from the diesel consumed by each railroad company in Salt Lake County will be calculated on a countywide basis, then the percentage will be applied to distribute railroad emissions to Salt Lake City.

3. Other Off-road mobile Sources

Apportioning of other off-road mobile sources within Salt Lake City will be made using human population (see Section VI.F of this document).

F. Off-road Mobile Source Episode Day Emissions Inventory Data

Annual off-road mobile source emissions will be calculated using 1993 data. The EPA ONROAD model will be run for 1993.

IX. Emission Inventory Data Analysis

A. Emissions Data Quality

As Table 1 indicates, the 1993 emissions inventory is considered a Level II inventory because it will provide support for a SIP. Therefore, the following quality control procedures will be followed:

1. The date of each questionnaire will be checked to verify that the inventory submitted by a source is for the year specified. Data from a previous year will be accepted only if no data is available for the inventory year and the data is representative.
2. The professional capability of the source's emissions data collector to accurately complete the inventory forms will be assessed. Some smaller sources will not have the expertise to provide all of the required information. Assistance will be provided to these sources within the limit of available UDAQ resources.
3. Emissions estimates for each point source and area source category will be compared to the most recent inventory. For a point source, if the difference is large and no new permit has been granted for the process, the facility will be inspected for data verification. For an area source category, if the difference is large and no records of substantial change in growth exist, the area will be visited for data verification.
4. Each point source and area source category collection technique used to compile the data will be analyzed. If the technique does not apply to the source category or is inaccurate, the data will not be accepted.
5. Double counting occurs when emissions from a source are included in both the area source and point source emissions. To avoid this, known point source emissions will be subtracted from area emissions. For example, after the total natural gas consumption is calculated from utility records, the known point source consumption will be subtracted from the total. The difference is the area source contribution.

B. Emissions Inventory Data Validation

The following steps will be done to validate the inventory data:

1. The data will be reviewed for the following errors:
 - a. use of incorrect equations
 - b. transposition of digits
 - c. decimal errors
 - d. incorrect emission factor applications
 - e. use of incorrect or inconsistent measurement units
 - f. incorrect units and unit conversions
 - g. incorrect entry of numbers into the calculator
2. Emission estimates will be checked for the following:
 - a. imprecise emission factors
 - b. errors in throughput information
 - c. improper interpretation of combined sources
 - d. faulty assumptions about control device efficiency
3. Data outside the acceptable range (outliers) will be checked. This includes things such as:
 - a. claiming 100 percent control efficiency
 - b. no emissions while the facility was operating
 - c. very high or very low emissions not characteristic for a source category (decimal placement error)
4. Emission estimates will be compared to established limits for each area source category. For example:
 - a. Emission rates reported for an area source category should be in the same range as emissions estimates based on emission factors.
 - b. The excess air for a combustion process should not be less than 5 percent, 10 percent, and 25 percent for gas, coal, and oil, respectively. In general,

excess air should not be greater than 100 percent for any combustion process.

- c. If the stack temperature is below 100 degrees F, a combustion process should not be assumed. If the stack temperature is below 250 degrees F and no scrubber is involved, the temperature specified might be too low, and if the stack temperature is above 250 degrees F and a scrubber is used, the temperature may be too high.
 - d. Fuel usage data should be checked by dividing the annual fuel consumption by the number of operating hours per year. If this ratio exceeds the maximum design-firing rate, an error is indicated. If the ratio is less than 0.15 times the maximum continuous rate, than equipment utilization is either very low or incorrect data has been specified.
5. The ratio of normal to maximum production rates should be checked to see that they approximate the ratio of normal to maximum emission rates. Where these proportions differ, the emissions calculations will be rechecked for errors.

Most of the errors listed in 1 through 5 above can be identified by looking for unreasonable emission estimates (data outside of the acceptable range) not typical for a particular type of source or area source category. For confirmation of unreasonable emission estimates, a review engineer familiar with the source category will be consulted. The accuracy of the calculations provided by a source will be determined by the engineer designated to recalculate and enter emission estimates into the emission inventory database.

In future years Excel spreadsheets will be used to do emission calculations for many of the inventoried sources. These calculations will be checked for reasonableness and accuracy when the spreadsheet is developed for individual sources. The calculations will then be locked to provide assurance that the calculations will not be changed. This will provide an automatic QC for each source.

C. Evaluation of the Uncertainty of Emission Estimates

UDAQ will use the Data Quality Ranking System or some elements of it as suggested in Volume VI of the EIP provided that adequate resources are available. Since the more sophisticated approaches suggested in the guidance require expertise and additional staff time, it is not likely that any of them will be implemented in the near future. However, the division is committed to adjust emission uncertainty assessment methods upward as resources become available. The most likely methods to determine emissions uncertainty will be qualitative discussions and some subjective data quality rating.

The general steps used for QA will be as follows:

The reasonableness of the inventory data will be assessed by determining how much quality control effort has been applied to each step in the emission inventory development. The relative accuracy of the emission data will be prioritized by assigning the highest accuracy to data collected with CEM's or determined from stack test results, less accuracy

when using AP-42 emission factors, and least accuracy when based on engineering judgment. Data completeness will be addressed by cross-referencing known facilities to other sources of information. Some completeness assessment will also be made using responses to questionnaires and information requests. Data consistency will be determined by compiling documentation showing that procedures are followed as written and that methodologies applied during the inventory development for all sources in a source category are identical.

D. Emission Factors

1. Availability of Emission Factors

Whenever CEM data or emission factors developed from representative source test data is not available, emission factors contained in the most recent update of AP-42 will be used. This document covers most of the common emission sources. If emissions factors are not available in AP-42, the following sources will be checked:

- a. EIIP
- b. NSPS
- c. EPA Control Technique Guidelines
- d. source assessments and other EPA studies aimed at relating process parameters to emissions of specific industrial processes
- e. proceedings of conferences sponsored by EPA, the Air Pollution Control Association (APCA) and other ecological organizations

Emission factors will be prioritized by assigning the highest accuracy to emission factors developed from representative source test data and less accuracy to emission factors contained in AP-42 and other publications. Source test data will be used only if the test was performed according to EPA's specifications.

2. Development of Emission Factors

If no AP-42 or other emission factors are available for processes, emission factors will be developed using material balance or engineering estimates.

To use material balance, exact quantities of materials entering and exiting the process will be needed at all emission points.

Engineering estimates are based on an analogy with similar processes. The estimates will be made by visiting the plant to observe the process, by estimating emissions on site, and by observing stack emissions.

3. Calculation of Emissions using Emission Factors

- a. The following equation will be used to calculate emissions estimates:

$$E = R \times EF \times [1 - (C/100)]$$

Where:

E = emissions estimate (at process level)

R = activity level (such as throughput)

EF = emission factor (such as pounds emitted per throughput)

C = control device efficiency (in percent) if the EF does not include a level of control

- b. The individual input parameters will be reviewed to make sure they are reasonably accurate.
- c. All assumptions and engineering judgments used in the calculations will be documented on a prepared form or in the computer and will be kept as a permanent record available for review.

E. Activity Data

1. An evaluation of activity data will be done.

Activity data will be reported as a fuel consumption rate for fuel burning equipment and as a material processed weight for industrial processes. For optimum activity assessment, hourly averages will be used. They will be submitted by sources or computed using operating patterns; e.g., five days per week, eight hours per day, two-week vacation period.

2. Conversion units will be specified on the inventory forms.
3. All activity data in BTUs per hour will be converted using the following conversion factors:

$$1 \text{ BTU/hr} = 2.93 \times 10^{-4} \text{ kW}$$

$$1 \text{ BTU/hr} = 8.32 \times 10^{-4} \text{ LB steam/hr (300 psi, saturated)}$$

F. Control Device Efficiency

1. Control device efficiency may be determined by source testing.
- a. Pollutant concentrations will be measured before and after the control device.

- b. The age of the control device will be taken into account since component deterioration may reduce efficiency.
 - c. The permit file or the review engineer will be consulted to verify that the control device is the proper size for the operation.
2. Control device efficiency may be determined by using literature (AP-42 or EIIIP).
- a. The control device efficiency listed in literature should be reasonably applicable to control devices employed at the inventoried facility.
 - b. The size of the control device should be analyzed to make sure it is the proper size for the process under consideration.

When using manufacturer's design specifications to assess control efficiency, the possibility of obtaining the efficiency under actual conditions should be studied. Excessive maintenance and upset conditions will also affect control efficiency and will be taken into account.

G. Rule Effectiveness and Rule Penetration

Rule effectiveness (RE) and rule penetration (RP) will not be applied to the CO domain inventory because there are no known major sources in Salt Lake City during the base year.

X. SIP Demonstration

The UDAQ will use future inventories to demonstrate that the Salt Lake City CO SIP is maintaining the CO NAAQS standard.

XI. Data Handling

A. Data Recording and Coding

- 1. The verified emissions data for point sources and calculated emissions for area source categories will be summarized. Enough information will be included so that the data can be arranged and presented according to:
 - a. source category
 - b. nonattainment areas
 - c. attainment/maintenance areas
 - d. counties

- e. area sources
 - f. point sources
 - g. county and state totals
2. After entry, all information will be checked to verify that it was entered correctly.
 3. The questionnaires will be checked for missing and incomplete data overlooked during the initial verification of the questionnaire. This data will be retrieved if possible.
 4. Each emissions estimate value will be coded according to the method of collection. Examples of collection methods include value estimation, source testing, AP-42 emission factors and locally determined emission factors.

B. Data Tracking

1. Tracking of Raw Data
 - a. All questionnaires and area source activity level information will be retained and filed.
 - b. Important correspondence and logs of phone calls will be filed as permanent, but easily retrievable records.
 - c. The raw data will be stored in the emission inventory database that is backed up on a regular basis.
 - d. Records of unusual but valid emissions data will be identified and stored for future reference.
 - e. The need for updating the emission inventory database will be assessed annually.
 - f. A list of all new sources will be kept.
 - g. A record of the following will be retained in the source file:
 - emission estimates
 - calculations
 - pertinent notes and references
2. Tracking of Corrected Data
 - a. Records of all corrections performed on the raw data will be retained.
 - b. Reasons for the corrections will be included.

3. Tracking of Missing Data
 - a. A record of all missing data will be kept.
 - b. Reasons for missing data will be explained.
 - c. A list of methods used to estimate values for missing data will be retained.

XII. Emission Inventory Reporting

A. Raw and Summarized Data

1. An electronic and a hard copy report will be compiled containing the following information:
 - a. a letter of certification signed by the director of UDAQ stating that the inventory is complete and accurate to the best of his knowledge and collected according to established procedures contained in regulations and guidelines
 - b. an introduction to the report explaining the reason for collecting the inventory, the reporting format, including graphs, charts, tables and trends, time intervals, etc., the geographical area involved, and the estimated reliability of the inventory

Source categories for which the emissions are negligible will be listed as "neg." Source categories for which there are no emissions in the study area will be listed as "0."

B. Inventory Supporting Documentation

The following inventory supporting documentation will be submitted:

1. map of the geographic area covered by the inventory
2. specific methods used to collect the inventory including:
 - a. sources of information for point, area, and mobile sources
 - b. sources of emission factors including emission factors developed by the agency
 - c. methods of calculating emissions
 - d. significant assumptions made during collection and analysis
 - e. exclusion of known pollution sources

- f. QA/QC results from internal audits and external audits (if applicable)
3. Inventory data consistency, completeness and reasonableness

To report on consistency, completeness, and reasonableness of inventory data, a narrative will be submitted including QA/QC documentation addressing the following items:

- a. successful implementation of the Inventory Preparation Plan
- b. rigorous application of quality control procedures
- c. consistency in data collection, analysis, and reporting
- d. internal and external (if applicable) audit results
- e. references of documentation used to compile the inventory

XIII. Internal and External Quality Assurance Audits

A. Internal Quality Assurance Audits

1. Ongoing independent QA oversight will be performed.
2. Planning, data collection and analysis, data handling, and data reporting will be addressed prior to compiling the inventory.
3. Review and necessary updating of all procedures will be done prior to compiling the inventory to assure compliance with federal regulations and guidelines.
4. Monthly interviews of inventory personnel will be conducted.
5. Inventory records will be check to insure consistent application of procedures for every task performed.
6. The questionnaire design will be updated based on responses from previous inventory requests.
7. Ten percent of the calculations performed by the inventory staff will be re-calculated.
8. A monthly review of logs and records maintained by the inventory staff will be conducted to check for accuracy, completeness, and availability for inspection.
9. Logs and records will be checked for initials of persons responsible for them in order to establish data traceability.

10. Appropriate ranges used to define outliers (data outside the expected range) will be verified.
11. The finalized emission inventory report will be reviewed for completeness no later than one month after the completion date.
12. All QA findings will be summarized for the agency head.

B. External Quality Assurance Audits

1. A draft of the completed inventory will be submitted to EPA for review and comments.
2. The inventory will be revised based on comments and audit results that are federal requirements, reasonable requests, and within the budget constraints of UDAQ.
3. An invitation will be sent to EPA to conduct an independent audit of the UDAQ inventory program.
4. If resources permit, a draft copy of the inventory will be sent to a qualified contractor for review and comments.
5. The emission inventory will be revised using the same criteria applied to comments provided by EPA.
6. Comments provided by the contractor will be submitted with the inventory.

References

Procedures For Emission Inventory Preparation
Volume I Emission Inventory Fundamentals
EPA-450/4-81-026a

Procedures For Emission Inventory Preparation
Volume II Point Sources
EPA-450/4-81-026b
September 1982

Procedures For Emission Inventory Preparation
Volume III Area Sources
EPA-450/4-81-026c
September 1981

Procedures For Emission Inventory Preparation
Volume IV Mobile Sources
EPA-450/4-81-026d (Revised)
1992

Procedures For Emission Inventory Preparation
Volume IV Mobile Sources
EPA-450/4-81-026d
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Procedures For Emission Inventory Preparation
Volume V Bibliography
EPA-450/4-81-026e
September 1981

Emission Inventory Requirements For Post - 1987
Ozone State Implementation Plans
EPA-450/4-88-019
December 1988

Guidance For Initiating Ozone/CO SIP Emission Inventories
Pursuant To The 1990 Clean Air Act Amendments
February 1991

Emission Inventory Requirements For Ozone State Implementation Plans
EPA-450/4-91-010
March 1991

Emission Inventory Requirement For Carbon Monoxide State Implementation Plans
EPA-450/4-91-011

Quality Review Guidelines For 1990 Base Year Emission Inventories
EPA-450/4-91-022 Draft Report
September 1991

Example Emission Inventory Documentation For Post 1987 Ozone State Implementation Plans (SIPs)
EPA-450/4-89-018
October 1988

Guidance For the Preparation Of Quality Assurance Plans For O₃/CO SIP Emissions Inventories
EPA-450/4-88-023
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Volume I Third Edition
EPA-450/4-88-021
December 1988

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EPA-450/0-00-000
February 1990

Airs Facility Subsystem Source Classification Codes And Emission Factor Listing For Criteria Air
Pollutants
EPA-450/4-90-003
March 1990

Procedures For The Preparation Of Emission Inventories For Carbon Monoxide And Precursors Of Ozone,
Volume I, General Guidance For Stationary Sources
EPA-450/4-91-016
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Procedures For The Preparation Of Emission Inventories For Carbon Monoxide And Precursors Of Ozone
Volume II Emission Inventory Requirements For Photo Chemical
Quality Simulation Models
EPA-450/4-91-014
May 1991

Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air
Quality Standards (NAAQS) and Regional Haze Regulations
EPA-454/R-99-006
April 1999

User's Guide for the Urban Airshed Model –
Volume IV: User's Manual for the Emissions Preprocessor system 2.0:
Part A, Core Fortran System. SYSAPP 90/018d

Utah Smoke Management Plan, Fourth Edition
July 20, 1999.

Interim Air Quality Policy on Wildland and Prescribed Fires
April 23, 1998

Emission Inventory Improvement Program
Office of Air Quality Planning and Standards, MD-14
EPA-454/R-97-004a

User's Guide to MOBILE6.1 and MOBILE6.2: Mobile Source Emission Factor Model
EPA420-R-02-028
October 2002

Technical Guidance on the Use of MOBILE6 for Emission Inventory Preparation
Office of Air and Radiation
Office of Transportation and Air Quality
January 2002

User's Guide to PART5: A Program for Calculating Particle Emissions from Motor Vehicles
Office of Mobile Sources
EPA-AA-AQAB-94-2
February 1995

Appendix: Particulate Emission Factors for Mobile Sources as Calculated in the Model PART5
Office of Mobile Sources

PART5 Information Sheet #3: Gaseous Sulfur Dioxide and Indirect Sulfate Emissions
U.S. EPA National Vehicle and Fuel Emissions Laboratory
February 1996

Salt Lake City 1993 CO Attainment Inventory

Area Sources	CO Emissions Tons/Winter Day
Agricultural Burning	n/d
Aircraft Maintenance	0.01
Coal Combustion-commercial	0.46
Coal Combustion-industrial	1.15
Coal Combustion-residential	0.02
Detonation	n/d
Firefighter Training	n/d
Forest Fires	n/d
Natural Gas Combustion-commercial & Industrial	1.49
Natural Gas Combustion-residential	0.88
Oil Combustion-commercial	0.04
Oil Combustion-residential	0.00
Open Burning	n/d
Orchard Heaters	n/d
Structural Fires	0.04
Vehicle Fires	0.01
Wood Combustion	11.25
<i>Total Area Sources</i>	<i>15.34</i>
Mobile Sources	
On-Road	295.21
Non-Road	
Aircraft	1.27
Railroad	0.18
Misc. Non--road Equipment	33.39
<i>Total non-road Mobile</i>	<i>34.84</i>
Point Sources	0.00 *
Total Salt Lake Emissions	345.39

Note: Numbers may vary slightly from report due to rounding
 Numbers may not add due to rounding

n/d = negative declaration

*There were no major CO point sources in the maintenance area in 1993.

Table 1: POPULATION (People)

County	1993
Beaver	5172
Box Elder	38314
Cache	77361
Carbon	19771
Daggett	734
Davis	205655
Duchesne	13131
Emery	10661
Garfield	4227
Grand	7582
Iron	23965
Juab	6204
Kane	5421
Millard	12189
Morgan	6043
Piute	1386
Rich	1869
Salt Lake	791724
San Juan	13056
Sanpete	18594
Sevier	16292
Summit	20221
Tooele	28423
Uintah	24277
Utah	292351
Wasatch	11300
Washington	61497
Wayne	2182
Weber	169791
TOTAL	1889393

Table 2:City Population (People)

City	1993
Salt Lake City	160233

Table 3:State Population (People)

State	1993
Utah	1889393

Utah Population Estimates Committee

Selection Criteria
Pop Component = Population

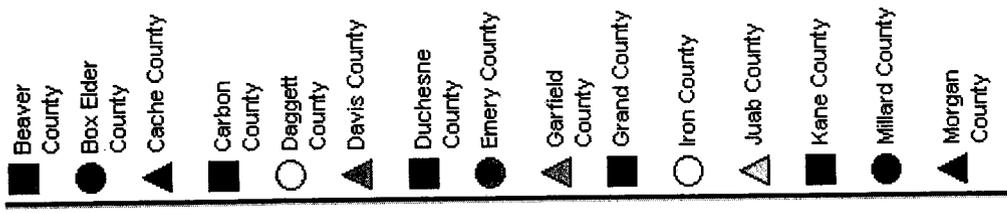
Components of Population Change

Rev. January 2004

Year	Area														
	Beaver County	Box Elder County	Cache County	Carbon County	Daggett County	Davis County	Duchesne County	Emery County	Garfield County	Grand County	Iron County	Juab County	Kane County	Millard County	Morgan County
1940	4,900	18,900	29,900	18,700	600	15,500	8,700	7,000	5,300	2,200	8,400	7,400	2,600	9,700	2,600
1941	5,100	18,400	30,100	17,800	700	16,800	8,900	6,900	5,000	2,000	8,300	7,100	2,500	9,100	2,600
1942	4,600	18,200	30,000	18,100	600	18,400	8,000	6,600	4,800	2,100	8,100	6,400	2,500	8,800	2,700
1943	3,900	18,300	29,200	19,100	400	23,800	7,600	6,000	4,300	2,000	7,700	5,700	2,400	9,300	3,000
1944	4,000	18,300	28,400	21,000	400	24,700	7,600	5,600	3,900	2,000	7,500	5,600	2,200	9,600	2,700
1945	4,200	18,200	28,200	22,600	400	24,000	7,300	5,300	4,000	2,100	7,300	5,500	2,100	9,800	2,500
1946	4,500	18,700	30,200	22,100	400	27,300	7,600	5,200	4,100	2,100	8,500	5,900	2,300	9,400	2,500
1947	4,600	19,600	31,000	20,700	300	27,500	7,600	5,200	4,000	2,000	9,000	5,800	2,300	8,700	2,500
1948	4,500	19,700	32,500	22,700	300	29,000	7,500	5,600	3,800	1,900	9,000	6,000	2,100	8,600	2,400
1949	4,600	20,200	33,500	24,000	300	29,600	7,900	5,800	4,000	2,000	9,500	6,000	2,300	8,900	2,500
1950	4,800	19,800	33,600	24,800	400	31,200	8,100	6,300	4,100	1,900	9,700	5,900	2,300	9,300	2,500
1951	4,600	19,800	33,500	24,400	400	34,600	8,000	6,100	4,000	2,000	9,700	5,800	2,300	9,200	2,500
1952	4,500	19,700	33,600	23,100	400	38,400	7,900	5,900	2,800	2,000	9,700	5,600	2,300	9,100	2,600
1953	4,400	19,700	33,700	23,000	400	41,300	7,800	5,800	3,700	2,100	9,800	5,500	2,300	9,000	2,600
1954	4,300	19,600	33,800	22,900	400	43,100	7,600	5,700	3,600	2,400	9,900	5,400	2,300	8,800	2,600
1955	4,400	19,900	34,500	22,800	400	45,800	7,600	5,700	3,700	4,000	10,100	5,300	2,400	8,800	2,600
1956	4,300	20,000	34,900	22,500	400	49,000	7,600	5,700	3,700	5,000	10,300	5,200	2,400	8,700	2,700

1957	4,300	20,900	34,900	22,400	400	52,700	7,500	5,700	3,700	5,200	10,300	5,000	2,500	8,500	2,700
1958	4,300	22,300	35,000	22,000	500	56,600	7,300	5,600	3,600	5,600	10,400	4,900	2,700	8,200	2,700
1959	4,300	23,800	35,400	21,800	1,000	60,400	7,300	5,600	3,600	6,000	10,600	4,700	2,700	8,000	2,700
1960	4,300	25,500	36,100	21,200	1,200	65,600	7,200	5,500	3,500	6,400	10,900	4,500	2,700	7,900	2,800
1961	4,300	28,900	37,400	20,400	1,300	70,100	7,200	5,500	3,500	8,100	11,200	4,500	2,700	8,100	3,000
1962	4,300	31,100	38,700	19,700	1,500	75,600	7,100	5,400	3,500	9,000	11,200	4,500	2,700	7,800	3,000
1963	4,200	31,300	39,400	18,700	1,700	80,000	7,000	5,400	3,400	8,500	10,700	4,600	2,700	7,500	3,000
1964	4,100	29,500	39,700	17,700	800	82,000	6,700	5,400	3,400	7,500	10,600	4,600	2,600	7,300	3,000
1965	4,100	28,000	40,000	17,300	700	86,000	6,500	5,400	3,400	6,900	10,700	4,600	2,600	7,100	3,200
1966	4,100	27,000	40,200	16,900	600	91,000	6,500	5,300	3,300	6,600	11,000	4,400	2,400	7,000	3,300
1967	4,000	26,400	40,600	16,800	600	93,000	6,700	5,200	3,100	6,700	11,300	4,400	2,400	7,000	3,400
1968	4,000	27,200	41,200	16,400	600	95,000	7,000	5,200	3,100	6,800	11,600	4,400	2,400	7,000	3,500
1969	3,900	27,600	41,800	16,100	600	97,000	7,100	5,100	3,100	6,800	11,900	4,500	2,400	7,000	3,800
1970	3,850	28,150	42,550	15,750	650	99,600	7,400	5,150	3,150	6,600	12,300	4,600	2,450	7,050	4,050
1971	3,850	28,450	43,150	16,650	650	107,800	8,500	5,600	3,100	6,550	13,300	4,600	2,800	7,150	4,050
1972	3,850	28,800	44,050	17,200	600	113,300	9,900	6,100	3,100	6,500	14,050	4,700	2,950	7,350	4,050
1973	3,850	29,200	45,350	17,550	600	116,600	11,000	6,700	3,050	6,450	14,200	4,800	3,150	7,400	4,200
1974	3,950	29,100	46,850	17,900	700	119,900	11,550	6,800	3,100	6,500	14,500	5,000	3,250	7,500	4,350
1975	3,900	29,900	48,100	18,750	800	123,900	11,500	7,600	3,200	6,900	14,950	4,950	3,350	7,900	4,350
1976	4,000	30,100	50,100	19,450	750	128,100	11,150	8,850	3,250	7,300	15,500	5,050	3,500	7,950	4,500
1977	4,150	30,800	51,700	20,150	700	133,200	11,400	9,700	3,350	7,650	16,000	5,150	3,750	8,050	4,600
1978	4,200	31,500	53,200	20,750	750	134,900	11,600	10,300	3,350	8,100	16,650	5,250	3,850	8,250	4,600
1979	4,350	32,350	54,800	21,350	750	142,400	11,850	11,000	3,450	7,950	17,050	5,400	3,800	8,550	4,800
1980	4,400	33,500	57,700	22,400	750	148,000	12,700	11,600	3,700	8,250	17,500	5,550	4,050	9,050	4,950
1981	4,600	33,800	59,400	23,000	850	153,000	13,100	12,000	3,700	8,400	18,100	5,600	4,050	9,450	5,000

1982	4,650	34,200	61,200	24,300	850	158,000	13,700	12,700	3,750	8,150	18,600	5,700	4,200	10,100	5,100
1983	5,000	34,700	63,500	24,100	750	162,000	14,400	12,700	3,900	8,050	19,500	5,950	4,500	10,800	5,100
1984	5,150	34,900	64,300	23,100	750	166,000	14,800	11,900	3,900	7,750	20,000	6,200	4,700	12,400	5,150
1985	5,050	35,500	65,200	22,800	700	170,000	14,700	11,100	4,000	7,200	20,100	6,300	4,950	12,900	5,250
1986	4,950	36,000	66,300	22,300	700	175,000	14,300	11,100	4,000	7,050	20,300	5,900	5,100	12,200	5,250
1987	4,900	36,300	67,500	21,700	700	179,000	13,700	10,900	4,000	6,900	20,300	5,800	5,150	11,400	5,350
1988	4,800	36,300	68,500	21,100	700	184,000	13,100	10,500	3,950	6,750	20,100	5,800	5,250	11,300	5,350
1989	4,800	36,500	69,200	20,400	650	186,000	12,800	10,400	4,000	6,700	20,400	5,900	5,250	11,300	5,450
1990	4,782	36,509	70,560	20,169	706	188,471	12,600	10,329	3,970	6,591	20,910	5,831	5,150	11,333	5,561
1991	4,946	37,197	72,586	20,186	732	195,088	12,825	10,262	4,092	6,789	21,715	6,060	5,262	11,703	5,629
1992	5,044	37,669	75,441	20,361	739	201,158	12,895	10,298	4,117	7,186	22,410	6,191	5,325	11,907	5,805
1993	5,172	38,314	77,361	19,771	734	205,655	13,131	10,661	4,227	7,582	23,965	6,204	5,421	12,189	6,043
1994	5,402	38,760	79,530	20,119	767	212,151	13,414	10,620	4,244	7,776	25,296	6,860	5,659	12,246	6,271
1995	5,672	39,260	82,095	19,965	794	216,054	13,501	10,683	4,361	7,822	27,506	7,236	5,844	12,266	6,416
1996	5,858	39,907	83,834	20,286	787	219,685	13,973	11,056	4,451	8,146	28,858	7,496	5,908	12,194	6,633
1997	5,870	40,735	85,974	20,654	786	224,356	14,332	11,089	4,603	8,170	30,254	7,735	5,982	12,243	6,705
1998	5,705	41,507	88,326	20,695	783	229,450	14,177	11,059	4,570	8,197	31,687	7,898	6,012	12,246	6,889
1999	5,951	42,399	89,874	20,500	884	235,364	14,293	11,095	4,650	8,329	32,879	8,021	6,073	12,236	6,973
2000	6,023	42,860	91,897	20,396	933	240,204	14,397	10,782	4,763	8,537	34,079	8,310	6,037	12,461	7,181
2001	6,198	43,245	93,372	19,858	944	244,845	14,646	10,473	4,630	8,423	34,920	8,570	6,037	12,326	7,297
2002	6,285	43,812	95,460	19,858	916	250,265	14,856	10,540	4,599	8,468	35,507	8,643	5,958	12,335	7,416
2003	6,285	44,022	98,176	19,558	921	256,554	14,698	10,477	4,532	8,464	36,310	8,713	5,937	12,200	7,532



- Population estimates for July 1 were produced by the Utah Population Estimates Committee (UPEC).
- UPEC changed its rounding convention. Estimates before 1990 are rounded while those for 1990 and beyond are not rounded.
- Birth and death data from the Utah Department of Health, Office of Vital Records and Statistics.
- Birth and death certificates held in the Utah Population Database, partially funded by the Huntsman Cancer Institute.



For questions about Population Estimates, contact **Robert Spendlove**

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Utah Population Estimates Committee

Selection Criteria
Pop Component = Population

Components of Population Change

Rev. January 2004

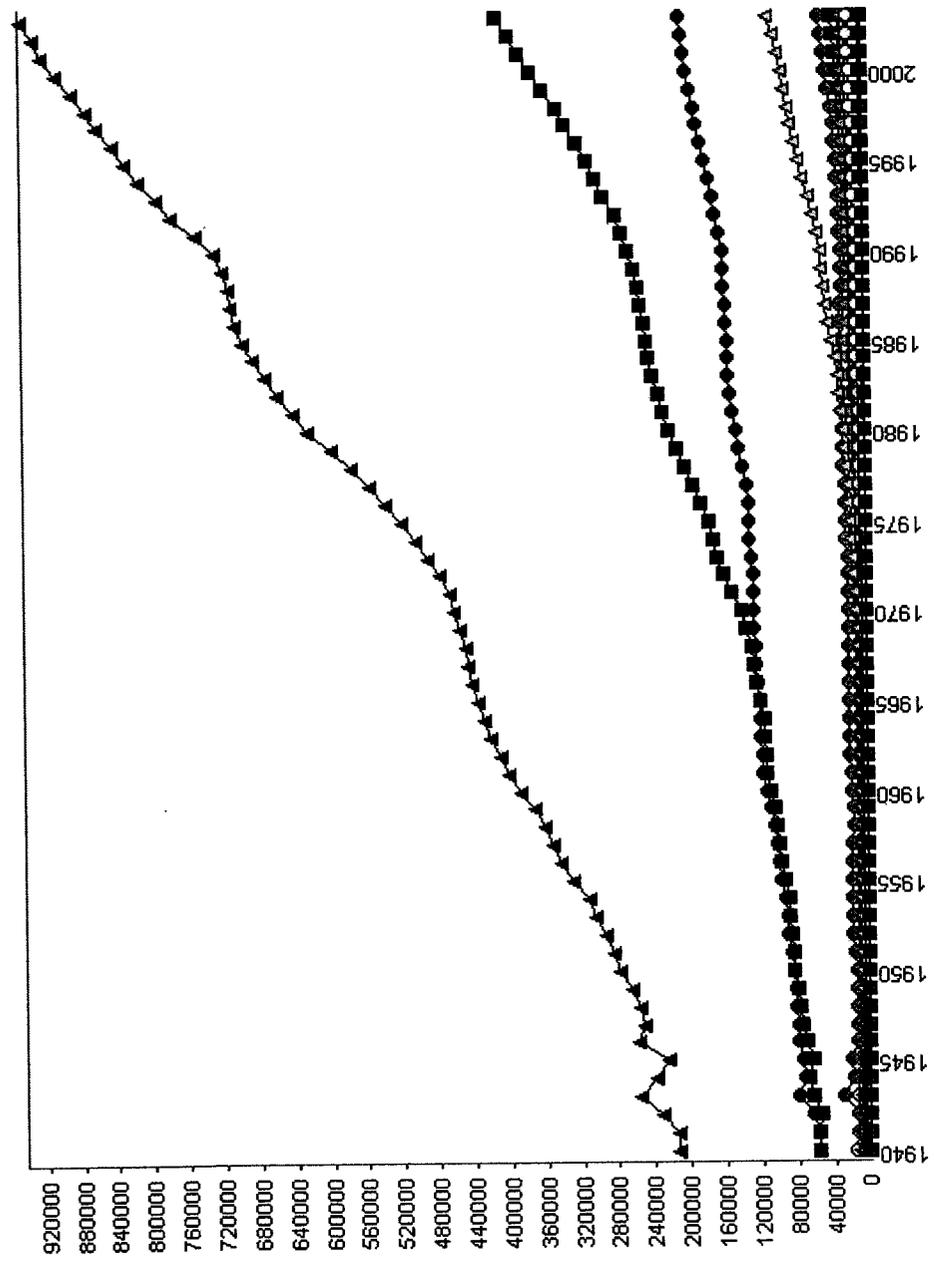
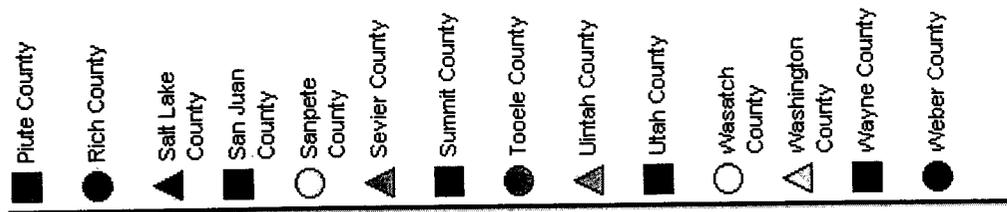
Year	Area														Weber County
	Piute County	Rich County	Salt Lake County	San Juan County	Sanpete County	Sevier County	Summit County	Tooele County	Uintah County	Utah County	Wasatch County	Washington County	Wayne County		
1940	2,200	2,000	213,700	4,600	15,900	12,300	8,600	8,800	10,000	56,900	5,800	9,200	2,300	57,100	
1941	2,200	2,300	213,900	4,600	15,300	11,800	8,500	9,300	9,500	56,300	5,800	9,700	2,400	58,100	
1942	2,000	2,000	232,200	4,600	14,200	11,300	8,300	14,300	9,300	55,900	5,800	5,600	2,100	63,700	
1943	2,000	1,900	257,200	4,600	13,500	10,400	7,700	30,900	8,200	64,700	5,800	8,600	1,900	79,900	
1944	2,000	2,000	238,000	4,300	13,500	10,000	7,000	19,700	7,400	68,200	5,600	8,100	2,000	73,400	
1945	1,800	1,900	226,000	3,500	13,000	10,300	6,200	20,900	7,400	63,900	5,300	8,300	1,900	75,200	
1946	1,800	1,700	259,300	3,700	14,000	11,400	6,600	13,800	8,800	71,300	5,800	8,700	1,900	78,400	
1947	1,900	1,400	252,400	3,800	13,800	11,700	6,900	13,100	9,600	75,800	5,900	8,700	1,700	78,500	
1948	2,000	1,300	257,400	3,700	14,000	12,300	7,000	14,400	10,300	78,000	5,700	8,700	1,900	80,700	
1949	2,000	1,600	265,000	4,900	13,900	12,300	6,800	14,900	10,500	79,000	5,800	9,800	2,100	81,100	
1950	1,900	1,700	279,000	5,300	13,800	12,000	6,700	15,000	10,300	83,000	5,500	9,800	2,200	85,000	
1951	1,900	1,700	285,600	5,100	13,400	11,700	6,500	16,100	10,000	83,000	5,400	9,700	2,100	87,000	
1952	1,800	1,700	295,500	5,000	12,900	11,500	6,400	18,000	10,200	85,700	5,400	9,600	2,100	89,600	
1953	1,800	1,700	305,000	5,000	12,500	11,300	6,300	18,000	10,300	87,600	5,400	9,600	2,000	91,500	
1954	1,700	1,700	312,200	5,000	12,500	11,100	6,100	18,000	10,300	89,500	5,300	9,700	2,000	93,000	
1955	1,700	1,700	330,200	6,000	12,300	11,200	6,100	18,100	10,600	93,000	5,400	10,000	2,000	96,500	
1956	1,700	1,700	343,200	6,900	12,000	11,100	6,000	18,200	10,900	97,000	5,400	10,200	2,000	100,100	

State of Utah Economic and Demographic Research Database

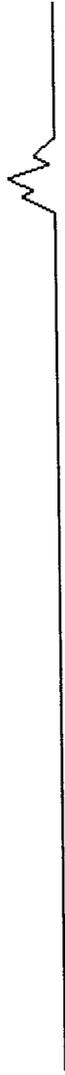
1957	1,600	1,700	352,100	7,800	11,400	10,700	5,900	18,000	10,900	100,000	5,400	10,200	1,900	102,000
1958	1,500	1,700	362,100	8,600	11,000	10,600	5,800	17,900	11,100	101,700	5,300	10,200	1,800	104,200
1959	1,500	1,700	373,600	9,300	11,000	10,500	5,700	17,900	11,300	104,300	5,300	10,400	1,700	107,800
1960	1,400	1,700	387,800	8,900	11,100	10,600	5,700	18,000	11,700	108,300	5,300	10,400	1,700	112,100
1961	1,500	1,700	402,300	8,700	11,100	10,500	5,700	19,100	12,400	112,200	5,400	10,500	1,700	117,000
1962	1,500	1,700	411,800	7,900	11,000	10,400	5,600	20,500	12,800	113,600	5,400	10,400	1,700	118,600
1963	1,400	1,700	423,100	7,600	10,900	10,100	5,600	21,300	13,000	114,500	5,400	10,300	1,700	119,300
1964	1,400	1,600	429,800	7,800	10,800	9,900	5,600	21,300	12,800	114,800	5,600	10,400	1,600	119,700
1965	1,400	1,600	436,000	7,900	10,700	9,800	5,700	21,000	12,800	119,000	5,600	10,600	1,600	120,800
1966	1,300	1,600	443,000	8,500	10,600	9,600	5,800	21,000	12,600	124,600	5,700	11,000	1,600	122,500
1967	1,300	1,600	447,000	8,900	10,700	9,600	5,800	21,600	12,500	126,000	5,800	11,600	1,500	123,500
1968	1,300	1,600	449,000	8,900	10,800	9,800	5,900	21,800	12,400	128,000	5,800	12,300	1,500	124,500
1969	1,300	1,600	455,000	9,300	10,900	9,900	5,900	21,600	12,800	134,600	5,800	13,000	1,500	125,500
1970	1,150	1,600	461,500	9,700	11,000	10,150	5,900	21,600	12,800	139,300	5,950	13,900	1,450	126,700
1971	1,150	1,550	467,300	9,600	11,250	10,850	6,400	21,700	14,100	151,000	6,350	15,100	1,500	127,100
1972	1,150	1,550	477,100	9,850	11,400	11,350	6,900	21,800	15,250	160,400	6,650	16,150	1,450	127,600
1973	1,200	1,550	491,800	10,050	11,850	11,750	7,050	22,150	16,050	166,100	6,700	17,600	1,500	129,500
1974	1,200	1,650	504,500	10,350	11,900	11,950	7,300	22,650	16,950	171,100	6,650	18,150	1,550	130,100
1975	1,250	1,700	521,200	10,700	12,150	12,550	7,500	23,150	17,350	176,800	7,000	19,000	1,600	131,900
1976	1,200	1,700	539,400	10,750	12,500	13,050	7,850	23,550	17,500	184,700	7,200	20,250	1,650	131,200
1977	1,200	1,850	556,000	11,350	13,050	13,400	8,450	24,250	18,450	193,700	7,550	21,550	1,700	133,100
1978	1,250	1,800	576,600	11,800	13,650	14,000	8,950	24,850	19,000	203,100	7,850	23,050	1,800	138,800
1979	1,250	2,050	599,100	12,150	14,050	14,450	9,500	25,450	19,800	211,500	8,000	25,000	1,900	141,900
1980	1,350	2,150	625,000	12,400	14,800	14,900	10,400	26,200	20,700	220,000	8,650	26,400	1,950	145,000
1981	1,350	2,250	641,000	12,600	15,200	15,100	11,100	26,500	22,100	227,000	8,850	27,900	2,000	148,000

State of Utah Economic and Demographic Research Database

1982	1,250	2,350	659,000	12,500	15,800	15,300	11,600	26,700	24,800	232,000	8,700	29,800	2,000	151,000
1983	1,300	2,250	673,000	12,900	16,400	15,600	12,200	26,800	26,000	238,000	9,100	31,300	2,200	153,000
1984	1,300	2,100	686,000	12,600	16,400	15,800	12,800	27,100	25,200	243,000	9,200	33,300	2,200	154,000
1985	1,300	2,050	697,000	12,300	16,300	15,900	13,000	27,300	24,900	245,000	9,200	36,800	2,200	154,000
1986	1,300	2,000	706,000	12,400	15,800	15,300	13,400	27,000	24,000	247,000	9,450	40,700	2,200	156,000
1987	1,300	1,850	710,000	12,600	15,900	15,400	14,200	27,100	23,000	252,000	9,700	43,200	2,150	156,000
1988	1,300	1,750	713,000	12,600	16,000	15,400	14,300	26,500	22,700	255,000	9,750	45,000	2,200	157,000
1989	1,300	1,750	720,000	12,600	16,000	15,400	15,100	26,500	22,200	258,000	10,000	47,200	2,200	158,000
1990	1,267	1,728	728,298	12,448	16,355	15,434	15,690	26,581	22,230	265,766	10,134	48,988	2,163	158,673
1991	1,295	1,721	749,878	12,668	16,840	15,627	17,051	27,121	22,977	272,167	10,825	53,693	2,183	161,752
1992	1,312	1,765	775,306	12,963	17,804	15,923	18,546	27,930	23,820	279,635	10,890	57,195	2,124	166,390
1993	1,386	1,869	791,724	13,056	18,594	16,292	20,221	28,423	24,277	292,351	11,300	61,497	2,182	169,791
1994	1,360	1,902	812,053	13,730	19,291	16,572	21,863	29,840	24,581	300,447	11,955	67,753	2,286	173,973
1995	1,331	1,840	827,342	13,796	19,990	16,936	23,632	30,179	24,518	310,334	12,576	72,910	2,275	178,094
1996	1,371	1,897	840,649	14,008	20,898	17,258	25,051	31,433	24,636	321,072	13,075	78,023	2,361	182,089
1997	1,328	1,882	858,306	14,392	21,825	17,902	26,224	33,457	25,163	334,658	13,307	82,078	2,406	186,993
1998	1,372	1,889	870,735	14,779	22,445	18,294	27,674	35,476	24,262	344,820	14,132	84,579	2,421	189,553
1999	1,433	1,978	885,216	14,573	22,513	18,555	28,799	38,294	25,004	358,463	14,560	88,105	2,492	193,508
2000	1,436	1,955	902,777	14,360	22,846	18,938	30,048	41,549	25,297	371,894	15,433	91,104	2,515	197,541
2001	1,404	1,983	918,279	14,063	23,219	19,180	31,279	44,431	26,049	385,692	15,947	95,584	2,509	200,567
2002	1,409	2,050	927,564	14,216	23,550	19,232	32,236	46,208	25,984	398,056	16,847	100,611	2,504	203,377
2003	1,358	2,079	940,465	14,240	23,391	19,318	34,073	47,832	26,019	410,768	17,368	105,702	2,487	205,882



- Population estimates for July 1 were produced by the Utah Population Estimates Committee (UPEC).
- UPEC changed its rounding convention. Estimates before 1990 are rounded while those for 1990 and beyond are not rounded.
- Birth and death data from the Utah Department of Health, Office of Vital Records and Statistics.
- Birth and death certificates held in the Utah Population Database, partially funded by the Huntsman Cancer Institute.



For questions about Population Estimates, contact Robert Spendlove

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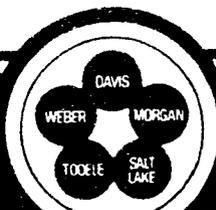
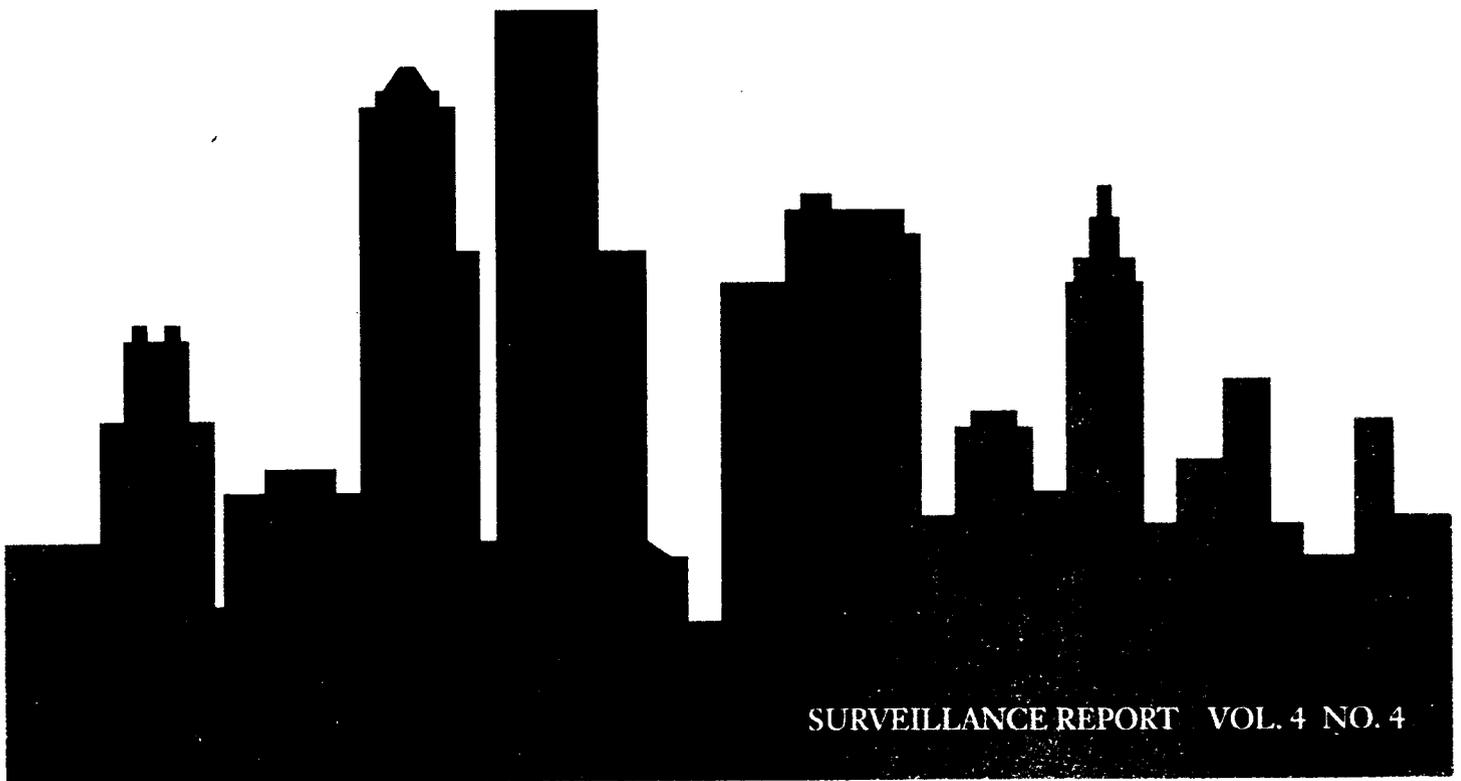
SURVEILLANCE OF SOCIO-ECONOMIC CHARACTERISTICS

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Air Quality

1993 SUPPLEMENT



WASATCH FRONT REGIONAL COUNCIL

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SOCIO ECONOMIC CHARACTERISTICS 1993 WASATCH FRONT REGIONAL COUNCIL SALT LAKE--OGDEN MSA

1993	MULTI		TOTAL	TOTAL		INDUS	1990	POP/ CARS/	POP/ CARS/	
	TOTAL FAMILY	DWELL DWELL		NON AG	& CONST					TRIAL	AVG.	DU	DU
	ING	ING	CARS	EMPTY	EMPTY	EMPTY	HH			
	POP	UNITS	(1)				INCOME			
		UNITS					(2)			
CITY*										
BLUFFDALE	2917	744	55	1911	232	6	142	\$42,412	3.92	2.57
DRAPER	11930	2784	492	6185	3926	758	1102	\$43,575	4.29	2.22
MIDVALE	10978	4545	2415	6968	8497	1510	1801	\$24,550	2.42	1.53
MURRAY	36052	14172	5860	26009	27416	8015	4301	\$35,422	2.54	1.84
RIVERTON	14789	3706	151	8707	1082	410	25	\$39,281	3.99	2.35
SALT LAKE OTHER	158674	72710	34740	106636	154193	17658	38559	\$31,654	2.18	1.47
SALT LAKE (CBD)	1559	944	903	845	48414	6207	7111	\$38,438	1.65	0.90
SANDY	87966	23940	2938	54681	17001	4719	2765	\$49,431	3.67	2.28
SOUTH JORDAN	18953	4478	117	10725	1540	160	517	\$46,974	4.23	2.40
SOUTH SALT LAKE	10688	5072	2612	7374	21609	4417	5198	\$22,702	2.11	1.45
WEST JORDAN	55705	15052	2783	31535	9833	2535	2909	\$36,548	3.70	2.10
WEST VALLEY	90917	28765	8711	56613	37748	7038	13310	\$31,669	3.16	1.97
UNINCORPORATED	276243	94108	23966	186530	75511	18000	8037	\$39,715	2.94	1.98

*All City And Community Boundaries Follow Existing Traffic Zone Boundaries And Are Therefore Approximations Only. Where Actual City Boundaries Bisect A Traffic Zone, The City Or Community With The Largest Bisected Area Will Contain 100% Of The Data.

CBD - City Business District.



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DEA - Utah Population Estimates Committee - UPEC

UPEC Home Page

The Utah Population Estimates Committee prepares the official state and county population estimates for the State of Utah. Under special circumstances, it also prepares selected sub-county estimates for the state.

The U.S. Bureau of the Census is the only source for statewide sub-county estimates and age, race, and sex estimates. The U.S. Census Population Estimates Program publishes state population estimates each year for total population with details on age, sex, race and Hispanic origin. The first release of total population estimates at the end of the calendar year includes demographic components of change (births, deaths, and migration). Later releases include population data by age, sex, race, and Hispanic origin and give numbers for single year of age, different age groupings, and median age. These data are estimates of the population of the 50 states and the District of Columbia as of July 1 of each year.

Documentation

Background

The Utah Population Estimates Committee prepares population estimates to improve state planning. The Committee has a long history within the state; it was originally referred to as the Utah Population Work Committee and housed within what was then called the Utah Department of Employment Security. For over a decade the Committee has been housed within and staffed by the Governor's Office of Planning and Budget. While the Committee has prepared estimates for many years, it was formally established by executive order in September 1997.

- UPEC History - Historic Review of the Utah Population Estimates Committee - Population Estimates: The Utah Experience - Paper by Natalie Gochnour, Chairperson, UPEC
- UPEC Executive Order
- Governor's Executive Orders and Proclamations

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Utah Population Estimates Committee
State of Utah Population Estimates, Net Migration, Births and Deaths

Year	July 1st Population*	Percent Change	Increase	Net Migration	Net Migration as a Percent of Previous Year's Population	Natural Increase	Fiscal Year Births	Fiscal Year Deaths
1940	551,800	---	---	---	---	8,419	13,038	4,619
1941	551,000	-0.1%	-800	-9,631	-1.7%	8,831	13,293	4,462
1942	571,200	3.7%	20,200	10,231	1.8%	9,969	14,357	4,388
1943	640,000	12.0%	68,800	57,284	9.0%	11,516	16,182	4,666
1944	604,700	-5.5%	-35,300	-47,122	-7.8%	11,822	16,536	4,714
1945	589,100	-2.6%	-15,600	-26,992	-4.6%	11,392	15,937	4,545
1946	638,000	8.3%	48,900	36,649	5.7%	12,251	16,955	4,704
1947	636,000	-0.3%	-2,000	-19,178	-3.0%	17,178	21,905	4,727
1948	653,000	2.7%	17,000	943	0.1%	16,057	20,856	4,799
1949	670,800	2.7%	17,800	2,207	0.3%	15,593	20,354	4,761
1950	695,900	3.7%	25,100	8,966	1.3%	16,134	21,027	4,893
1951	706,100	1.5%	10,200	-6,842	-1.0%	17,042	21,801	4,759
1952	723,000	2.4%	16,900	-1,160	-0.2%	18,060	23,116	5,056
1953	739,100	2.2%	16,100	-2,789	-0.4%	18,889	23,573	4,684
1954	750,500	1.5%	11,400	-7,069	-0.9%	18,469	23,439	4,970
1955	782,800	4.3%	32,300	12,784	1.6%	19,516	24,584	5,068
1956	808,800	3.3%	26,000	6,348	0.8%	19,652	24,975	5,323
1957	826,300	2.2%	17,500	-2,639	-0.3%	20,139	25,443	5,304
1958	845,200	2.3%	18,900	-955	-0.1%	19,855	25,760	5,905
1959	869,900	2.9%	24,700	4,959	0.6%	19,741	25,610	5,869
1960	900,000	3.5%	30,100	10,047	1.1%	20,053	26,011	5,958
1961	936,000	4.0%	36,000	15,371	1.6%	20,629	26,560	5,931
1962	958,000	2.4%	22,000	1,817	0.2%	20,183	26,431	6,248
1963	974,000	1.7%	16,000	-3,317	-0.3%	19,317	25,648	6,331
1964	978,000	0.4%	4,000	-13,863	-1.4%	17,863	24,461	6,598
1965	991,000	1.3%	13,000	-3,553	-0.4%	16,553	23,082	6,529
1966	1,009,000	1.8%	18,000	2,810	0.3%	15,190	21,953	6,763
1967	1,019,000	1.0%	10,000	-6,350	-0.6%	16,350	23,030	6,680
1968	1,029,000	1.0%	10,000	-6,029	-0.6%	16,029	22,743	6,714
1969	1,047,000	1.7%	18,000	798	0.1%	17,202	24,033	6,831
1970	1,066,000	1.8%	19,000	612	0.1%	18,388	25,281	6,893
1971	1,101,150	3.3%	35,150	14,966	1.4%	20,184	27,400	7,216
1972	1,135,100	3.1%	33,950	14,046	1.2%	19,904	27,146	7,242
1973	1,168,950	3.0%	33,850	13,810	1.2%	20,040	27,562	7,522
1974	1,196,950	2.4%	28,000	6,621	0.6%	21,379	28,876	7,497
1975	1,233,900	3.1%	36,950	13,897	1.1%	23,053	30,566	7,513
1976	1,272,050	3.1%	38,150	11,761	0.9%	26,389	33,773	7,384
1977	1,315,950	3.5%	43,900	14,824	1.1%	29,076	36,707	7,631
1978	1,363,750	3.6%	47,800	17,220	1.3%	30,580	38,289	7,709
1979	1,415,950	3.8%	52,200	19,868	1.4%	32,332	40,216	7,884
1980	1,474,000	4.1%	58,050	24,536	1.7%	33,514	41,645	8,131
1981	1,515,000	2.8%	41,000	7,612	0.5%	33,388	41,509	8,121
1982	1,558,000	2.8%	43,000	9,662	0.6%	33,338	41,773	8,435
1983	1,595,000	2.4%	37,000	4,914	0.3%	32,086	40,555	8,469
1984	1,622,000	1.7%	27,000	-2,793	-0.2%	29,793	38,643	8,850
1985	1,643,000	1.3%	21,000	-7,714	-0.5%	28,714	37,664	8,950
1986	1,663,000	1.2%	20,000	-8,408	-0.5%	28,408	37,309	8,901
1987	1,678,000	0.9%	15,000	-11,713	-0.7%	26,713	35,631	8,918
1988	1,690,000	0.7%	12,000	-14,557	-0.9%	26,557	35,809	9,252

Governor's Office of Planning & Budget
UPEC

Utah Population Estimates Committee
State of Utah Population Estimates, Net Migration, Births and Deaths

Year	July 1st Population*	Percent Change	Increase	Net Migration	Net Migration as a Percent of Previous Year's Population	Natural Increase	Fiscal Year Births	Fiscal Year Deaths
1989	1,706,000	0.9%	16,000	-10,355	-0.6%	26,355	35,439	9,084
1990	1,729,227	1.4%	23,227	-3,480	-0.2%	26,707	35,830	9,123
1991	1,780,870	3.0%	51,643	24,878	1.4%	26,765	36,194	9,429
1992	1,838,149	3.2%	57,279	30,042	1.6%	27,237	36,796	9,559
1993	1,889,393	2.8%	51,244	24,561	1.3%	26,683	36,738	10,055
1994	1,946,721	3.0%	57,328	30,116	1.5%	27,212	37,623	10,411
1995	1,995,228	2.5%	48,507	20,024	1.0%	28,483	39,064	10,581
1996	2,042,893	2.4%	47,665	18,171	0.9%	29,494	40,495	11,001
1997	2,099,409	2.8%	56,516	25,253	1.2%	31,263	42,512	11,249
1998	2,141,632	2.0%	42,223	9,745	0.5%	32,478	44,126	11,648
1999	2,193,014	2.4%	51,382	17,584	0.8%	33,798	45,434	11,636
2000	2,246,553	2.4%	53,539	18,612	0.8%	34,927	46,880	11,953
2001	2,295,971	2.2%	49,418	14,167	0.6%	35,251	47,688	12,437
2002	2,338,761	1.9%	42,790	7,411	0.3%	35,379	48,041	12,662
2003	2,385,358	2.0%	46,597	9,877	0.4%	36,720	49,518	12,798

Note: In 1996, the Utah Population Estimates Committee changed its convention on rounded estimates so that it now publishes unrounded estimates. Accordingly, the revised estimates for 1990 and thereafter are not rounded.

Sources:

- 1) Utah Population Estimates Committee
- 2) Utah Office of Vital Records and Statistics
- 3) Utah Population Database, partially funded by the Huntsman Cancer Institute

AGRICULTURAL BURNING

NEGATIVE DECLARATION

Agricultural burning is done in early spring. It is not done during November, December, or January (CO winter season). Therefore, seasonal CO emissions from agricultural burning are declared as negative.

AIRCRAFT MAINTENANCE

A. Calculation of Annual Emissions

Emissions from aircraft testing, tuning, and repair are estimated to be 1 percent of the airport landing and takeoff (LTO) emissions. The following paragraphs show how the 1 percent figure was determined.

$$(\text{LTO emissions in tons/yr}) * (1\%) = \text{aircraft maintenance emissions tons/yr}$$

Justification for 1 Percent Emission Factor

Periodically, aircraft engines must be tuned to minimize engine wear and maintain flight safety. Large airlines have their own teams of resident mechanics while small fleet and individual plane owners hire the services of a fixed base operator (FBO) for repair services. These FBOs conduct business similar to a typical automobile repair shop. Fees are set by the hour of repair time or by the category of a particular repair service. Records of moderate detail are kept by airlines of the maintenance history of each plane within their fleet, but individual FBOs do not keep such records on the many individually-owned planes brought to them for service. Private owners may or may not keep a log of their repair history. Furthermore, collecting details of one-by-one repair histories would be difficult to determine. For these reasons, a link between total LTO cycles and aircraft maintenance trends will be established. Airline and FBOs were interviewed to establish this link.

The Utah Division of Air Quality conducted four surveys by mail and two interviews by telephone to understand the breadth of repair activities. This correspondence revealed that emissions of CO will only occur during idling and flight simulation tests; commonly called engine-run tests. Agencies completing the mail-in surveys identified the number of engine-run tests and the number of minutes of each test as identified by time period brackets.

It was found that the upper end of the time period results in a conservatively high estimate of engine-run testing time. Comparing the engine-run testing time to the minutes of operating time of landing and takeoffs shows an increase of 0.7 percent of emissions from the engine-run testing.

If this process were repeated for small private or military planes, maintenance trends may differ from the 0.7 percent. These other plane groupings may increase or decrease the 0.7 percent estimate. Acknowledging that the emission from aircraft maintenance is relatively small, a decision was made to simplify this category as much as possible and apply a constant 1 percent to all LTOs at all airports throughout Utah.

B. Calculation of typical CO Winter-day Emissions

The 1 percent factor is applied to the daily emissions from LTOs to determine the daily emissions from aircraft maintenance.

$(\text{LTO emissions in tons/day}) * (1\%) = \text{aircraft maintenance emissions tons/day}$

C. References

1. Procedures for Emission Inventory Preparation Volume IV: Mobile Sources EPA-450/4-81-026d (Revised)
2. Wasatch Front Regional Council
3. Emery/Airborne Express, local maintenance representative, Wayne Witt (801) 596-2724
4. UPS, Louisville, KY, maintenance representative, Jack (502) 359-7000
5. Office of Certification and Airworthiness, Commercial Engine Business, United Technologies Pratt and Whitney, 400 Main Street, East Hartford, Connecticut 06108, (203) 565-2269

Table III-5

Air Traffic and Activity - Salt Lake City International Airport

1988-1993

(Source: Salt Lake City Airport Authority)

	1988	1989	1990	1991	1992	1993	% Chg.	% Chg.	% Chg.	% Chg.	% Chg.
Total Passengers											
Scheduled Airlines and Charters											
Enplaned	5,366,612	5,927,881	5,967,730	6,213,018	6,920,374	7,911,925	+2.51	+4.11	+11.39	+11.39	+14.33
Deplaned	5,041,621	5,970,266	6,014,516	6,264,908	6,930,235	7,282,472	+2.29	+4.16	+10.94	+10.94	+14.85
Total	10,408,233	11,898,147	11,982,246	12,477,926	13,870,609	15,194,397	+2.00	+4.14	+11.6	+11.6	+14.59
Air Mail (Lbs.)											
Enplaned	32,666,224	34,899,157	42,969,465	59,985,147	56,673,030	56,960,362	-3.73	+39.60	-5.53	-5.53	+0.51
Deplaned	37,330,079	40,423,619	45,282,516	64,003,204	63,030,311	64,375,114	-10.66	+41.31	-1.53	-1.53	+2.45
Total	69,996,303	75,322,776	88,251,981	123,988,351	119,703,341	121,335,476	-7.55	+40.49	-3.16	-3.16	+1.53
Air Cargo (Lbs.)											
Enplaned	75,333,209	79,429,996	92,678,504	90,797,340	131,342,007	152,688,085	+4.65	-0.79	+44.66	+44.66	+16.12
Deplaned	72,348,620	58,441,702	74,294,136	76,586,380	102,591,700	122,765,203	-16.73	+5.46	+33.96	+33.96	+19.66
Total	147,681,829	137,871,698	166,972,640	167,383,720	233,933,707	275,453,288	-7.04	+1.98	+39.76	+39.76	+17.67
Aircraft Operations											
Air Carrier	146,336	148,828	150,758	155,485	162,095	173,942	+0.50	+3.14	+1.25	+1.25	+7.31
Air Taxi	56,146	57,238	60,367	62,167	68,410	69,481	+10.68	+2.98	+10.04	+10.04	+1.57
General Aviation	81,072	84,775	87,097	79,353	84,681	82,076	-7.81	-8.89	+6.72	+6.72	-3.08
Military	6,771	5,345	5,130	4,652	5,229	4,568	+2.93	-9.32	+12.40	+12.40	-12.64
Total	290,325	296,186	303,352	301,657	320,418	330,067	-0.19	-0.56	+6.22	+6.22	+3.01
1991 SI, CIA Revised Operations Percent (* = actual tower count)											
Air Carrier	+146,336	+148,828	+150,758	+156,700	+159,800	+163,000	+0.50	+3.95	+3.98	+3.98	+2.01
Total	+290,325	+296,186	+303,352	+304,060	+309,100	+314,000	-0.19	+2.42	+1.66	+1.66	+1.59

COAL COMBUSTION

A. Calculation of Annual Emissions

The Utah Energy Statistical Abstract published annually by the Utah Energy Office, lists 16,063,000 tons of coal consumed in the state of Utah in 1993: 15,942,000 tons by industrial sources and 121,000 tons by residential and commercial sources. (Industrial sources are the sum of electric utilities, coke plants, and other industrial sources.)

Questar Corporation identified the major communities that have access to piped natural gas in the state. The population distribution ratio was determined by dividing the county population by the total state population. It was assumed that the per-capita consumption of coal in areas that have access to natural gas is one-fiftieth (1/50) of the per-capita consumption of coal in areas without natural gas. This 1-to-50 ratio is simply a best estimate. The urban adjustment ratio was calculated by dividing the population distribution ratio by 50 in the Wasatch counties including Salt Lake County. The coal distribution ratio was found by dividing each urban adjustment ratio by the total amount of urban adjustment ratios in the state.

The amount of coal consumed in Salt Lake City maintenance area was then determined by multiplying the amount of coal consumed in the entire state by the coal distribution ratio and the ratio of population in Salt Lake County and Salt Lake City. There are 160,233 city residents and 791,724 county residents.

It was assumed that the percent of consumption of coal in the winter was equal to the percent of consumption of natural gas in the winter. Questar reported this fraction to be 38.8 percent. There were 92 days in the winter season.

The Statistical Abstract does not divide the coal consumed by residential sources from commercial sources, therefore the assumption was made that commercial and residential sources account for 95 percent and 5 percent respectively. Since the emission factors for residential and commercial consumption are each 275 pounds of CO per ton of coal burned, any error in this assumption has no effect on the collective CO emissions.

Salt Lake City Residential Coal Combustion

$(5\%) * (4173.664) * (160,233/791,724) = 42.23$ tons of coal consumed

$(42.23 \text{ tons coal consumed}) * (275 \text{ lbs CO/ton coal}) * (1 \text{ ton}/2000 \text{ lbs}) = 5.81$ tons CO/yr

Salt Lake City Commercial Coal Combustion

$(95\%) * (4173.664 \text{ tons of coal}) * (160,233/791,724) = 802.45$ tons of coal consumed

$(802.4523 \text{ tons coal consumed}) * (275 \text{ lbs CO/ton coal}) * (1 \text{ ton}/2000 \text{ lbs}) = 110.34$ tons CO/yr

$(802.4523 \text{ tons coal consumed}) * (275 \text{ lbs CO/ton coal}) * (1 \text{ ton}/2000 \text{ lbs}) = 110.3372 \text{ tons CO/yr}$

Salt Lake City Industrial Coal Combustion

$(549889 \text{ tons coal burned} * 5/2000 = 1374.72 \text{ tons CO in Salt Lake County}$

$(1374.72 \text{ tons CO}) * (160233/791,724) = 278.22 \text{ tons CO/yr}$

Calculations of Typical CO Winter-day Emissions

Residential Coal Combustion

$(42.2343 \text{ annual tons of coal consumed}) * (38\% \text{ during CO season}) * (1/92) = 0.17 \text{ tons of coal consumed daily}$

$(0.1744 \text{ tons coal daily}) * (275 \text{ lbs CO/ton coal}) * (1 \text{ ton}/2000 \text{ lbs}) = 0.024 \text{ tons of CO/season day}$

Commercial Coal Combustion

$(802.4523 \text{ annual tons of coal consumed}) * (38\% \text{ during CO season}) * (1/92) = 3.31 \text{ tons of coal consumed daily.}$

$(3.3145 \text{ tons of coal daily}) * (275 \text{ lbs CO/ton coal}) * (1 \text{ ton}/2000 \text{ lbs}) = 0.46 \text{ tons CO/season day}$

Industrial Coal Combustion

$(278.22 \text{ CO Salt Lake City}) * (38\% \text{ during CO season}) * (1/92) = 1.15 \text{ tons/season day}$

C. References

1. "Emission Inventory Improvement Program (EIIP)," Vol. III, Area Source Category Method Abstract Coal Combustion, dated 4/6/99
2. "Utah Energy Statistical Abstract," Table 2.21, Utah Energy Office, Printed December 2003
3. "Components of Population Change," Utah Population Estimates Committee, State of Utah Economic and Demographic Research Database
4. "State of Utah Population Estimates, Net Migration, Births and Deaths," Utah Population Estimates Committee, Governor's Office of Planning and Budget, DEA-UPEC Internet website

5. "Surveillance of Socio-Economic Characteristics, 1993 Supplement," Wasatch Front Regional Council
6. Letter from Roland Gow of Questar dated May 31, 1994

Combined 1993 Residential and Commercial Coal

Res. & Com. Coal Burned (tons/yr)	121000	Industrial Coal Burned (tons/yr)	15942000
Type	All State, UTAH		

Pollutant	Emission Factor (lbs/ton)
Residential/Commercial CO	275
Industrial CO	5

Population	1993
Utah	1889393
Salt Lake County	791724
Salt Lake City	160233

Location	Human Population	Population Distribution Ratio	Uncontrolled Emissions (tons/yr)	Controlled Emissions (tons/yr)	Uncontrolled Emissions (lbs/ton)	Controlled Emissions (lbs/ton)
Beaver	5172	0.00 R, 1:1	0.00	0.011	0.00	187.45
Box Elder	38314	0.02 R, 1:1	0.02	0.083	0.02	1388.59
Cache	77361	0.04 R, 1:1	0.04	0.169	0.04	2803.74
Carbon	19771	0.01 R, 1:1	0.01	0.043	0.01	716.55
Daggett	734	0.00 R, 1:1	0.00	0.002	0.00	26.60
Davis	205655	0.11 R, 1:50	0.00	0.009	0.00	149.07
Duchesne	13131	0.01 R, 1:1	0.01	0.029	0.01	475.90
Emery	10661	0.01 R, 1:1	0.01	0.023	0.01	386.38
Garfield	4227	0.00 R, 1:1	0.00	0.009	0.00	153.20
Grand	7582	0.00 R, 1:1	0.00	0.017	0.00	274.79
Iron	23965	0.01 R, 1:1	0.01	0.052	0.01	868.55
Juab	6204	0.00 R, 1:1	0.00	0.014	0.00	224.85
Kane	5421	0.00 R, 1:1	0.00	0.012	0.00	196.47
Millard	12189	0.01 R, 1:1	0.01	0.027	0.01	441.76
Morgan	6043	0.00 R, 1:1	0.00	0.013	0.00	219.01
Piute	1386	0.00 R, 1:1	0.00	0.003	0.00	50.23
Rich	1869	0.00 R, 1:1	0.00	0.004	0.00	67.74
Salt Lake	791724	0.42 R, 1:50	0.01	0.034	0.01	573.88
San Juan	13056	0.01 R, 1:1	0.01	0.028	0.01	473.18
Sanpete	18594	0.01 R, 1:1	0.01	0.041	0.01	673.89
Sevier	16292	0.01 R, 1:1	0.01	0.035	0.01	590.46
Summit	20221	0.01 R, 1:1	0.01	0.044	0.01	732.86

Location	Population	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio	Ratio
Tooele	28423	0.02	R, 1:1	0.02	0.062	7491.755	1030.12		
Uintah	24277	0.01	R, 1:1	0.01	0.053	6398.949	879.86		
Utah	292351	0.15	R, 1:50	0.00	0.013	1541.162	211.91		
Wasatch	11300	0.01	R, 1:1	0.01	0.025	2978.462	409.54		
Washington	61497	0.03	R, 1:1	0.03	0.134	16209.423	2228.80		
Wayne	2182	0.00	R, 1:1	0.00	0.005	575.133	79.08		
Weber	169791	0.09	R, 1:50	0.00	0.007	895.073	123.07		
Total	1889393	1.00		0.2429682	1	121000	16637.50		

Utah Population 1889393
Salt Lake City 1993 Population 160233
Salt Lake County 1993 Population 791724
Ratio Salt Lake City to Salt Lake County 0.20
Ratio Salt Lake City to Utah 0.08

Salt Lake City CO emissions

Total Salt City		
Residential/commercial	Emission Factor	CO tons/year
844.69	275.00	116.14

Residential Coal Emissions		
Coal burned/year	CO (tons/year)	CO tons/day
42.23	5.81	0.17
		0.02

Commercial		
Coal burned/year	CO (tons/year)	CO tons/day
802.45	110.34	3.31
		0.46

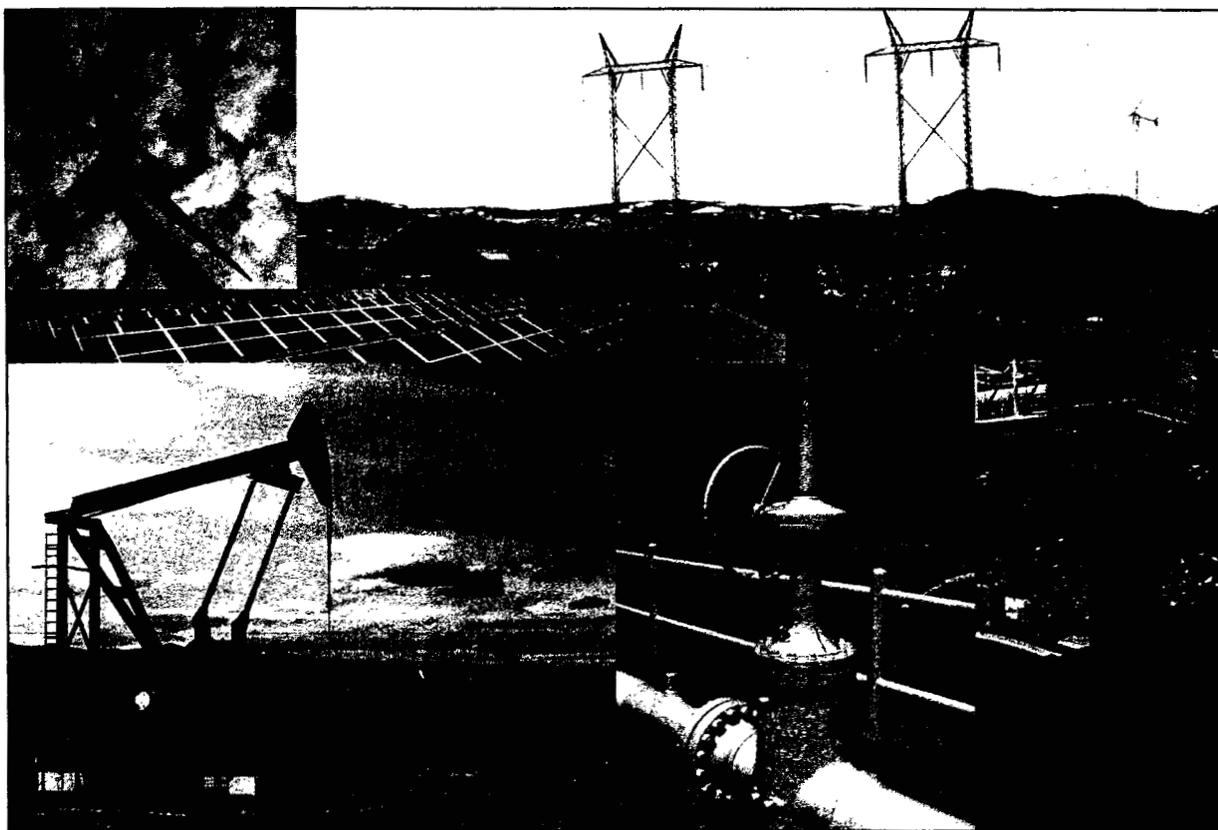
Industrial Coal									
Location	Human Population	Population Distrib. Ratio	Rural Or Urb? Coal Adj.	Urban Adjust. Ratio	Coal Distribution Ratio	Coal Burned tons/yr	Uncontrolled CO tons/yr		
Beaver	5172	0.00	R, 1:1	0.00	0.011	179610	24696.32		
Box Elder	38314	0.02	R, 1:1	0.02	0.083	1330542	182949.51		
Cache	77361	0.04	R, 1:1	0.04	0.169	2686539	369399.10		
Carbon	19771	0.01	R, 1:1	0.01	0.043	686594	94406.61		
Daggett	734	0.00	R, 1:1	0.00	0.002	25490	3504.85		
Davis	205655	0.11	R, 1:50	0.00	0.009	142837	19640.07		
Duchesne	13131	0.01	R, 1:1	0.01	0.029	456004	62700.58		
Emery	10661	0.01	R, 1:1	0.01	0.023	370228	50906.32		
Garfield	4227	0.00	R, 1:1	0.00	0.009	146792	20183.94		
Grand	7582	0.00	R, 1:1	0.00	0.017	263302	36204.08		
Iron	23965	0.01	R, 1:1	0.01	0.052	832240	114432.98		
Juab	6204	0.00	R, 1:1	0.00	0.014	215448	29624.13		
Kane	5421	0.00	R, 1:1	0.00	0.012	188257	25885.30		
Millard	12189	0.01	R, 1:1	0.01	0.027	423291	58202.53		
Morgan	6043	0.00	R, 1:1	0.00	0.013	209857	28855.35		
Piute	1386	0.00	R, 1:1	0.00	0.003	48132	6618.16		
Rich	1869	0.00	R, 1:1	0.00	0.004	64905	8924.48		
Salt Lake	791724	0.42	R, 1:50	0.01	0.034	549889	75609.71		
San Juan	13056	0.01	R, 1:1	0.01	0.028	453400	62342.46		
Sanpete	18594	0.01	R, 1:1	0.01	0.041	645719	88786.43		
Sevier	16292	0.01	R, 1:1	0.01	0.035	565777	77794.37		
Summit	20221	0.01	R, 1:1	0.01	0.044	702221	96555.36		
Tooele	28423	0.02	R, 1:1	0.02	0.062	987054	135719.95		
Uintah	24277	0.01	R, 1:1	0.01	0.053	843075	115922.78		
Utah	292351	0.15	R, 1:50	0.00	0.013	203051	27919.55		
Wasatch	11300	0.01	R, 1:1	0.01	0.025	392419	53957.55		
Washington	61497	0.03	R, 1:1	0.03	0.134	2135625	293648.44		
Wayne	2182	0.00	R, 1:1	0.00	0.005	75775	10419.06		
Weber	169791	0.09	R, 1:50	0.00	0.007	117928	16215.05		
Total	1889393	1.00		0.2429682	1	15942000	2192025.00		

Industrial	
Coal burned Salt Lake County	CO tons/year
549888.79	1374.72

CO Salt Lake City	278.22
CO Winter Season	105.72
CO Winter Day	1.15

UTAH ENERGY STATISTICAL ABSTRACT

With data through 2002



Prepared by the Utah Energy Office
Department of Natural Resources

www.energy.utah.gov

Printed December 2003



14,530 is the value used
in the table

Table 2.21 **Consumption of Coal in Utah by End Use, 1960-2002**
Thousand Short Tons

Year	Electric Utilities	Coke Plant	Other Industrial	Residential and Commercial	Total
1960	515	2,216	424	249	3,404
1961	563	1,930	363	244	3,100
1962	462	1,416	336	275	2,489
1963	447	1,362	331	228	2,368
1964	411	1,693	375	204	2,683
1965	363	1,917	389	181	2,850
1966	440	1,988	382	186	2,996
1967	410	1,845	313	181	2,749
1968	417	1,917	345	119	2,798
1969	375	1,964	483	161	2,983
1970	435	1,948	529	109	3,021
1971	417	1,859	527	240	3,043
1972	571	1,739	551	161	3,022
1973	984	1,889	812	199	3,884
1974	1,296	1,957	654	354	4,261
1975	2,026	1,985	493	131	4,635
1976	1,267	2,011	631	208	4,117
1977	2,511	1,995	640	282	5,428
1978	3,148	1,725	800	281	5,954
1979	4,151	1,566	844	542	7,103
1980	4,895	1,528	446	237	7,106
1981	4,956	1,567	714	196	7,433
1982	4,947	841	822	177	6,787
1983	5,223	829	629	191	6,872
1984	5,712	1,386	548	259	7,905
1985	6,325	1,254	472	252	8,303
1986	6,756	785	380	191	8,112
1987	11,175	231	276	124	11,806
1988	12,544	1,184	589	196	14,513
1989	12,949	1,179	686	231	15,045
1990	13,563	1,231	676	267	15,737
1991	12,829	1,192	508	305	14,834
1992	13,857	1,114	525	223	15,719
1993	13,995	1,220	727	121	16,063
1994	14,269	1,394	835	105	16,603
1995	13,325	1,358	915	77	15,675
1996	13,584	1,425	512	94	15,615
1997	14,252	1,240	709	123	16,324
1998	14,664	949	1,304	113	17,030
1999	14,590	1,162	745	114	16,611
2000	14,688	1,461	1,166	59	17,374
2001	14,906	1,391	1,235	60	17,592
2002	15,644	0	592	198	16,434

Source: EIA. *State Energy Report*, 1960-2000
EIA. *Annual Coal Report*, 2002 for 2001-2002 data

NATURAL GAS COMBUSTION

A. Calculation of Annual Emissions

Questar Corporation reported annual consumption from general service gas customers (GSDTH) and major gas customers (NONGSDTH) in Salt Lake City during calendar year 1993. The assumption was made that residential consumers comprise the entire GSDTH category, and that commercial and industrial users collectively comprise the entire NONGSDTH category.

In 1993 there were no point sources present within the maintenance area. Therefore, no point source consumption of natural gas was subtracted out of the natural gas consumption data from Questar Corporation. All natural gas was considered to be consumed in the area source inventory.

The first step is to convert the fuel consumption for MMBtu to MMCF. The regional natural gas company, Questar Corporation, stated that their gas generally contains 1,075 Btu per cubic foot.

$$(\text{MMBtu}) / (1,075 \text{ Btu/CF}) = \text{MMCF}$$

Emission factors from Table 1.4-1 of the AP42 were used to calculate natural gas combustion emissions for domestic and commercial boilers.

(emission factor, lbs/MMCF) * (fuel consumption) * (1 ton/2000 lbs) = emissions in ton/year.

Salt Lake City Residential Natural Gas Combustion

(GSDTH quantity, mmbtu/yr) * (mmscf/1,075 mmbtu) * (40 lbs CO/mmscf) = residential tonnage CO during the year.

$$(11,440,421 \text{ mmbtu/yr}) * (\text{mmscf}/1,075 \text{ mmbtu}) * 40 \text{ lbs CO/mmscf} * (1 \text{ ton}/2000 \text{ lbs}) = 212.845 \text{ tons CO/year}$$

Salt Lake Commercial and Industrial Natural Gas Combustion

(NONGSDTH mmbtu/yr) * (mmscf/1,075 mmbtu) * (84 lbs CO/mmscf) = commercial tonnage CO during the year.

$$((9,202,749 \text{ mmbtu/yr}) * (\text{mmscf}/1,075 \text{ mmbtu}) * (84 \text{ lbs CO/mmscf}) * (1 \text{ ton}/2000 \text{ lbs})) = 359.55 \text{ tons CO/year}$$

B. Calculation of Typical CO Winter-day Emissions;

Questar Corporation reported that, for a typical year, 38 percent of natural gas is consumed during the winter months of November, December, and January collectively. There were 92 days in the CO (winter) season.

Residential Natural Gas Combustion

(residential tonnage CO/year) * (38% during CO season) * (1 year/92 season days) = residential tonnage CO per winter day.

(212.845 tons CO/year) * (38% during CO season) * (1 year/92 days) = 0.8791 tons/day

Commercial and Industrial Natural Gas Combustion

(commercial tonnage CO/year) * (38% during CO season) * (1 year/92 season days) = commercial and Industrial tonnage CO per winter day.

(359.55 tons CO/year) * (38% during CO season) * (1 year/92 season days) = 1.49 tons/day

C. References

1. AP42. Section 1.4.
2. Various letters for Roland Gow, Questar Corporation
3. Point source inventory files, 1993

Natural Gas - 1993 Residential

Pollutant	Emission Factor (lb/MMCF)
CO	40

Total GSDTH Natural Gas Distributed

City	"MMBtu" units	"MMCF" units	CO (tons/yr)	CO (tons/winter day)
Salt Lake City	11440421	10642.25	212.85	0.88

Natural Gas - Commercial & Industrial

Pollutant	Emission Factor (lb/MMCF)
CO	84

Total NONGSDTH Natural Gas Distributed

City	"MMBtu" units	"MMCF" units	Point Source (MMCF)	Area MMCF	CO (tons/yr)	CO (tons/day)
Salt Lake City	9202749	8560.70	0	8560.70	359.55	1.485



QUESTAR
CORPORATION

Roland Gow
Manager
Environmental Affairs

RECEIVED
JUN 01 1994
Air Quality

Office: 180 East First South St.
Salt Lake City, Utah 84111
Phone: (801) 534-5594
Mail: P.O. Box 11150
Salt Lake City, Utah 84147
Fax: (801) 534-5131

May 31, 1994

Mr. Brock LeBaron, Manager
Technical Analysis Section
Division of Air Quality
150 North 1950 West
Salt Lake City, Utah 84114

Dear Mr. LeBaron:

Re: Fuel Consumption Data for 1993

Enclosed is the information you requested.

In calendar year 1993, 38% of the gas usage occurred in winter (November, December and January) and 13.2% occurred in summer (June, July, and August).

Should you require any further information, such as gas analyses or material to help you better calculate emissions, please do not hesitate to contact me.

Sincerely,

Roland Gow
Manager
Environmental Affairs

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1993 SALES AND AVERAGE CUSTOMERS

STATE=UT COUNTY=RICH
(continued)

RAC	CITY	GS DTH	NONGSDTH	TOTDTH	GS MTR	NONGSMTR	TOTMTR
COUNTY		51,900	0	51,900	316	0	316
STATE=UT COUNTY=SALT LAKE							
RAC	CITY	GS DTH	NONGSDTH	TOTDTH	GS MTR	NONGSMTR	TOTMTR
411	SALT LAKE CITY	11,440,421	9,202,749	20,643,170	59,107	172	59,279
412	SOUTH SALT LAKE	1,099,753	299,984	1,399,737	5,347	18	5,365
413	GRANGER	77,233	125,874	203,107	66	4	70
414	GRANITE SCHOOL	782,924	15,636	798,560	5,473	4	5,477
415	WEST VALLEY	2,615,040	96,291	2,711,331	19,692	9	19,701
416	MAGNA	621,689	5,711,504	6,333,193	5,374	7	5,381
431	33RD TO 39TH SO	1,437,811	158,861	1,596,672	9,535	6	9,542
432	EMIGRATION HL	15,455	0	15,455	59	0	59
433	EMIGRATION CYN	38,867	0	38,867	251	0	251
435	PARLEYS CYN	10,704	0	10,704	3	0	3
712	MURRAY	1,743,913	142,948	1,886,861	11,649	14	11,663
713	MURRAY OUT	1,142,176	112,616	1,254,792	7,990	8	7,998
716	UNION	946,817	23,363	970,200	8,049	5	8,053
721	SANDY	3,344,929	116,567	3,461,496	23,306	8	23,314
722	SANDY OUT	926,060	23,099	949,159	6,212	3	6,215
723	DRAPER	341,087	215,681	556,768	1,754	8	1,762
725	GRANITE	146,658	30,657	177,315	724	2	726
727	ALTA	31,521	6,354	37,875	58	1	59
728	SNOWBIRD	235	222,174	222,409	1	3	4
731	BLUFFDALE	83,289	0	83,289	597	0	597
732	MIDVALE	550,330	13,929	564,259	4,112	3	4,115
733	RIVERTON	442,598	23,519	466,117	3,541	1	3,542
734	SOUTH JORDAN	539,738	12,106	551,844	4,001	1	4,002
735	WEST JORDAN	1,614,722	923,905	2,538,627	12,308	11	12,319
736	WEST JORDAN OUT	439	0	439	4	0	4
741	KEARNS	992,996	27,788	1,020,784	7,723	3	7,726
742	KEARNS OUT	836,073	0	836,073	7,941	0	7,941
743	WEST VALLEY	875,173	25,954	901,127	7,798	4	7,801
744	WEST VALLEY HERCULES	3,084	999,703	1,002,787	3	2	6
745	COPPERTON	76,574	97,947	174,521	285	3	288
746	HERRIMAN	29,223	0	29,223	234	0	234
747	COPPERTON HL	9,926	0	9,926	2	0	2
748	TAYLORSVILLE	1,427,323	88,286	1,515,609	11,928	6	11,934
761	HOLLADAY	2,748,895	96,043	2,844,938	16,396	7	16,403
764	BUTLERVILLE	832,252	100,649	932,901	5,806	4	5,809
COUNTY		37,825,930	18,914,207	56,740,137	247,328	316	247,643

STATE=UT COUNTY=SANPETE

RAC	CITY	GS DTH	NONGSDTH	TOTDTH	GS MTR	NONGSMTR	TOTMTR
504	BIRDSEYE	1,526	0	1,526	10	0	10



Roland Gow
Coordinator
Environmental Programs



October 23, 1991

Mr. Steve Parkin
Utah Division of Air Quality
1950 West North Temple
Salt Lake City, UT 84116-0690

Dear Steve:

Re: Gas Usage for 1990

Attached are figures for calendar year 1990 for the use of natural gas in Utah counties and cities. Mountain Fuel Supply Company does not cover the whole of Utah, and you may wish to contact Utah Gas Services in Vernal for data on the eastern portion of the State. There are also several counties in the west which do not presently have natural gas service. These counties include Juab, Millard and Beaver, though they will have Mountain Fuel Supply gas service once the Kern River Pipeline is completed.

The tables indicate the amount of general service gas (GSDTH) and major customer gas (NONGSDTH) in decatherms or millions of Btu. Our gas generally contains about 1,075 Btu per cubic foot at 60 deg F and 14.73 psia. Total decatherms are supplied under TOTDTH, as are the numbers of general service meters and other meters. If you require more information or have any questions, please do not hesitate to ask.

Sincerely,

rg
Enclosures

X91-073PARKIN.L

bcc: C. E. Greenhawt
R. R. Durtschi



QUESTAR
CORPORATION

Roland Gow
Manager
Environmental Affairs

RECEIVED
JUN 01 1994
Air Quality

Office: 180 East First South St.
Salt Lake City, Utah 84111
Phone: (801) 534-5594
Mail: P.O. Box 11150
Salt Lake City, Utah 84147
Fax: (801) 534-5131

May 31, 1994

Mr. Brock LeBaron, Manager
Technical Analysis Section
Division of Air Quality
150 North 1950 West
Salt Lake City, Utah 84114

Dear Mr. LeBaron:

Re: Fuel Consumption Data for 1993

Enclosed is the information you requested.

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Should you require any further information, such as gas analyses or material to help you better calculate emissions, please do not hesitate to contact me.

Sincerely,

Roland Gow
Manager
Environmental Affairs



Roland Gow
Coordinator
Environmental Programs

October 23, 1991

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Utah Division of Air Quality
1950 West North Temple
Salt Lake City, UT 84116-0690

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Sincerely,

A handwritten signature in black ink, appearing to read "Roland Gow".

rg
Enclosures

X91-0731PARKIN.L

bcc: C. E. Greenhawt
R. R. Durtschi

OIL COMBUSTION

A. Calculation of annual Emissions

The Utah Energy Statistical Abstract documents the amount of fuel oil consumed by residential sources, commercial sources, and industrial sources in the state of Utah. It was assumed that the consumption of oil along the Wasatch Front as compared to consumption of fuel oil in the rest of the state was 1 to 10. First an Urban adjustment factor was calculated, using the 1 to 10 ratio described above. The Oil Distribution Ratio was obtained by dividing the Urban Adjustment Factor by the total of the state's Urban Adjustment Factors. The amount of fuel oil consumed in Salt Lake County was then determined by multiplying the oil distribution ratio by the total amount of oil consumed in Salt Lake County. The ratio of population in Salt Lake City to the population in Salt Lake County was used to determine the oil consumed in Salt Lake City. The population estimates were obtained from the Utah Office of Planning and Budget website. There were no point sources in the maintenance area in 1993. However, one source located in the maintenance area, Amoco Oil Co. (now called Tesoro West Coast) reported they consumed 4,100,000 gallons of fuel oil in 1993. This was considered to be commercial usage within Salt Lake City.

The conversion factor of 42 gallons of fuel oil / barrel was used to convert the data to kgals/year.

Residential oil usage

Emission factors for CO were obtained from AP42, Table 1.3-2.

$(\text{EF, lbs/kgals}) * (\text{OC, kgals/yr}) * (1 \text{ ton}/2000 \text{ lb}) = \text{emissions in tons per year}$

EF = Emission Factor
OC = Fuel Consumption

$(5 \text{ lbs/kgals}) * (392.6907 \text{ kgals}) * (1 \text{ ton}/2000 \text{ lbs}) = 0.9817 \text{ tons of CO}$

Commercial oil usage

The Utah Energy Statistical Abstract documents the amount of fuel oil consumed by commercial sources in the state of Utah. The same assumptions used in calculating the residential usage of fuel oil in Salt Lake City were used to calculate the commercial usage. There were no point sources in the maintenance area in 1993. However, one source located in the maintenance area, Amoco Oil Company (now called Tesoro West Coast) reported they consumed 4100 kgal of fuel oil in 1993. This was considered to be included in the commercial usage within Salt Lake City.

The distribution of commercial fuel oil throughout Utah shows 508.39 kgals used in Salt Lake City. Since this amount is greater than the amount reported by Amoco Oil Company, the decision was made to use 4100 kgals as the consumption amount to commercial fuel oil usage in Salt Lake City.

Emission factors for CO were obtained from AP42, Table 1.3-2.

$(\text{EF, lbs/kgals}) * (\text{OC, kgals/yr}) * (1 \text{ ton}/2000 \text{ lb}) = \text{emissions in tons per year}$

EF = Emission Factor

OC = Fuel Consumption

$(5 \text{ lbs/kgals}) * (4100 \text{ kgals}) * (1 \text{ ton}/2000 \text{ lbs}) = 10.25 \text{ tons of CO}$

Industrial fuel oil usage

After reviewing the largest stationary sources within Salt Lake City, it is assumed that none of the fuel oil consumed by industrial and electric utilities is used in the city.

B. Calculation of Typical CO Winter-day Emissions

It was assumed that the percent of fuel oil combustion in the CO winter season was identical to that of natural gas uses, which has been provided by Questar Corporation. There were 92 days in the winter season.

Residential

$(\text{CO tons/yr}) * (\% \text{NG use in winter}) / (92 \text{ days/winter season}) = \text{CO tons/day}$

$0.9817 * 38\% / 92 \text{ days} = 0.0041 \text{ CO tons/day}$

Commercial

$(\text{CO tons/yr}) * (\% \text{NG use in winter}) / (92 \text{ days/winter season}) = \text{CO tons/day}$

$10.25 * 38\% / 92 \text{ days} = .04 \text{ CO tons/day}$

C. References

1. Utah Energy Statistical Abstract, December 2003.
2. Utah Population Estimates Committee, Governor's Office of Planning and Budget.
3. 1993 Point Source Inventory, State of Utah Environmental Quality
4. AP42, section 1.3

Oil - 1993

RESIDENTIAL

Type	Oil Burned (kbbbl)	Oil Burned, kgal/yr (kgals)
All State	336	14112

Pollutant	Emission Factor (lbs/kgal)
CO	5

Location	Population
Salt Lake County	791724
Salt Lake City	160233

Location	Human Population	Population Distrib. Ratio	Rural/Urban? Oil Adj.	Urban Adjust. Factor	Oil Distribution Ratio	Oil Burned, kgal/yr	Oil Burned, kgal/yr, adjusted
Beaver	5172	0.00	R, 1:1	5172	0.009	126.753	0.32
Box Elder	38314	0.02	R, 1:1	38314	0.067	938.980	2.35
Cache	77361	0.04	R, 1:1	77361	0.134	1895.923	4.74
Carbon	19771	0.01	R, 1:1	19771	0.034	484.537	1.21
Daggett	734	0.00	R, 1:1	734	0.001	17.988	0.04
Davis	205655	0.11	R, 1:10	20565.5	0.036	504.009	1.26
Duchesne	13131	0.01	R, 1:1	13131	0.023	321.808	0.80
Emery	10661	0.01	R, 1:1	10661	0.019	261.274	0.65
Garfield	4227	0.00	R, 1:1	4227	0.007	103.593	0.26
Grand	7582	0.00	R, 1:1	7582	0.013	185.816	0.46
Iron	23965	0.01	R, 1:1	23965	0.042	587.322	1.47
Juab	6204	0.00	R, 1:1	6204	0.011	152.044	0.38
Kane	5421	0.00	R, 1:1	5421	0.009	132.855	0.33
Millard	12189	0.01	R, 1:1	12189	0.021	298.722	0.75

Localities	Human Population	Population Distribution Ratio	Total of Adjusted Ratio	Oil Distribution Ratio	Oil Distribution Ratio	
Morgan	6043	0.00 R, 1:1	6043	0.010	148.099	0.37
Piute	1386	0.00 R, 1:1	1386	0.002	33.967	0.08
Rich	1869	0.00 R, 1:1	1869	0.003	45.804	0.11
Salt Lake	791724	0.42 R, 1:10	79172.4	0.137	1940.316	4.85
San Juan	13056	0.01 R, 1:1	13056	0.023	319.970	0.80
Sanpete	18594	0.01 R, 1:1	18594	0.032	455.692	1.14
Sevier	16292	0.01 R, 1:1	16292	0.028	399.276	1.00
Summit	20221	0.01 R, 1:1	20221	0.035	495.566	1.24
Tooele	28423	0.02 R, 1:1	28423	0.049	696.576	1.74
Uintah	24277	0.01 R, 1:1	24277	0.042	594.968	1.49
Utah	292351	0.15 R, 1:10	29235.1	0.051	716.479	1.79
Wasatch	11300	0.01 R, 1:1	11300	0.020	276.935	0.69
Washington	61497	0.03 R, 1:1	61497	0.107	1507.137	3.77
Wayne	2182	0.00 R, 1:1	2182	0.004	53.475	0.13
Weber	169791	0.09 R, 1:10	16979.1	0.029	416.115	1.04
Total	1889393	1.00	575824.1	1	14112.000	35.28

Oil Burned	Kgals
Salt Lake County	1940.316
Salt Lake City	392.69

CO	tons/year
Salt Lake City	0.98

CO	tons/day
Salt Lake City	0.0041

COMMERCIAL

Type	Oil Burned (kbbbl)	Oil Burned, kgal/yr (kgals)
All State	435	18270

Pollutant	Emission Factor (lbs/kgal)
CO	5

Location	Population
Salt Lake County	791724
Salt Lake City	160233

Location	Human Population	Population Distrib. Ratio	Rural Oil Urb Oil Adj.	Urban Adjust. Factor	Oil Distribution Ratio	Oil Burned, kgal/yr	Oil Burned, kgal/yr
Beaver	5172	0.00	R, 1:1	5172	0.009	164.099	0.41
Box Elder	38314	0.02	R, 1:1	38314	0.067	1215.643	3.04
Cache	77361	0.04	R, 1:1	77361	0.134	2454.544	6.14
Carbon	19771	0.01	R, 1:1	19771	0.034	627.303	1.57
Daggett	734	0.00	R, 1:1	734	0.001	23.289	0.06
Davis	205655	0.11	R, 1:10	20565.5	0.036	652.511	1.63
Duchesne	13131	0.01	R, 1:1	13131	0.023	416.626	1.04
Emery	10661	0.01	R, 1:1	10661	0.019	338.257	0.85
Garfield	4227	0.00	R, 1:1	4227	0.007	134.116	0.34
Grand	7582	0.00	R, 1:1	7582	0.013	240.565	0.60
Iron	23965	0.01	R, 1:1	23965	0.042	760.372	1.90
Juab	6204	0.00	R, 1:1	6204	0.011	196.843	0.49
Kane	5421	0.00	R, 1:1	5421	0.009	172.000	0.43
Millard	12189	0.01	R, 1:1	12189	0.021	386.738	0.97
Morgan	6043	0.00	R, 1:1	6043	0.010	191.735	0.48

Location	Human Population	Population Distrib Ratio	Ratio of Oil Adj.	Ratio of Oil Adj. Ratio	Population of District	Ratio		
Piute	1386	0.00	R, 1:1		1386	0.002	43,976	0.11
Rich	1869	0.00	R, 1:1		1869	0.003	59,300	0.15
Salt Lake	791724	0.42	R, 1:10		79172.4	0.137	2512,017	6.28
San Juan	13056	0.01	R, 1:1		13056	0.023	414,247	1.04
Sanpete	18594	0.01	R, 1:1		18594	0.032	589,959	1.47
Sevier	16292	0.01	R, 1:1		16292	0.028	516,920	1.29
Summit	20221	0.01	R, 1:1		20221	0.035	641,581	1.60
Tooele	28423	0.02	R, 1:1		28423	0.049	901,817	2.25
Uintah	24277	0.01	R, 1:1		24277	0.042	770,271	1.93
Utah	292351	0.15	R, 1:10		29235.1	0.051	927,584	2.32
Wasatch	11300	0.01	R, 1:1		11300	0.020	358,531	0.90
Washington	61497	0.03	R, 1:1		61497	0.107	1951,204	4.88
Wayne	2182	0.00	R, 1:1		2182	0.004	69,231	0.17
Weber	169791	0.09	R, 1:10		16979.1	0.029	538,720	1.35
Total	1889393	1.00			575824.1	1	18270,000	45.68

Oil Burned	Kgals
Salt Lake County	2512,017
Salt Lake City	508,39

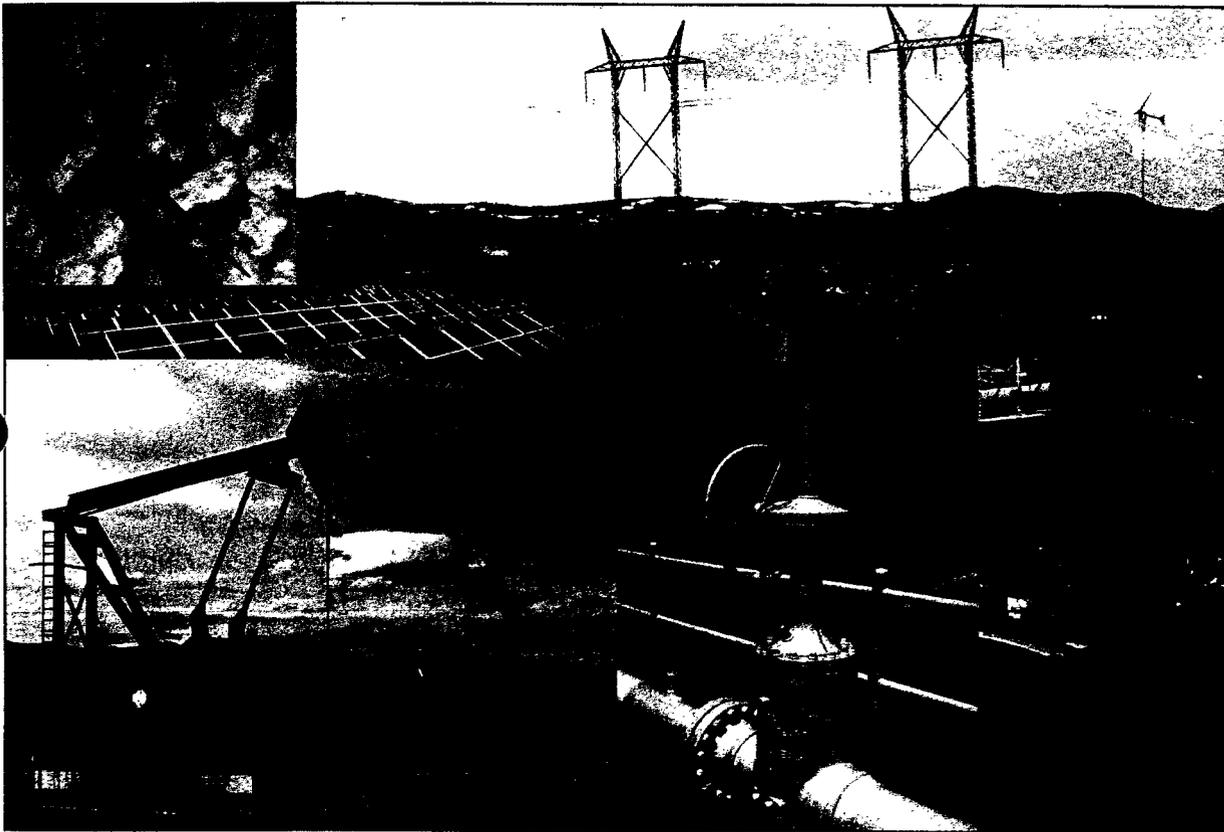
This amount is less amount reported by Amoco Oil Company (now called Tesoro West Coast). The decision was made to use 4100 kgals (reported by Tesoro) as the consumption amount for commercial fuel oil usage in Salt Lake City.

CO	Tons/yr
Salt Lake City	10.25

CO	Tons/yr
Salt Lake City	0.04

UTAH ENERGY STATISTICAL ABSTRACT

With data through 2002



Prepared by the Utah Energy Office
Department of Natural Resources

www.energy.utah.gov

Printed December 2003



*Historical data revised
in this table.*

Table 3.20 Consumption of Petroleum Products in Utah by End Use, 1960-2002
Thousand Barrels

Year	Residential	Commercial	Industrial	Transportation	Electric Utilities	Total
1960	349	1,349	6,642	11,698	2,302	22,341
1961	431	1,683	6,753	11,249	2,172	22,288
1962	400	1,904	7,780	12,189	1,677	23,950
1963	436	1,957	7,633	12,308	1,603	23,937
1964	517	1,942	7,708	12,364	1,531	24,063
1965	624	1,899	7,910	12,991	1,605	25,029
1966	570	1,981	8,597	14,482	1,430	27,060
1967	698	2,004	8,305	14,343	1,411	26,761
1968	832	2,085	8,792	15,413	1,437	28,559
1969	857	2,203	9,134	16,256	1,624	30,075
1970	844	1,687	8,249	16,893	1,777	29,450
1971	974	2,087	8,896	18,127	1,880	31,965
1972	1,082	2,028	9,850	19,018	1,269	33,247
1973	1,017	2,266	10,191	20,217	363	34,054
1974	985	2,441	11,312	20,692	141	35,571
1975	925	2,736	11,541	21,028	162	36,391
1976	933	2,748	11,712	21,488	80	36,961
1977	803	2,641	11,567	22,451	292	37,754
1978	817	2,424	11,309	23,969	182	38,701
1979	561	1,761	11,610	24,214	263	38,409
1980	460	2,255	9,897	23,245	126	35,983
1981	483	421	7,237	22,592	79	30,812
1982	600	641	6,839	22,424	59	30,563
1983	730	1,240	7,152	23,115	79	32,316
1984	813	998	6,690	23,570	58	32,129
1985	707	747	6,068	24,207	80	31,809
1986	698	1,091	6,410	26,072	135	34,406
1987	747	995	6,392	26,850	187	35,172
1988	760	887	6,570	27,651	103	35,971
1989	645	622	7,094	26,249	86	34,694
1990	567	613	6,649	27,169	84	35,082
1991	550	565	7,454	28,282	82	36,933
1992	432	542	6,772	28,717	62	36,524
1993	336	435	6,858	29,730	62	37,422
1994	263	478	7,187	30,290	57	38,275
1995	285	454	7,977	32,936	66	41,718
1996	329	456	9,525	34,260	59	44,628
1997	582	527	7,522	35,838	58	44,526
1998	222	579	7,934	36,643	66	45,446
1999	396	682	7,750	37,923	55	46,806
2000	672	513	7,877	40,015	101	49,179
2001	1,097	922	7,606	38,204	110	47,939
2002*	751	926	9,254	37,930	108	48,969

Source: EIA, *State Energy Data Report, 2001*

*UEO estimations

1993 INDUSTRIAL FUEL CONSUMPTION IN OUR DAVIS AND SALT LAKE COUNTIES

DAVIS COUNTY		COAL (ton/yr)	NATURAL GAS (mmscf/yr)	FUEL OIL (gal/yr)
SOURCE				
ALLIED SIGNAL		0	43.17	0
CHEVRON USA, INC.		0	6250.56	0
CRYSSEN REFINING		0	861.1	0
DAVIS COUNTY WASTE MANAGEMENT		0	0	96779
FLYING J, INC.		0	2623.34	0
HILL AIR FORCE BASE		0	1287.54	18982.99
PHILLIPS 66 COMPANY		0	2650.3	0
DAVIS COUNTY TOTAL		0	13716.01	115761.99
SALT LAKE COUNTY				
SOURCE				
AMOCO OIL CO.		0	3860.85	4100000
CENTRAL VALLEY WATER RECLAMATION		0	148.58	0
ENVIROTECH PUMPSYSTEMS		0	138.1	0
HERCULES		0	1262.59	0
KENNECOTT		304911	4989.34	140299.56
LDS HOSPITAL		0	176.13	0
NATIONAL SEMICONDUCTOR CORP.		0	120.28	0
PACIFICCORP GADSBY		0	4479	0
PUROLATOR PRODUCTS, INC.		0	22.55	0
STAKER PAVING AND CONSTRUCTION, INC.		5000	0	0
UNIVERSITY OF UTAH		0	900.49	0
UTILITY TRAILER MAN. CO.		0	3.07	0
ZERO ENCLOSURES		0	42.92	0
SALT LAKE COUNTY TOTAL		309911	16143.9	4240299.56

OPEN BURNING

NEGATIVE DECLARATION

According to the state of Utah, Utah Air Conservation Rules, open burning is not allowed without a permit. Permits are only issued during a 30-day period between March 30 and May 30 in Salt Lake County. Therefore, emissions during the CO winter season (November 1 through January 31) are prohibited by law, and there is a negative declaration for the CO winter season day.

References

1. Utah Air Conservation Rules, R307-202-5, Permissible Burning – With Permit – Exemptions.

Utah

AIR QUALITY RULES

This copy is produced by the Division of Air Quality. The official copy of the Utah
Administrative Code will be available at
[HTTP://WWW.RULES.UTAH.GOV](http://www.rules.utah.gov)
after September 1, 2003

EFFECTIVE August 5, 2003

(3) controlled heating of orchards or other crops to lessen the chances of their being frozen so long as the emissions from this heating do not violate minimum standards set by the board; and

(4) the controlled burning of not more than two structures per year by an organized and operating fire department for the purpose of training fire service personnel when the United States Weather Service clearing index is above 500.

See also Section 11-7-1(2)(a).

R307-202-2. Community Waste Disposal.

No open burning shall be done at sites used for disposal of community trash, garbage and other wastes except as authorized through a variance or as authorized for a specific period of time by the Board on the basis of justifiable circumstances reviewed and weighed in terms of pollution effects and other relevant considerations at an appropriate hearing following written application.

R307-202-3. General Prohibitions.

No person shall burn any trash, garbage or other wastes, or shall conduct any salvage operation by open burning except in conformity with the provisions of R307-202-4 and 5.

R307-202-4. Permissible Burning - Without Permit.

When not prohibited by other laws or by other officials having jurisdiction and provided that a nuisance as defined in Section 76-10-803 is not created, the following types of open burning are permissible without the necessity of securing a permit:

- (1) in devices for the primary purpose of preparing food such as outdoor grills and fireplaces;
- (2) campfires and fires used solely for recreational purposes where such fires are under control of a responsible person;
- (3) in indoor fireplaces and residential solid fuel burning devices except as provided in R307-302-2;
- (4) properly operated industrial flares for combustion of flammable gases; and
- (5) burning, on the premises, of combustible household wastes generated by occupants of dwellings of four family units or less in those areas only where no public or duly licensed disposal service is available.

R307-202-5. Permissible Burning - With Permit.

- (1) Open burning is authorized by the issuance of a permit as specified in (3) below when not prohibited by other laws or other officials having jurisdiction, and when a nuisance as defined in Section 76-10-803 is not created.
- (2) Individual permits for the types of burning listed in (3) below may be issued by an authorized local authority under the "clearing index" system approved and coordinated by the Department of Environmental Quality.

(3) Types of burning for which a permit may be granted are:

- (a) open burning of tree cuttings and slash in forest areas where the cuttings accrue from pulping, lumbering, and similar operations, but excluding waste from sawmill operations such as sawdust and scrap lumber;
- (b) open burning of trees and brush within railroad rights-of-way provided that dirt is removed from stumps before burning, and that tires, oil more dense than #2 fuel oil or other materials which can cause severe air pollution are not used to start fires or keep fires burning;
- (c) open burning of solid or liquid fuels or structures for removal of hazards or eyesores;
- (d) open burning, in remote areas, of highly explosive or other hazardous materials, for which there is no other known practical method of disposal;
- (e) open burning of clippings, bushes, plants and prunings from trees incident to property clean-up activities provided that the following conditions have been met:

(i) in any area of the state, the local county fire marshal has established a 30 day period between March 1 and May 30 for such burning to occur and notified the executive secretary of the open burning period prior to the commencement of the 30 day period, or, in areas which are located outside of Salt Lake, Davis, Weber, and Utah Counties, the local county fire marshal has established, if allowed by the state forester under Section 65A-8-9, a 30 day period between September 15 and October 30 for such burning to occur and has notified the executive secretary of the opening burning period prior to the commencement of the 30 day period;

- (ii) such burning occurs during the period established by the local county fire marshal;
- (iii) materials to be burned are thoroughly dry;
- (iv) no trash, rubbish, tires, or oil are used to start fires or included in the material to be burned.

(4) The Board may grant a permit for types of open burning not specified in (3) above on written application if the Board finds that the burning is not inconsistent with the State Implementation Plan.

R307-202-6. Special Conditions.

Open burning for special purposes, or under unusual or emergency circumstances, may be approved by the executive secretary.

**KEY: air pollution, open burning*, fire marshal*
1999**

**19-2-104
11-7-1(2)(a)
65A-8-9**

R307. Environmental Quality, Air Quality.

R307-203. Emission Standards: Sulfur Content of Fuels.

R307-203-1. Commercial and Industrial Sources.

ORCHARD HEATERS

NEGATIVE DECLARATION

Dale Jost, a member of the local Fruit Growers Association, was contacted for information about orchard heater use. According to Dale, orchard heaters are no longer used. Therefore, annual and seasonal emissions from orchard heaters are declared as negative. This category will no longer be addressed.

STRUCTURE FIRES

A. Calculation of Annual Emissions

A default fire occurrence number of 2.3 fires per 1000 people for structural fires and a default fuel loading factor of 1.15 tons of material per fire were obtained from "Emission Inventory Improvement Program (EIIP)," Vol. III, (1/31/01 ed.), Chapter 18, "Structure Fires." Emission factors for CO were obtained from the same EPA guidance document. These factors were multiplied by the population of Salt Lake City to obtain the annual emissions of CO. Population numbers were obtained from the Wasatch Front Regional Council.

$(\text{population}) * (2.3 \text{ fires}/1000 \text{ people}) * (1.15 \text{ tons material}) * (\text{EF lbs}/\text{ton material}) / (2000 \text{ lbs}/\text{ton} = \text{emissions tons}/\text{yr})$

$(160233) * (2.3 \text{ fires}/1000 \text{ people}) * (1.15 \text{ tons material}) * (60 \text{ lbs}/\text{ton material}) / 2000 \text{ lbs}/\text{ton} = 12.7145 \text{ tons CO}/\text{year}$

B. Calculation of Typical Winter-day Emissions

The "CO season" in Salt Lake City begins in January of any given calendar year. The CO season is then interrupted by the summer months and continues to include November and December of that calendar year. Using data from the EIIP, it is found that the percentage of fires that occur in January, November, and December is 27.05 percent of annual fires.

$(\text{emission tons}/\text{yr}) * (27.05\%) / (92 \text{ days in CO season}) = \text{emissions tons}/\text{winter day}$

$(12.7145 \text{ tons}/\text{year}) * (27.05\%) / (92 \text{ days in CO season}) = 0.0374 \text{ tons}/\text{winter day}$

C. References

1. "Emission Inventory Improvement Program (EIIP)," Vol. III, (1/31/01 ed.), Chapter 18, "Structure Fires"
2. "Surveillance of Socio-Economic Characteristics," 1993 Supplement, Wasatch Front Regional Council

STRUCTURE FIRES

Consumption Factors	
2.3	fires/1000 people
1.15	tons material burned/fire

Pollutant	Emission factor (lbs/ton of material burned)
CO	60

City	Population	Estimated number of Fires	CO (tons/year)
Salt Lake City	160233	368.54	12.71

Percentage of emissions during CO emission season (November, December, January)
27.05%

Number of days during CO season
92

Winter-day emissions

12.71 tons/year *27.05% / 92 days =	0.04 tons/winter day
-------------------------------------	----------------------

VEHICLE FIRES

A. Calculation of Annual Emissions

A default fire occurrence number of 1.25 fires per 1000 people for vehicle fires was obtained by sampling the "Utah Fire Incident Reporting System" of the Utah Fire Marshall's Office. A default material burned factor of 0.25 per fire was obtained from "Emission Inventory Improvement Program (EIIP), "Volume III, "Area Sources Category method Abstract – Vehicle Fires," (5/15/99 ed.).

$(\text{population}) * (1.25 \text{ fires}) / (1000 \text{ people}) * (0.25 \text{ tons material}) * (125 \text{ lbs/ton}) / (2000 \text{ lbs/ton}) = \text{emissions tons/yr}$

$(160233) * (1.25 \text{ fires}) / (1000 \text{ people}) * (0.25 \text{ tons materials}) * (125 \text{ lbs/ton}) / (2000 \text{ lbs/ton}) = 3.13 \text{ tons/yr}$

B. Calculation of typical CO Winter-day Emissions

An equal distribution of vehicle fires throughout the year with a seven-day activity week is assumed to occur.

$(\text{emissions tons/yr}) / 365 \text{ days/year} = \text{emissions tons/day}$

$(3.13 \text{ tons/yr}) / 365 \text{ days/year} = 0.01 \text{ tons/day}$

C. References

1. "Emission Inventory Improvement Program (EIIP), "Volume III, "Area Sources Category method Abstract – Vehicle Fires," (5/15/99 ed.)
2. "Utah Fire Incident Reporting System, Utah Fire Marshall's Office
3. "Surveillance of Socio-Economic Characteristics," 1993 Supplement, Wasatch Front Regional Council

VEHICLE FIRES

Consumption Factors	
1.25	fires per 1000 people
0.25	tons material burned per fire

Pollutant	Emission Factor (lbs/ton of material burned)
CO	125

City	Population	Estimated number of Fires	CO (tons/year)	CO (tons/winter day)
Salt Lake City	160233	200.29	3.13	0.01

WOOD COMBUSTION

A. Calculation of Annual Emissions

Emission Factors

Emission factors for CO emissions for fireplaces were obtained from the "Emissions Inventory Improvement Program." Units are pounds of pollutant per ton of wood burned.

The emission factors (EFs) for wood stoves were divided among several stove types. EIIP Table 2.4-2 gives EF for five types of wood stoves. Of these five, Utah Division of Air Quality staff estimated that three types adequately cover wood stove use in Utah. These three types are conventional, non-catalytic, and catalytic stoves.

Relative Impact of Each Woodburning System

The PARIA survey was utilized to apportion wood stoves among the three stove types. PARIA surveyed 1005 households in Davis, Salt Lake, and Utah counties in February 1993 about their home heating equipment and tendencies. Survey statistics for Utah County were retained to (a) provide a larger survey pool and (b) Utah County responses were significantly similar to Salt Lake and Davis County responses to not significantly taint the response conclusions.

From the PARIA questionnaire, responses to the question "How old is your woodburning/coal stove?" were used as a surrogate question to estimate ownership of conventional, catalytic, and non-catalytic stoves. PARIA summarized the result of stove age in the appendix of this section. Catalytic and non-catalytic stoves claim an increasing market share for more current age groupings. The responses are summarized below. These estimates resulted in a split of each heating system type are as follows:

Stove Age	Conventional	Non-Catalytic	Catalytic	All Types
Less than 1 year old	1	1	1	3
1 to 3 years	5	5	2	12
4 to 6 years	18	8	2	28
7 to 10 years	20	7	2	29
Older than 10 years	28	0	0	28
Total	72	21	7	100

The "Canon City Element of Colorado SIP for PM₁₀ Matter," July 1988 was used to estimate a split of 20 percent/80 percent for fireplaces and wood stoves. The percentages are based on wood consumed, not heating system ownership. Intuitively, fireplaces comprise more than 20 percent of the number of systems; however, stove owners tend to burn larger quantities of wood. The stove percentages above were multiplied by 0.80 to determine the total percentage of wood consumed by fireplaces

and each stove type. The emission factors for each type of burning system were then weighted by the percentage of wood burned, to arrive at an emission factor for the hybrid burning system (all types).

Type	% Wood Consumed	CO emissions (lb/ton)
Fireplaces	0.2	252.6
Conventional Stoves	0.57	230.8
Non-Catalytic Stoves	0.17	140.8
Catalytic Stoves	0.06	107.0
Weighted Factors-Hybrid System	1	212.43

The wood consumption per capita factor of 0.1375 tons/person/year is documented in Utah 1998 PM₁₀ SIP. Fuelwood harvest from the six major Utah forest was 19,777 million board feet (MMBF) in 1991, assumed equivalent to 0.1375 tons per capita. Fuelwood harvested in years after 1991 has declined steadily. That decline reduces the 0.1375 factor proportionately. All counties in Utah are uniformly indexed to the fuelwood ratio and county populations of people.

(total million board feet in 1993/million board feet in 1991) * 0.1375 = tons of wood per capita factor for 1993

(16.362 MMBF) / (19.777 MMBF) * (0.1375) = 0.1138 tons of wood/capita factor for 1993

Population estimates were obtained from the Wasatch Front Regional Council's "Surveillance of Socio-Economic Characteristics".

(population) * (wood consumption/capita/yr) * (EF) / 2000 lbs/ton = pollutant tons/yr

(160233) * (0.1138 tons/capita/yr) * (212.43 lbs/ton) / 2000 lbs/ton = 1936.05 tons/yr of CO

B. Calculation of Typical CO winter-day emissions

Beginning November 1992, Utah Administrative Code, R307-302-2 restricts the use of residential woodburning devices during the winter season when the local meteorology indicates high, or potentially high, concentrations of airborne particulate. A "green light" means that no restrictions are in effect, a "yellow light" means that voluntary restrictions are in effect, and a "red light" means that mandatory restrictions are in effect. The public is informed of the burn/no-burn conditions during daily weather reports conducted by all three network news stations. Frequently, no-burn conditions are repeated on television and radio programs throughout the day. Local newspaper agencies commonly print the burn/no-burn condition in the top corner of the front page of the daily newspapers. Warnings are given often accompanied by a citation.

Because high CO concentrations do not occur under the same conditions as high PM₁₀ concentrations, it was assumed that these restrictions would not have any effect on a typical "CO winter day." Therefore, no emission reduction is calculated for daily CO emissions in Salt Lake City.

When calculating typical CO winter-day emissions, several factors must be considered. Because emissions from woodburning stoves occur primarily during the winter, these emissions must be weighted towards the winter months. A seasonal adjustment factor of 2.12, obtained from the Utah PM₁₀ SIP, is multiplied by the daily emissions to weight the emissions towards the winter months.

uncontrolled emissions (tons/day) = uncontrolled emissions (tons/yr) / 365 days/yr *
2.12

$$(1936.05 \text{ tons/yr}) / (365 \text{ days/yr}) * 2.12 = 11.25 \text{ tons/day}$$

C. References

1. "Emission Inventory Improvement Program," Vol. III Chapter 2, "Residential Wood Combustion," January 2001 edition
2. "Canon City Element of Colorado SIP for PM₁₀ Matter", July 1988.
3. Utah Division of Air Quality, 1989 PM₁₀ SIP.
4. PARIA Group, Telephone Survey, February 1993
5. Utah's Governor's Office of Planning and Budget, Utah Population Estimates Committee, May 4, 2004.
6. Utah Air Conservation Rules, R307-302-2, Davis, Salt Lake, Utah Counties: Residential Fireplaces and Stoves
7. "Volume of Fuelwood Sold in Utah 1991 through 2002," from the United States Forest Service.

WOOD COMBUSTION

Burner Type	Percentage of Wood Consumed	CO Emissions (lbs/ton)
Fireplaces	20%	252.60
Conventional Stoves	57%	230.80
Non-catalytic Stoves	17%	140.80
Catalytic Stoves	6%	107.00

Weighted Emission Factors (lbs pollutant/ton wood)	CO
	212.43

1993 Fuelwood sold in Utah	16.362	MMBF
1991 Fuelwood sold in Utah	19.777	MMBF

Consumption Factor = (16.362/19.777)*1375	0.11375714	tons of wood burned/person in this inventory year (tons of wood)
--	------------	--

City	Population	Wood burned (ton of wood)	CO (tons/year)
Salt Lake City	160233	18227.65	1936.05

Typical CO Winter-day emissions	
CO tons/year	CO tons/day
1936.05	11.25

Attachment 1

This page was extracted from PARIA GROUP, survey question #10, February 9, 1993.

Utah Bureau of Air Quality - Air Pollution & Heating Methods AIR9301Z

TABLE 10: How old is your woodburning / coal stove?

	TOTAL	Utah	S.L.	Davis
TOTAL RESPONSES	282	120 43%	66 23%	96 34%
Less than 1 Year	8 3%	4 3%	1 2%	3 3%
1-3 years	34 12%	18 15%	6 9%	10 10%
4-6 years	80 28%	22 18%	28 42%	30 31%
7-10 years	82 29%	41 34%	12 18%	29 30%
older than 10 years	78 28%	35 29%	19 29%	24 25%
MEAN	3.67	3.71	3.64	3.64
S.D.	1.09	1.14	1.05	1.07

Paria Group (801) 226-8200

TABLE 1: Subdivision of Stove Type from PARIA Survey, "How old is your woodburning / coal stove?"				
	Conv.	Non.Cat.	Cat	All Types
Less than 1 year	1	1	1	3
1 to 3 years	5	5	2	12
4 to 6 years	18	8	2	28
7 to 10 years	20	7	2	29
Older than 10 years	28	0	0	28
SUM	72	21	7	100

TABLE 2: Stoves Must Fit 80% Globally.				
	Conv.	Non.Cat.	Cat	All Types
SUM (Locally)	72	21	7	100
SUM (Globally)	58	17	6	80

TABLE 3: AP42, 1.9 and 1.10 Emission Factors				
	% Wood By Type	CO (lbs/ton)	NOX (lbs/ton)	NMHC (lbs/ton)
Fireplaces	20	252.6	2.6	26
Stoves, Conventional	57	230.8	2.8	28
Stoves, Non-Cat.	17	140.8	2.2	21
Stoves, Cat.	6	104.8	2	17.2
SUM	100			

TABLE 4: Weighted Emission Factors			
	CO (lbs/ton)	NOX (lbs/ton)	NMHC (lbs/ton)
Hybrid Burning System	212.30	2.61	25.76

Attachment 2

January 7, 1984 - 5.6 ug/m³
December 27, 1985 - 14.2 ug/m³
December 16, 1986 - 15.2 ug/m³
January 27, 1987 - 11.7 ug/m³

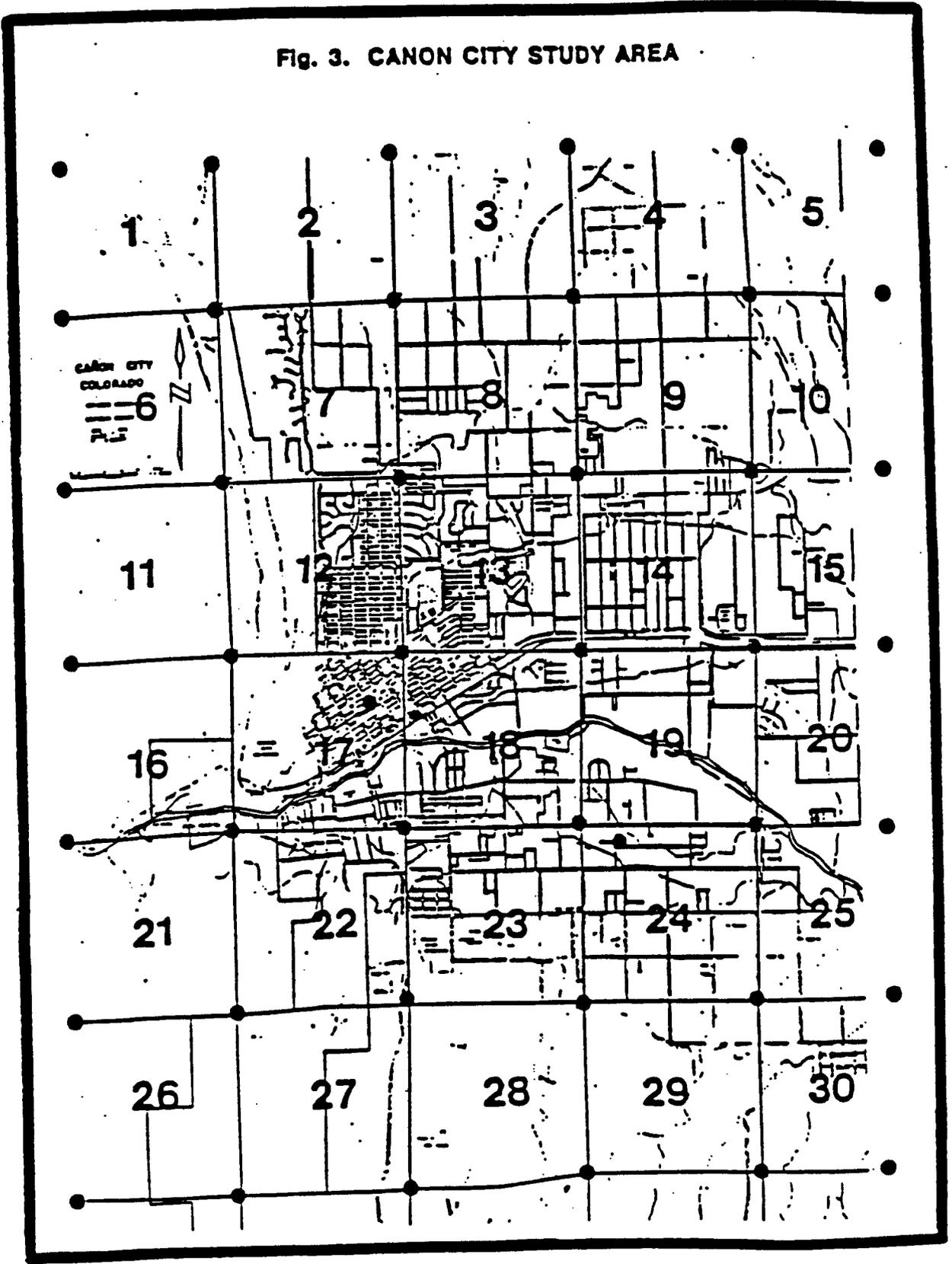
Emissions Inventory

A review of the last four years TSP data indicates that high particulate concentrations occur exclusively in the wintertime. Therefore, an inventory of all emission sources was prepared which was composed of six categories. These categories included: fireplaces, woodstoves, coalstoves, vehicle tailpipe from vehicular entrainment of sand applied for snow traction) and vehicular entrainment of dirt tracked by vehicles onto paved roads.

A city map was then divided into grid cells to prepare the emission inventory. This is shown in Figure 3. The emissions in each grid cell would be input into the model. Also, the map was used to locate receptors. Receptors are points where the model predicts PM₁₀ levels. Receptors were placed at the intersection of the 30 emission grids and at the location of the existing monitor at the County Courthouse. Another receptor was placed at the McKinley School where a monitor was in operation in 1983.

Much of the information on fireplaces, woodstoves, and coalstoves was obtained from a woodburning survey conducted by the Air Pollution Control Division and Canon City mailed to 2000 homes in the Canon City area in late 1987. Approximately 34 percent of these were returned. The assumed number and location of fireplaces, woodstoves, and coalstoves in Canon city were based on the results of this survey are given in Table 2 thru 4. The City of Canon City Planning Department estimated that the Canon City area will experience a two percent growth rate in population between now and 2000. This two percent growth rate was applied to the fireplace, woodstove, and coalstove numbers to project them to 1991 and 2000. The percent of fireplaces, woodstoves, and coalstoves in use at any given hour is shown in Table 5. These percentages were derived from questions in the survey concerning number of fires during the week; fireplaces (2.5%) woodstoves (4.95%) and coalstoves (6.26%); average length of a fire; fireplace (4.87 hours), woodstove (11.02 hours) and coalstove (21.16 hours); and what time of day a fire is typically started. The survey questions on number of fires per week, average length of a fire and number of cords of wood burned per season were used to help calculate burn rates. The burn rates, emission factors, and emission rates applied in Canon City for fireplaces, woodstoves, and coalstoves are given in Table 6. Fireplaces added after 1991 are given lower emission because it is assumed Colorado will have a fireplace regulation by then. Woodstoves added after 1986 will be affected by Colorado's Woodstove Certification Program. It is assumed by 2000 all existing woodstoves will have been replaced by the Phase 2, clean-burning woodstoves. Those woodstoves added between 1987 and 1991 will be a mix of Phase 1 and 2.

Fig. 3. CANON CITY STUDY AREA



Point sources of PM₁₀ emission in the Canon City area were obtained from the Division's EIS system. This list of sources was reviewed by Division staff and Canon City officials for accuracy. The PM₁₀ point sources, stack parameters, and emission rates are given in Table 7. Actual emissions are used in the model validation and allowable emissions for the 1991 and 2000 projections.

Vehicles produce the following types of emissions: tailpipe, reentrainment of sand, and reentrainment of street dirt. Estimates on the amount of vehicle miles traveled (VMT) in each grid were derived by using city and Department of Highways traffic counts on all types of roads and then calculating the length of each type of road in each grid. The 1991 and 2000 VMT figures were computed by assuming a two percent growth rate in VMT each year. PM₁₀ tailpipe emissions were calculated for these VMT using the EPA model MOPART.

Road sanding emissions were only given to those streets where sand was applied. This information was provided by Canon City. The actual sanding emission rate was calculated using an equation derived from the Denver Demonstration Study for silt loading. It was discovered during the running of the model that this calculated rate would have to be modified. More detailed information was provided by Canon City staff on specific streets that were sanded and on any periods of abnormally high sand application. Additionally, meteorological information on snowfall around the design day was also used. Thus, instead of using a seasonal average sanding emission rate a specific sanding rate was developed for the January 7, 1984 design day. The sanding emission rate used in the final modeling analysis was 25.6 g/Km of roadway.

Table 2

Number of Fireplaces and Their Location in Canon City.

<u>Grid #</u>	<u>1987</u>	<u>1991</u>	<u>2000</u>
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	53	57	67
7	18	19	23
8	0	0	0
9	0	0	0
10	0	0	0
11	176	190	222
13	123	133	155
12	265	286	334
14	44	48	55
15	18	19	23
16	35	38	44
17	79	85	100
18	88	95	111
19	0	0	0
20	0	0	0
21	9	10	11
22	62	67	78
23	35	38	44
24	26	28	33
25	0	0	0
26	0	0	0
27	0	0	0
28	0	0	0
29	0	0	0
Total	1031	1113	1300

Table 3

Number of Woodstoves and Fireplace Inserts
and Their Location in Canon City.

<u>Grid #</u>	<u>1987</u>	<u>1991</u>	<u>2000</u>
1	0	0	0
2	0	0	0
3	0	0	0
4	9	10	11
5	0	0	0
6	35	38	44
7	53	57	67
8	26	28	33
9	0	0	0
10	0	0	0
11	229	247	289
12	309	334	390
13	229	247	289
14	62	67	78
15	0	0	0
16	115	124	145
17	194	210	244
18	132	143	166
19	79	85	100
20	0	0	0
21	53	57	67
22	132	143	166
23	194	210	244
24	44	48	55
25	0	0	0
26	0	0	0
27	0	0	0
28	26	28	33
<u>29</u>	<u>9</u>	<u>10</u>	<u>11</u>
Total	1930	2086	2432

Table 4

Number of Coal Stoves and Their Location in Canon City.

<u>Grid #</u>	<u>1987</u>	<u>1991</u>	<u>2000</u>
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	9	10	11
7	18	19	23
8	0	0	0
9	0	0	0
10	0	0	0
11	18	19	23
12	35	38	44
13	18	19	23
14	9	10	11
15	0	0	0
16	18	19	23
17	44	48	55
18	35	38	44
19	0	0	0
20	0	0	0
21	9	10	11
22	18	19	23
23	62	67	78
24	9	10	11
25	0	0	0
26	0	0	0
27	0	0	0
28	18	19	23
29	0	0	0
<u>Total</u>	<u>320</u>	<u>345</u>	<u>403</u>

Table 5

Percentage of Canon City Fireplaces, Woodstoves
and Coalstoves in Use.

<u>Hour</u>	<u>Fireplaces</u>	<u>Woodstoves</u>	<u>Coalstoves</u>
0000 - 0100	5	50	100
0100 - 0200	0	50	100
0200 - 0300	0	48	75
0300 - 0400	0	40	56
0400 - 0500	0	24	44
0500 - 0600	0	11	59
0600 - 0700	4	20	78
0700 - 0800	9	37	88
0800 - 0900	11	44	100
0900 - 1000	13	44	100
1000 - 1100	13	44	100
1100 - 1200	9	44	100
1200 - 1300	4	44	100
1300 - 1400	4	44	100
1400 - 1500	6	44	92
1500 - 1600	8	46	86
1600 - 1700	16	51	86
1700 - 1800	34	52	90
1800 - 1900	62	49	94
1900 - 2000	75	48	90
2000 - 2100	78	50	90
2100 - 2200	70	50	94
2200 - 2300	52	50	94
2300 - 2400	22	50	100

Table 6

Fireplace, Woodstove, and Coalstoves Emission Factors,¹
Burn Rates, and Emission Rates for Canon City.

	<u>Emission Factor</u> (g/Kg)	<u>Burn Rate</u> (Kg/hr)	<u>Emission Rate</u> (g/hr)
<u>1986</u>			
Fireplaces	18.8	3.5	65.8
Woodstoves	39.0	1.5	43.5
Coalstoves	15.0	0.37	5.6
<u>1991</u>			
Fireplaces	18.8	3.5	65.8
Pre-1987 Woodstoves	29.0	1.5	43.5
1987-1991 Woodstoves	11.8	1.27	15.0
Coalstoves	15.0	0.37	5.6
<u>2000</u>			
Pre-1992 Fireplaces	18.8	3.5	65.8
1992-2000 Fireplaces	9.4	3.5	32.9
Woodstoves	7.2	1.2	8.6
Coalstoves	15.0	0.37	5.6

¹ Woodburning emission factors from Shelton 1985.

Attachment 3

Division of Environmental Health
Bureau of Air Quality
PM10 S.I.P

Winter of 88/89 Emissions Inventory - Salt Lake & Davis Counties

(1) Area source emissions	(Tons/Month)				Annual-> Winter Month Conversion Factor	1988 ACTUAL (Tons/Year)		
	PM-10	SO2	NOX	TOTAL		PM-10	SO2	NOX
A> Vehicular								
Unleaded	9.3	23.5	262.5	295.3				
Leaded	15.1	38.1	425.5	478.7				
Diesel	51.8	157.6	693.6	903.0				
Road dust	826.2	0.0	0.0	826.2				
Road sanding	26.1	0.0	0.0	26.1				
Road salt	135.6	0.0	0.0	135.6				
Brake wear	36.7	0.0	0.0	36.7				

Sub-Total	1100.9	219.2	1381.6	2701.7				
B> Other transportation								
Trains	7.4	14.3	93.1	114.8	0.0833	88.4	172.1	1117.1
Airplanes	6.8	9.5	79.8	96.0	0.0833	81.4	113.7	957.5

Sub-Total	14.2	23.8	172.9	210.8		169.8	285.8	2074.6
C> Space Heating								
Wood Burning	334.6	4.5	31.2	370.3	0.177	1890.5	25.2	176.4
Coal burning	12.3	46.2	6.0	64.5	0.177	69.5	261.1	33.6
Natural Gas	17.3	2.2	363.7	383.2	0.177	97.6	12.3	2054.9
Res/Comm Oil&Others	4.6	120.0	45.7	170.3	0.177	25.7	677.9	258.3

Sub-Total	368.7	172.8	446.6	988.2		2083.3	976.5	2523.2

(2) Major Source Inventory - Salt Lake and south Davis county

COMPANY NAME	January 1989 monthly inventory (Tons/Month)			
	PM-10	SO2	NOX	TOTAL
AMOCO	8.9	668.9	33.7	711.5
ASPHALT MATERIALS asphalt plant	0.0	0.0	0.0	0.0
ASPHALT MATERIALS crusher	0.0	0.0	0.0	0.0
BOUNTIFUL CITY POWER	0.0	0.1	1.9	2.0
CENTRAL VALLEY WATER	0.0	0.4	17.6	18.1
CHEVRON	15.2	200.0	98.2	313.4
CONCRETE PRODUCTS #2 HOBUSCH 9400 S	0.1	0.0	0.2	0.3
CONCRETE PRODUCTS #3 2200 NO. BOUNT	0.1	0.0	0.2	0.3
CONCRETE PRODUCTS WALKER WASATCH BL	0.0	0.0	0.0	0.0
CONCRETE PRODUCTS WHITEHILL PIT ORC	1.1	0.0	0.4	1.5
CRYSEN	0.2	0.1	10.6	11.0
FLYING J	1.9	27.6	21.1	50.6
GENEVA ROCK 350 W. 3900 SO.	0.3	0.0	0.1	0.5
GENEVA ROCK PT. OF MT.	3.4	0.0	0.0	3.4
HARPER PIT #1	0.0	0.0	0.0	0.0
HARPER PIT #10	0.0	0.0	0.0	0.0
HARSHAW FILTROL	1.5	1.0	5.0	7.5
HERCULES	26.5	0.1	20.1	46.7
INTERSTATE BRICK	4.5	0.0	0.2	4.7
KMC BARNEY'S	0.0	0.0	0.0	0.0
KMC BONN CRUSHER	19.9	0.0	0.0	19.9
KMC COPP CONC.	0.2	9.6	1.3	11.1
KMC MINE	275.6	52.0	337.3	664.9
KMC POWER PLANT	19.8	342.0	250.9	612.7
KMC REFINERY	0.9	0.5	3.0	4.4
KMC TALL STACK	42.9	5,580.0	0.0	5,622.9
KMC LOW LEVEL FUG.	69.1	1,004.4	12.0	1,085.5
LDS HOSPITAL	0.7	9.6	5.9	16.2
LDS WELFARE SQ.	1.0	0.2	0.2	1.3
LONE STAR	0.0	0.0	0.0	0.0
MONROC BECK ST.	5.0	0.0	0.0	5.0
MONROC COTTONWOOD	0.1	0.0	0.5	0.7
MORTON SALT	2.0	0.0	0.5	2.5
MOUNTAIN BELL	0.0	0.0	0.1	0.1
MOUNTAIN FUEL 100S 180W.	0.2	0.1	5.2	5.5
MOUNTIAN FUEL 100S. 1078 W.	0.1	0.0	2.6	2.8



State of Utah

Attachment 5

MEMORANDUM

TO: Technical Support Document

THROUGH: Brock LeBaron

FROM: Bill Reiss

DATE: February 10, 1994

SUBJECT: Estimation of Woodburning Emissions: Method used for CO SIP
vrs. Method Used for PM10 SIP

Woodburning emissions estimates used in both the PM10 SIP and the CO SIP relied on population counts in conjunction with the following wood usage factor: 0.1375 tons wood per person per year. Thus, the starting point was an emissions estimate in terms of mass per year.

Both SIPs, however, require an estimate for a representative "wintertime" month rather than for an entire year. Simply dividing the annual total by 12 would not be representative of a "wintertime" month because people don't burn wood in the summer. Thus, some way of apportioning more of the woodburning emissions toward the winter season is appropriate.

The way this was done in the PM10 SIP was to assign 17.7% of the annual emissions to the monthly inventory (see attached). The equation which arrives at this percentage, and which is contained in the spreadsheet's cell is: $(0.22 + 0.16 + 0.21) \cdot 0.9 / 3$ Where this equation came from or what it means is a mystery to me.

The way the monthly total was derived from the annual emissions estimate for the CO SIP is somewhat different. Using EPA's guidance document "Procedure for the Preparation of Emission Inventories for CO & Precursors of Ozone Volume 1: General Guidance for Stationary Sources" (EPA-450/4-91-016 table 5.8-1), the annual estimate is first inflated by a factor of 1.7, and then the inflated value is divided by 12 months/yr.

In order to compare the two methods it is necessary to put them on equal footing. This will be done three different ways.

First - Converting the 1.7 inflation factor into a percentage such as that used in the PM10 SIP we would get: $1.7 \cdot 1/12 \cdot 100\% = 14.2\%$ We can then compare this number to the 17.7% factor used in the PM10 SIP.

Second - Converting the 17.7% factor into an inflationary factor such as that used in the CO SIP we would get: $.177 \cdot 12 = 2.12$ We can then compare this number to the 1.7 factor used in the CO SIP.

Third - If we assume that woodburners are either burning or they are not we can use the numbers above to see how many months out of the year that they are burning. For the PM10 SIP this would have been: $100\% / 17.7\% = 5.65$ months per year. For the CO SIP this would have been: $100\% / 14.2\% = 7.04$ months per year.

Attachment 6

From: Robert Dalley
To: EQAIR (CDELANEY)
Date: 11/7/94 2:07pm
Subject: 1993 No Burn Data -Reply

1993 Any day or part day that was the color.

SL & DAVIS CO. 18 YELLOW
SL & DAVIS CO. 14 RED

UTAH CO. 17 YELLOW
UTAH CO. 21 RED

Utah

AIR QUALITY RULES

This copy is produced by the Division of Air Quality. The official copy of the Utah Administrative Code will be available at
[HTTP://WWW.RULES.UTAH.GOV](http://www.rules.utah.gov)
after September 1, 2003

EFFECTIVE August 5, 2003

(1) Any person selling or dispensing oxygenated gasoline pursuant to R307-301 is required to label the fuel dispensing system with one of the following notices.

(a) "The gasoline dispensed from this pump is oxygenated and will reduce carbon monoxide pollution from motor vehicles. This fuel contains up to (specify maximum percent by volume) (specific oxygenate or specific combination of oxygenates in concentrations of at least one percent)."

(b) "The gasoline dispensed from this pump is oxygenated and will reduce carbon monoxide pollution from motor vehicles. This fuel contains up to (specify maximum percent by volume) (specific oxygenate or combination of oxygenates present in concentrations of at least one percent) from November 1 through February 29."

(2) The label letters shall be block letters of no less than 20-point type, at least 1/16 inch stroke (width of type), and of a color that contrasts with the label background color. The label letters that specify maximum percent oxygenate by volume and that disclose the specific oxygenate shall be at least 1/2 inch in height, 1/16 inch stroke (width of type).

(3) The label must be affixed to the upper one-half of the vertical surface of the pump on each side with gallonage and dollar amount meters from which gasoline can be dispensed and must be clearly readable to the public.

(4) The retailer or wholesale purchaser-consumer shall be responsible for compliance with R307-301-12.

R307-301-13. Inspections.

Inspections of registered parties, control area retailers, refineries, control area terminals, oxygenate blenders and control area wholesale purchaser-consumers may include the following:

(1) physical sampling, testing, and calculation of oxygen content of the gasoline as specified in R307-301-4;

(2) review of documentation relating to the oxygenated gasoline program, including but not limited to records specified in R307-301-8; and

(3) in the case of control area retailers and wholesale purchaser-consumers, verification that gasoline dispensing pumps are labeled in accordance with R307-301-12.

R307-301-14. Public and Industry Education Program.

The executive secretary shall provide to the affected public, mechanics, and industry information regarding the benefits of the program and other issues related to oxygenated gasoline.

KEY: air pollution control, motor vehicles, gasoline, petroleum

1998

Notice of Continuation April 22, 2002

19-2-101

19-2-104

R307. Environmental Quality, Air Quality.

R307-302. Davis, Salt Lake, Utah Counties: Residential Fireplaces and Stoves.

R307-302-1. Definitions.

The following additional definition applies to R307-302:

"Sole Source of Heat" means the residential solid fuel burning device is the only available source of heat for the entire residence, except for small portable heaters.

R307-302-2. No-Burn Periods for Fine Particulate.

(1) R307-302-2 shall apply only in areas in Utah County which are north of the southernmost border of Payson City, and east of State Route 68, all of Salt Lake County, and areas in Davis County which are south of the southern-most border of Kaysville.

(2) By September 1, 1992, all sole source residential solid fuel burning devices must be registered with the Executive Secretary or local health district office in order to be exempt during mandatory no-burn periods as detailed below.

(3) After September 1, 1992, when the ambient concentration of PM10 measured by the monitors in Salt Lake, Davis, or Utah Counties reaches the level of 120 micrograms per cubic meter and the forecasted weather for the specific area includes a temperature inversion which is predicted to continue for at least 24 hours, the Executive Secretary will issue a public announcement and will distribute such announcement to the local media notifying the public that a mandatory no-burn period for residential solid fuel burning devices and fireplaces is in effect. The mandatory no-burn periods will only apply to those areas or counties impacting the real-time monitoring site registering the 120 micrograms per cubic meter concentration. Residents of Salt Lake County or the affected areas of Davis and Utah Counties shall not use residential solid fuel burning devices or fireplaces except those which are the sole source of heat for the entire residence and registered with the Executive Secretary or the local health district office or those having no visible emissions.

(4) PM10 Contingency Plan. If the PM10 Contingency Plan described in Section IX, Part A, of the State Implementation Plan has been implemented, the following actions will be implemented immediately:

(a) The trigger level for no-burn periods as specified in (3) above will be 110 micrograms per cubic meter for that area where the PM10 Contingency Plan has been implemented; and

(b) In Salt Lake, Davis and Utah County nonattainment areas and in any other nonattainment area, it shall be unlawful to sell or install for use as a solid fuel burning device any used solid fuel burning device that is not approved by the Environmental Protection Agency.

(5) After January 1, 1999, when the ambient concentration of PM2.5 measured by the monitors in Salt Lake, Davis, or Utah Counties reaches the level of 52

micrograms per cubic meter and the forecasted weather for the specific area includes a temperature inversion which is predicted to continue for at least 24 hours, the executive secretary will issue a public announcement and will distribute such announcement to the local media notifying the public that a mandatory no-burn period for residential solid fuel burning devices and fireplaces is in effect. The mandatory no-burn periods will only apply to those areas or counties impacting the real-time monitoring site registering the 52 micrograms per cubic meter concentration. Residents of Salt Lake County or the affected areas of Davis and Utah Counties shall not use residential solid fuel burning devices or fireplaces except those which are the sole source of heat for the entire residence and registered with the Executive Secretary or the local health district office or those having no visible emissions.

R307-302-3. No-Burn Periods for Carbon Monoxide.

- (1) R307-302-3 shall apply only within the city limits of Provo and Orem in Utah County.
- (2) Beginning on November 1 and through March 1 in any years after 1993, the executive secretary will issue a public announcement and will distribute such announcement to the local media notifying the public that a mandatory no-burn period for residential solid fuel burning devices and fireplaces is in effect when the running eight-hour average carbon monoxide concentration as monitored by the state at 4:00 PM reaches a value of 6.0 ppm or more.
- (3) In addition to the conditions contained in (2) above, the executive secretary may use meteorological conditions to initiate a no-burn period. These conditions are:
 - (a) a national weather service forecasted clearing index value of 250 or less;
 - (b) forecasted wind speeds of three miles per hour or less;
 - (c) passage of a vigorous cold front through the Wasatch Front; or
 - (d) arrival of a strong high pressure system into the area.
- (4) During the no-burn periods specified in (2) and (3) above, residents of Provo and Orem Cities shall not use residential solid fuel burning devices or fireplaces except those which are the sole source of heat for the entire residence and are registered with the executive secretary or the local health district office, or those having no visible emissions.

R307-302-4. Violations.

It shall be a violation of R307-302 for any person to operate a residential solid fuel burning device or fireplace during the mandatory no-burn periods except as stated in R307-302-2 or 3.

KEY: air pollution, woodburning*, fireplace*, stove*

1999

19-2-101

19-2-104

R307. Environmental Quality, Air Quality.

R307-305. Davis, Salt Lake and Utah Counties and Ogden City, and Nonattainment Areas for PM10: Particulates.

R307-305-1. Visible Emissions.

(1) In PM10 Nonattainment Areas, visible emissions from existing installations except gasoline powered internal combustion engines, shall be of a shade or density no darker than 20% opacity. Installations in other areas of the State which were constructed before April 25, 1971, except internal combustion engines, shall be of a shade or density no darker than 40% opacity except as provided in these regulations.

(2) Emissions Standards. Other provisions of R307 may require more stringent controls than R307-305, in which case those requirements must be met.

R307-305-2. Particulate Emission Limitations and Operating Parameters (PM10).

All sources with emissions of 25 tons per year or more (combinations of sulfur dioxide, oxides of nitrogen, and PM10) in areas located in or affecting PM10 Nonattainment Areas in Salt Lake and Utah Counties shall meet the emission limitations and operating parameters contained in Section IX, Part H, of the Utah State Implementation Plan (SIP). Existing sources located in or affecting PM10 Nonattainment Areas shall use reasonably available control measures to the extent necessary to insure the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). The emission limitations specified in the SIP constitute, in the judgment of the Board, reasonably available control measures necessary to insure attainment and maintenance of the NAAQS not later than December 31, 1994. Specific limitations for installations within a source listed in the SIP which are not specified will be set by order of the Board. Specific limitations for installations within a source may be adjusted by order of the Board provided the adjustment does not adversely affect achieving the applicable NAAQS.

R307-305-3. Compliance Testing (PM10).

Compliance testing for the PM10, sulfur dioxide, and oxides of nitrogen emission limitations shall be done in accordance with Section IX, Part H of the SIP. PM10 compliance shall be determined from the results of EPA test method 201 or 201a. A backhalf analysis shall be performed for each PM10 compliance test in accordance with a method approved by the Executive Secretary for inventory purposes. For sources not requiring changes to their process or air pollution control devices to achieve compliance with the emission limitations contained in these regulations, compliance testing shall be scheduled with the Executive Secretary within three months after promulgation of R307-305-3. For Utah County sources listed in Section IX, Part H.1, of the SIP which need to make major changes

Volume of Fuelwood Sold in Utah 1991 through 2002
Volume in MBF (1 MBF = 1000 BF)

Year Sold	Ashley	Dixie	Fishlake	Manti Lasa	Uinta	Wasatch	Totals
1991	7140	3236	1399	2344	1612	4046	19777
1992	6707	2871	1293	2150	1432	3216	17669
1993	5761	3411	1556	1949	1390	2295	16362
1994	3947	3008	1296	1515	611	1491	11868
1995	3376	2453	883	1250	618	1237	9817
1996	2845	1916	548	982	428	867	7586
1997	2698	2282	693	853	525	688	7739
1998	2635	2134	653	854	905	729	7910
1999	2595	2165	667	845	883	512	7667
2000	1347	2036	702	3138	364	288	7875
2001	2007	2110	943	1114	594	465	7233
2002	1901	2230	858	1051	527	399	6966

Years 1999 through 2002 from Steve Dribble, USFS, Ogden

AIRCRAFT

A. Calculation of Annual Emissions

There was one airport operating in Salt Lake City during 1993. The Salt Lake City International Airport Authority reports the number of operations occurring at the airport.

The Federal Aviation's software, "Emissions & Dispersion Modeling System (EDMS)," version 4.04 is the foundation for emission factors average over plane types that are typical at the airport. EDMS was run for calendar year 1999 to set a baseline. Back casting is done by ratioing 1999 flight operations to 1993 operations.

(1993 Operations / 1999 Operations) * (1999 CO emissions) = 1993 Annual CO Emissions

$$(355082) / (839914) * (1093.09 \text{ tons/yr}) = 462.11 \text{ tons/yr of CO}$$

B. Calculation of Typical Winter-day Emissions

Airport operations are assumed to be a uniform activity, 365 days a year.

(1993 Annual CO Emissions) / (365 days/yr) = winter day emissions

(462.11 tons/yr) / (365 days/yr) = 1.27 tons/winter day

C. References

1. "Emissions & Dispersion Modeling System (EDMS)," version 4.04
2. "Terminal Area Forecast," Utah Department of Transportation

NON ROAD AIRCRAFT

Direct Output from the EDMS model for calendar year 1999 (as a baseline).

Airport Name	CO tons/year
Salt Lake International	1093.09

	Operations		LTOs		Sum of Operations	
	General Aviation (Loc' & Itin't)	Military	General Aviation	Military (Loc' & Itin't)	General Av & Military	CO tons/year
1999 Activity Level						
Salt Lake International	835882	4032	417941	2016	839914	1093.09

	Operations		LTOs		Sum of Operations	
	General Aviation (Loc' & Itin't)	Military	General Aviation	Military (Loc' & Itin't)	General Av & Military	
1993 Activity Level						
Salt Lake International	349853	5229	174926.5	2614.5		355082

Operations and Emissions for year 1993

Gen Aviation & Military	1993	CO TPY	CO Tons/winter day
Salt Lake International	355082	462.11	1.266
TOTAL		462.11	1.266

TERMINAL AREA FORECAST

425

1999 Based Aircraft:

Location ID: SLC
 Airport: SALT LAKE CITY INTERNATIONAL

Region-State: ANM-UT
 City: SALT LAKE CITY

Year	ENPLANEMENTS										AIRCRAFT OPERATIONS										GA Based Act
	Scheduled Air Carriers	Regional Carriers	Total	Air Carrier	Cargo/Mail	Seats/AC	Load Factor	Enpl/Dep	Regional/Oth	GA	Military	Total	Local Operations	Total OPS	Total Operations	Total Inst OP					
1988	5,198,321	168,291	5,366,612	141,878	19,712	13.88	0.400	5.55	60,804	78,442	6,737	307,373	2,630	310,036	249,232	485					
1989	5,716,390	211,491	5,927,881	143,524	18,050	16.91	0.400	6.77	62,524	82,025	5,318	311,441	2,750	314,217	250,636	475					
1990	5,748,285	219,445	5,967,730	145,212	16,584	16.65	0.400	6.66	65,913	84,272	4,477	316,458	2,825	319,309	253,986	468					
1991	5,982,221	230,797	6,213,018	155,485	22,940	18.11	0.410	7.43	62,167	77,705	4,774	323,071	1,648	324,742	265,228	470					
1992	6,656,604	263,770	6,920,374	162,095	23,550	19.81	0.410	7.71	68,410	83,828	4,525	342,408	856	343,290	279,777	465					
1993	7,826,430	285,495	7,911,925	173,942	24,354	25.00	0.400	8.22	69,481	81,466	5,198	354,441	610	355,079	293,517	459					
1994	8,313,161	454,670	8,767,831	179,279	27,964	30.25	0.400	12.10	75,160	82,873	4,514	369,790	914	370,726	307,885	453					
1995	8,587,002	586,830	9,173,832	186,315	28,417	31.21	0.450	14.05	83,554	84,154	4,517	388,957	850	387,830	324,077	448					
1996	9,777,331	715,591	10,492,922	188,600	27,470	35.70	0.593	21.17	67,600	87,791	4,338	375,799	900	376,621	310,178	442					
1997	9,686,322	779,574	10,465,996	180,445	31,730	35.59	0.590	21.00	74,255	83,643	4,364	374,437	750	376,210	311,915	437					
1998	9,332,152	764,884	10,097,036	174,532	27,764	36.09	0.590	21.30	71,836	87,091	4,225	365,448	700	366,171	300,328	431					
1999	9,053,514	880,107	9,933,621	164,542	32,268	37.29	0.590	22.00	80,010	87,568	3,984	368,372	650	372,165	309,165	425					
2000	9,300,367	900,379	10,200,736	169,543	33,344	37.36	0.595	22.23	81,003	83,400	4,150	371,540	600	378,542	316,292	425					
2001	9,553,915	921,119	10,475,034	174,902	34,457	37.76	0.595	22.46	82,008	82,420	4,150	377,937	580	385,131	323,631	425					
2002	9,814,372	942,336	10,756,708	180,324	35,600	38.15	0.595	22.70	83,025	81,440	4,150	384,546	560	390,939	330,939	425					
2003	10,081,914	966,042	11,045,955	185,914	36,704	38.55	0.595	22.94	84,055	79,460	4,150	390,374	540	397,972	338,722	425					
2004	10,356,734	985,247	11,342,981	191,677	38,022	38.96	0.595	23.18	85,098	78,480	4,150	397,427	520	405,239	346,739	425					
2005	10,639,035	1,008,965	11,648,000	197,519	39,290	39.37	0.595	23.42	86,154	77,500	4,150	404,714	500	412,745	354,995	417					
2006	10,999,946	1,032,205	12,032,151	203,746	40,601	39.78	0.595	23.67	87,223	76,500	4,150	412,220	500	420,489	363,498	408					
2007	11,372,991	1,055,981	12,428,971	210,062	41,955	40.20	0.595	23.92	88,306	75,500	4,150	419,973	500	428,605	372,255	400					
2008	11,758,696	1,080,304	12,839,000	216,574	43,355	40.62	0.595	24.17	89,401	74,500	4,150	427,980	500	436,774	381,274	392					
2009	12,105,077	1,105,188	13,210,265	223,287	44,802	41.04	0.595	24.42	90,511	73,500	4,150	436,248	500	445,314	390,564	384					
2010	12,461,622	1,130,645	13,592,267	230,209	46,296	41.47	0.595	24.68	91,634	72,500	4,150	444,789	500	454,132	400,132	376					
2011	12,828,626	1,156,688	13,985,314	237,348	47,841	41.91	0.595	24.94	92,771	71,500	4,150	453,607	500	463,237	409,887	369					
2012	13,206,396	1,183,331	14,389,728	244,703	49,437	42.35	0.595	25.20	93,922	70,500	4,150	462,712	500	472,837	420,137	362					
2013	13,595,247	1,210,588	14,805,835	252,289	51,086	42.79	0.595	25.46	95,087	69,500	4,150	472,112	500	482,231	430,565	354					
2014	13,995,503	1,238,473	15,233,976	260,110	52,790	43.24	0.595	25.73	96,267	68,389	4,150	481,706	500	492,156	441,310	347					
2015	14,407,496	1,267,000	15,674,496	268,174	54,551	43.70	0.595	26.00	97,462	67,294	4,150	491,631	500	502,422	452,383	340					
2016	14,831,572	1,296,184	16,127,756	276,487	56,371	44.16	0.595	26.27	98,671	66,217	4,150	501,897	500	513,038	463,795	334					
2017	15,268,082	1,326,040	16,594,122	285,058	58,252	44.62	0.595	26.55	99,895	65,158	4,150	512,516	500	525,414	477,708	327					
2018	15,717,390	1,356,584	17,073,974	293,895	60,195	45.09	0.595	26.83	101,135	64,141	4,150	523,516	500	535,414	492,040	320					
2019	16,179,071	1,387,832	17,567,003	303,006	62,203	45.56	0.595	27.11	102,390	63,141	4,150	534,889	500	547,168	506,801	314					
2020	16,655,908	1,419,799	18,075,708	312,399	64,278	46.04	0.595	27.39	103,660	62,156	4,150	546,643	500								

- Notes:
- Historical record from SLCA Air Traffic Statistics and Activity Report. Before 1994 air cargo and air mail were included in air carrier or air taxi operations.
 - Forecast is from 1997 SLCA Master Plan update using the constrained GA forecast. Miscellaneous commercial operations are included in Air Taxi and Commuter forecast.
 - Commuter enplanements are included through 1993; thereafter regional carrier enplanements are shown. Scheduled charter enplanements are included in air carrier or commuter totals.
 - Total enplanements include revenue, non-revenue and connecting passengers on scheduled and non-scheduled flights.
 - Total Inst OPS column assumes that 25% of GA and 100% of all other ops are on IFR flight plan.

addition error on sheet for 1993

MISCELLANEOUS NON-ROAD EQUIPMENT

A. Calculation of Annual Emissions

Emissions for non-road mobile sources are based on EPA's "NONROAD" software. All emissions are taken directly from this model with the exception of equipment that is used at the Salt Lake International Airport and Kennecott Utah Copper Corporation. These two companies are point sources within Salt Lake County. Kennecott Utah Copper Corporation is outside the CO maintenance area. It is estimated that only 5 percent of the emissions from mining and airport emissions reported by the software are not part of the point source emissions. This adjustment has been made to the emissions.

B. Calculation of Typical Winter-day Emissions

Equipment that is normally not run during winter months (i.e. lawnmowers) was eliminated from the total emissions. The emissions were adjusted for equipment ran five, six, or seven days a week during winter months to get the emissions per winter day.

$(\text{CO emissions/number of days ran in year}) * 7 / \text{number of days ran in winter week} = \text{emissions per winter day}$

C. References

1. EPA's "NONROAD" version 4.04 software
2. Salt Lake International Airport point source inventory

NONROAD MISCELLANEOUS EMISSIONS

NONROAD version 8.02

County Name	County Code	SCC	CO-Exhaust	Adjustment Factor	Adjusted Emissions	Fuel	Engine Type (Stroke, Diesel)
Salt Lake	49035	2260001010	201.39	1	201.39	Gasoline	2
Salt Lake	49035	2260001020	0.00	1	0.00	Gasoline	2
Salt Lake	49035	2260001030	30.54	1	30.54	Gasoline	2
Salt Lake	49035	2260001060	62.52	1	62.52	Gasoline	2
Salt Lake	49035	2260002006	719.86	1	719.86	Gasoline	2
Salt Lake	49035	2260002009	42.88	1	42.88	Gasoline	2
Salt Lake	49035	2260002021	51.75	1	51.75	Gasoline	2
Salt Lake	49035	2260002027	0.39	1	0.39	Gasoline	2
Salt Lake	49035	2260002039	1971.79	1	1971.79	Gasoline	2
Salt Lake	49035	2260002054	10.72	1	10.72	Gasoline	2
Salt Lake	49035	2260003030	5.42	1	5.42	Gasoline	2
Salt Lake	49035	2260003040	0.41	1	0.41	Gasoline	2
Salt Lake	49035	2260004015	16.70	1	16.70	Gasoline	2
Salt Lake	49035	2260004016	74.17	1	74.17	Gasoline	2
Salt Lake	49035	2260004020	231.37	1	231.37	Gasoline	2
Salt Lake	49035	2260004021	978.88	1	978.88	Gasoline	2
Salt Lake	49035	2260004025	321.27	1	321.27	Gasoline	2
Salt Lake	49035	2260004026	743.93	1	743.93	Gasoline	2
Salt Lake	49035	2260004030	206.85	1	206.85	Gasoline	2
Salt Lake	49035	2260004031	712.59	1	712.59	Gasoline	2
Salt Lake	49035	2260004035	95.87	1	95.87	Gasoline	2
Salt Lake	49035	2260004036	242.32	1	242.32	Gasoline	2
Salt Lake	49035	2260004071	0.45	1	0.45	Gasoline	2
Salt Lake	49035	2260005035	0.28	1	0.28	Gasoline	2
Salt Lake	49035	2260005050	0.04	1	0.04	Gasoline	2
Salt Lake	49035	2260006005	41.87	1	41.87	Gasoline	2
Salt Lake	49035	2260006010	301.92	1	301.92	Gasoline	2
Salt Lake	49035	2260006015	0.00	1	0.00	Gasoline	2
Salt Lake	49035	2260007005	0.00	0.05	0.00	Gasoline	2

Category Description	Sub-Category Description	Sorting for winter activity	Winter Episode Day Activity	Days Per Week Within Winter	Winter weekday CO Exhaust Emissions
Recreational Equipment	Motorcycles: Off-Road	4	1000000	0	
Recreational Equipment	Snowmobiles	2	92	7	0.000
Recreational Equipment	ATVs	4	1000000	0	
Recreational Equipment	Specialty Vehicles/Carts	4	1000000	0	
Construction and Mining Equip	Tampers/Rammers	3	365	5	2.761
Construction and Mining Equip	Plate Compactors	3	365	5	0.164
Construction and Mining Equip	Paving Equipment	3	365	5	0.198
Construction and Mining Equip	Signal Boards/Light Plants	3	365	5	0.001
Construction and Mining Equip	Concrete/Industrial Saws	3	365	5	7.563
Construction and Mining Equip	Crushing/Proc. Equipment	3	365	5	0.041
Industrial Equipment	Sweepers/Scrubbers	3	365	5	0.021
Industrial Equipment	Other General Industrial Eq	3	365	5	0.002
Lawn and Garden Equipment (	Rotary Tillers < 6 HP	4	1000000	0	
Lawn and Garden Equipment (	Rotary Tillers < 6 HP	4	1000000	0	
Lawn and Garden Equipment (	Chain Saws < 6 HP	4	1000000	0	
Lawn and Garden Equipment (	Chain Saws < 6 HP	4	1000000	0	
Lawn and Garden Equipment (	Trimmers/Edgers/Brush Cutter	4	1000000	0	
Lawn and Garden Equipment (	Trimmers/Edgers/Brush Cutter	4	1000000	0	
Lawn and Garden Equipment (	Leafblowers/Vacuums	4	1000000	0	
Lawn and Garden Equipment (	Leafblowers/Vacuums	4	1000000	0	
Lawn and Garden Equipment (	Snowblowers	1	92	5	1.459
Lawn and Garden Equipment (	Snowblowers	1	92	5	3.687
Lawn and Garden Equipment (	Commercial Turf Equipment	4	1000000	0	
Lawn and Garden Equipment (	Sprayers	4	1000000	0	
Agricultural Equipment	Hydro Power Units	4	1000000	0	
Commercial Equipment	Generator Sets	3	365	5	0.161
Commercial Equipment	Pumps	3	365	5	1.158
Commercial Equipment	Air Compressors	3	365	5	0.000
Logging Equipment	Chain Saws > 6 HP	4	1000000	0	

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County Name	County Code	SCC	CO-Exhaust	Adjustment Factor	Adjusted Emissions	Fuel	Engine Type (Stroke, Diesel)
Salt Lake	49035	2265001010	91.71	1	91.71	Gasoline	4
Salt Lake	49035	2265001030	551.96	1	551.96	Gasoline	4
Salt Lake	49035	2265001050	517.84	1	517.84	Gasoline	4
Salt Lake	49035	2265001060	54.44	1	54.44	Gasoline	4
Salt Lake	49035	2265002003	503.39	1	503.39	Gasoline	4
Salt Lake	49035	2265002006	3.80	1	3.80	Gasoline	4
Salt Lake	49035	2265002009	880.45	1	880.45	Gasoline	4
Salt Lake	49035	2265002015	942.25	1	942.25	Gasoline	4
Salt Lake	49035	2265002021	1747.35	1	1747.35	Gasoline	4
Salt Lake	49035	2265002024	778.26	1	778.26	Gasoline	4
Salt Lake	49035	2265002027	39.43	1	39.43	Gasoline	4
Salt Lake	49035	2265002030	1547.68	1	1547.68	Gasoline	4
Salt Lake	49035	2265002033	456.59	1	456.59	Gasoline	4
Salt Lake	49035	2265002039	3671.22	1	3671.22	Gasoline	4
Salt Lake	49035	2265002042	1513.07	1	1513.07	Gasoline	4
Salt Lake	49035	2265002045	92.61	1	92.61	Gasoline	4
Salt Lake	49035	2265002054	215.49	1	215.49	Gasoline	4
Salt Lake	49035	2265002057	136.93	1	136.93	Gasoline	4
Salt Lake	49035	2265002060	338.99	1	338.99	Gasoline	4
Salt Lake	49035	2265002066	1134.19	1	1134.19	Gasoline	4
Salt Lake	49035	2265002072	637.29	1	637.29	Gasoline	4
Salt Lake	49035	2265002078	236.81	1	236.81	Gasoline	4
Salt Lake	49035	2265002081	121.19	1	121.19	Gasoline	4
Salt Lake	49035	2265003010	404.49	1	404.49	Gasoline	4
Salt Lake	49035	2265003020	1191.82	1	1191.82	Gasoline	4
Salt Lake	49035	2265003030	350.76	1	350.76	Gasoline	4
Salt Lake	49035	2265003040	746.38	1	746.38	Gasoline	4
Salt Lake	49035	2265003050	31.57	1	31.57	Gasoline	4
Salt Lake	49035	2265003060	16.35	1	16.35	Gasoline	4
Salt Lake	49035	2265003070	121.54	1	121.54	Gasoline	4
Salt Lake	49035	2265004010	2197.36	1	2197.36	Gasoline	4
Salt Lake	49035	2265004011	1622.37	1	1622.37	Gasoline	4

Category Description	Sub-Category Description	Sorting for winter activity	Winter Episode Day Activity	Days Per Week Within Winter	Winter weekday CO Exhaust Emissions
Recreational Equipment	Motorcycles: Off-Road	4	1000000	0	
Recreational Equipment	ATVs	4	1000000	0	
Recreational Equipment	Golf Carts	4	1000000	0	
Recreational Equipment	Specialty Vehicles/Carts	4	1000000	0	
Construction and Mining Equip	Pavers	3	365	5	1.931
Construction and Mining Equip	Tampers/Rammers	3	365	5	0.015
Construction and Mining Equip	Plate Compactors	3	365	5	3.377
Construction and Mining Equip	Rollers	3	365	5	3.614
Construction and Mining Equip	Paving Equipment	3	365	5	6.702
Construction and Mining Equip	Surfacing Equipment	3	365	5	2.985
Construction and Mining Equip	Signal Boards/Light Plants	3	365	5	0.151
Construction and Mining Equip	Trenchers	3	365	5	5.936
Construction and Mining Equip	Bore/Drill Rigs	3	365	5	1.751
Construction and Mining Equip	Concrete/Industrial Saws	3	365	5	14.081
Construction and Mining Equip	Cement & Mortar Mixers	3	365	5	5.804
Construction and Mining Equip	Cranes	3	365	5	0.355
Construction and Mining Equip	Crushing/Proc. Equipment	3	365	5	0.827
Construction and Mining Equip	Rough Terrain Forklifts	3	365	5	0.525
Construction and Mining Equip	Rubber Tire Loaders	3	365	5	1.300
Construction and Mining Equip	Tractors/Loaders/Backhoes	3	365	5	4.350
Construction and Mining Equip	Skid Steer Loaders	3	365	5	2.444
Construction and Mining Equip	Dumpers/Tenders	3	365	5	0.908
Construction and Mining Equip	Other Construction Equipment	3	365	5	0.465
Industrial Equipment	Aerial Lifts	3	365	5	1.551
Industrial Equipment	Forklifts	3	365	5	4.571
Industrial Equipment	Sweepers/Scrubbers	3	365	5	1.345
Industrial Equipment	Other General Industrial Eqp	3	365	5	2.863
Industrial Equipment	Other Material Handling Eqp	3	365	5	0.121
Industrial Equipment	AC\Refrigeration	3	365	7	0.045
Industrial Equipment	Terminal Tractors	3	365	5	0.466
Lawn and Garden Equipment (	Lawn mowers	4	1000000	0	
Lawn and Garden Equipment (	Lawn mowers	4	1000000	0	

County Name	County Code	SCC	CO-Exhaust	Adjustment Factor	Adjusted Emissions	Fuel	Engine Type (Stroke, Diesel)
Salt Lake	49035	2265004015	186.06	1	186.06	Gasoline	4
Salt Lake	49035	2265004016	792.37	1	792.37	Gasoline	4
Salt Lake	49035	2265004025	12.48	1	12.48	Gasoline	4
Salt Lake	49035	2265004026	41.74	1	41.74	Gasoline	4
Salt Lake	49035	2265004030	23.88	1	23.88	Gasoline	4
Salt Lake	49035	2265004031	1756.84	1	1756.84	Gasoline	4
Salt Lake	49035	2265004035	102.19	1	102.19	Gasoline	4
Salt Lake	49035	2265004036	258.21	1	258.21	Gasoline	4
Salt Lake	49035	2265004040	508.70	1	508.70	Gasoline	4
Salt Lake	49035	2265004041	209.63	1	209.63	Gasoline	4
Salt Lake	49035	2265004046	231.12	1	231.12	Gasoline	4
Salt Lake	49035	2265004051	91.07	1	91.07	Gasoline	4
Salt Lake	49035	2265004055	6877.82	1	6877.82	Gasoline	4
Salt Lake	49035	2265004056	2867.86	1	2867.86	Gasoline	4
Salt Lake	49035	2265004066	442.04	1	442.04	Gasoline	4
Salt Lake	49035	2265004071	8743.95	1	8743.95	Gasoline	4
Salt Lake	49035	2265004075	217.88	1	217.88	Gasoline	4
Salt Lake	49035	2265004076	247.75	1	247.75	Gasoline	4
Salt Lake	49035	2265005010	0.62	1	0.62	Gasoline	4
Salt Lake	49035	2265005015	2.14	1	2.14	Gasoline	4
Salt Lake	49035	2265005020	0.00	1	0.00	Gasoline	4
Salt Lake	49035	2265005025	1.05	1	1.05	Gasoline	4
Salt Lake	49035	2265005030	0.49	1	0.49	Gasoline	4
Salt Lake	49035	2265005035	4.54	1	4.54	Gasoline	4
Salt Lake	49035	2265005040	10.27	1	10.27	Gasoline	4
Salt Lake	49035	2265005045	1.68	1	1.68	Gasoline	4
Salt Lake	49035	2265005050	3.68	1	3.68	Gasoline	4
Salt Lake	49035	2265005055	2.68	1	2.68	Gasoline	4
Salt Lake	49035	2265005060	3.33	1	3.33	Gasoline	4
Salt Lake	49035	2265006005	7454.38	1	7454.38	Gasoline	4
Salt Lake	49035	2265006010	1753.69	1	1753.69	Gasoline	4
Salt Lake	49035	2265006015	894.41	1	894.41	Gasoline	4

Category Description	Sub-Category Description	Sorting for winter activity	Winter Episode Day Activity	Days Per Week Within Winter	Winter weekday CO Exhaust Emissions
Lawn and Garden Equipment	Rotary Tillers < 6 HP	4	1000000	0	
Lawn and Garden Equipment	Rotary Tillers < 6 HP	4	1000000	0	
Lawn and Garden Equipment	Trimmers/Edgers/Brush Cutter	4	1000000	0	
Lawn and Garden Equipment	Trimmers/Edgers/Brush Cutter	4	1000000	0	
Lawn and Garden Equipment	Leafblowers/Vacuums	4	1000000	0	
Lawn and Garden Equipment	Leafblowers/Vacuums	4	1000000	0	
Lawn and Garden Equipment	Snowblowers	1	92	7	1.111
Lawn and Garden Equipment	Snowblowers	1	92	7	2.807
Lawn and Garden Equipment	Rear Engine Riding Mowers	4	1000000	0	
Lawn and Garden Equipment	Rear Engine Riding Mowers	4	1000000	0	
Lawn and Garden Equipment	Front Mowers	4	1000000	0	
Lawn and Garden Equipment	Shredders < 6 HP	4	1000000	0	
Lawn and Garden Equipment	Lawn & Garden Tractors	4	1000000	0	
Lawn and Garden Equipment	Lawn & Garden Tractors	4	1000000	0	
Lawn and Garden Equipment	Chippers/Stump Grinders	4	1000000	0	
Lawn and Garden Equipment	Commercial Turf Equipment	4	1000000	0	
Lawn and Garden Equipment	Other Lawn & Garden Eqp.	4	1000000	0	
Lawn and Garden Equipment	Other Lawn & Garden Eqp.	4	1000000	0	
Lawn and Garden Equipment	2-Wheel Tractors	4	1000000	0	
Agricultural Equipment	Agricultural Tractors	4	1000000	0	
Agricultural Equipment	Combindes	4	1000000	0	
Agricultural Equipment	Balers	4	1000000	0	
Agricultural Equipment	Agricultural Mowers	4	1000000	0	
Agricultural Equipment	Sprayers	4	1000000	0	
Agricultural Equipment	Tillers > 6 HP	4	1000000	0	
Agricultural Equipment	Swathers	4	1000000	0	
Agricultural Equipment	Hydro Power Units	4	1000000	0	
Agricultural Equipment	Other Agricultural Equipment	4	1000000	0	
Agricultural Equipment	Irrigation Sets	4	1000000	0	
Commercial Equipment	Generator Sets	3	365	5	28.592
Commercial Equipment	Pumps	3	365	5	6.726
Commercial Equipment	Air Compressors	3	365	5	3.431

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County Name	County Code	SCC	CO-Exhaust	Adjustment Factor	Adjusted Emissions	Fuel	Engine Type (Stroke, Diesel)
Salt Lake	49035	2265006025	2188.92	1	2188.92	Gasoline	4
Salt Lake	49035	2265006030	3238.22	1	3238.22	Gasoline	4
Salt Lake	49035	2265007010	0.00	0.05	0.00	Gasoline	4
Salt Lake	49035	2265007015	0.00	0.05	0.00	Gasoline	4
Salt Lake	49035	2265008005	146.11	1	146.11	Gasoline	4
Salt Lake	49035	2265010010	620.34	1	620.34	Gasoline	4
Salt Lake	49035	2267001060	0.47	1	0.47	LPG	all
Salt Lake	49035	2267002003	8.45	1	8.45	LPG	all
Salt Lake	49035	2267002015	14.79	1	14.79	LPG	all
Salt Lake	49035	2267002021	2.15	1	2.15	LPG	all
Salt Lake	49035	2267002024	1.45	1	1.45	LPG	all
Salt Lake	49035	2267002030	26.53	1	26.53	LPG	all
Salt Lake	49035	2267002033	8.55	1	8.55	LPG	all
Salt Lake	49035	2267002039	24.55	1	24.55	LPG	all
Salt Lake	49035	2267002045	8.97	1	8.97	LPG	all
Salt Lake	49035	2267002054	1.48	1	1.48	LPG	all
Salt Lake	49035	2267002057	16.36	1	16.36	LPG	all
Salt Lake	49035	2267002060	41.67	1	41.67	LPG	all
Salt Lake	49035	2267002066	4.57	1	4.57	LPG	all
Salt Lake	49035	2267002072	29.79	1	29.79	LPG	all
Salt Lake	49035	2267002081	13.78	1	13.78	LPG	all
Salt Lake	49035	2267003010	21.74	1	21.74	LPG	all
Salt Lake	49035	2267003020	2065.39	1	2065.39	LPG	all
Salt Lake	49035	2267003030	15.05	1	15.05	LPG	all
Salt Lake	49035	2267003040	5.17	1	5.17	LPG	all
Salt Lake	49035	2267003050	1.08	1	1.08	LPG	all
Salt Lake	49035	2267003070	10.41	1	10.41	LPG	all
Salt Lake	49035	2267004066	20.67	1	20.67	LPG	all
Salt Lake	49035	2267005050	0.00	1	0.00	LPG	all
Salt Lake	49035	2267005055	0.00	1	0.00	LPG	all
Salt Lake	49035	2267005060	0.00	1	0.00	LPG	all
Salt Lake	49035	2267006005	41.95	1	41.95	LPG	all

Category Description	Sub-Category Description	Sorting for winter activity	Winter Episode Day Activity	Days Per Week Within Winter	Winter weekday CO Exhaust Emissions
Commercial Equipment	Welders	3	365	5	8.396
Commercial Equipment	Pressure Washers	3	365	5	12.421
Logging Equipment	Shredders > 6 HP	4	1000000	0	
Logging Equipment	Forest Eq - Feller/Bunch/Skidder	4	1000000	0	
Airport Equipment	Airport Ground Support Equipment	3	365	7	0.400
Industrial Equipment	Other Oil Field Equipment	3	365	7	1.700
Recreational Equipment	Specialty Vehicle Carts	4	1000000	0	
Construction and Mining Equip	Pavers	3	365	5	0.032
Construction and Mining Equip	Rollers	3	365	5	0.057
Construction and Mining Equip	Paving Equipment	3	365	5	0.008
Construction and Mining Equip	Surfacing Equipment	3	365	5	0.006
Construction and Mining Equip	Trenchers	3	365	5	0.102
Construction and Mining Equip	Bore/Drill Rigs	3	365	5	0.033
Construction and Mining Equip	Concrete/Industrial Saws	3	365	5	0.094
Construction and Mining Equip	Cranes	3	365	5	0.034
Construction and Mining Equip	Crushing/Proc. Equipment	3	365	5	0.006
Construction and Mining Equip	Rough Terrain Forklifts	3	365	5	0.063
Construction and Mining Equip	Rubber Tire Loaders	3	365	5	0.160
Construction and Mining Equip	Tractors/Loaders/Backhoes	3	365	5	0.018
Construction and Mining Equip	Skid Steer Loaders	3	365	5	0.114
Construction and Mining Equip	Other Construction Equipment	3	365	5	0.053
Industrial Equipment	Aerial Lifts	3	365	5	0.083
Industrial Equipment	Forklifts	3	365	5	7.922
Industrial Equipment	Sweepers/Scrubbers	3	365	5	0.058
Industrial Equipment	Other General Industrial Equipm	3	365	5	0.020
Industrial Equipment	Other Material Handling Equipment	3	365	5	0.004
Industrial Equipment	Terminal Tractors	3	365	5	0.040
Lawn and Garden Equipment	Chippers/Stump Grinders	4	1000000	0	
Lawn and Garden Equipment	Hydro Power Units	4	1000000	0	
Agricultural Equipment	Other Agricultural Equipment	4	1000000	0	
Agricultural Equipment	Irrigation Sets	4	1000000	0	
Commercial Equipment	Generator Sets	3	365	5	0.161

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County Name	County Code	SCC	CO-Exhaust	Adjustment Factor	Adjusted Emissions	Fuel	Engine Type (Stroke, Diesel)
Salt Lake	49035	2267006010	10.38	1	10.38	LPG	all
Salt Lake	49035	2267006015	12.76	1	12.76	LPG	all
Salt Lake	49035	2267006025	23.79	1	23.79	LPG	all
Salt Lake	49035	2267006030	0.29	1	0.29	LPG	all
Salt Lake	49035	2267008005	8.87	1	8.87	LPG	all
Salt Lake	49035	2268002081	0.72	1	0.72	CNG	all
Salt Lake	49035	2268003020	168.85	1	168.85	CNG	all
Salt Lake	49035	2268003030	0.00	1	0.00	CNG	all
Salt Lake	49035	2268003040	0.00	1	0.00	CNG	all
Salt Lake	49035	2268003060	0.26	1	0.26	CNG	all
Salt Lake	49035	2268003070	0.00	1	0.00	CNG	all
Salt Lake	49035	2268005050	0.00	1	0.00	CNG	all
Salt Lake	49035	2268005055	0.00	1	0.00	CNG	all
Salt Lake	49035	2268005060	1.33	1	1.33	CNG	all
Salt Lake	49035	2268006005	21.01	1	21.01	CNG	all
Salt Lake	49035	2268006010	0.17	1	0.17	CNG	all
Salt Lake	49035	2268006015	1.69	1	1.69	CNG	all
Salt Lake	49035	2268006020	74.65	0.05	3.73	CNG	all
Salt Lake	49035	2268010010	56.08	1	56.08	CNG	all
Salt Lake	49035	2270001060	1.80	1	1.80	Diesel	all
Salt Lake	49035	2270002003	116.98	0.05	5.85	Diesel	all
Salt Lake	49035	2270002006	0.00	1	0.00	Diesel	all
Salt Lake	49035	2270002009	2.82	0.05	0.14	Diesel	all
Salt Lake	49035	2270002015	306.61	0.05	15.33	Diesel	all
Salt Lake	49035	2270002018	355.32	0.05	17.77	Diesel	all
Salt Lake	49035	2270002021	29.43	0.05	1.47	Diesel	all
Salt Lake	49035	2270002024	8.05	0.05	0.40	Diesel	all
Salt Lake	49035	2270002027	22.47	0.05	1.12	Diesel	all
Salt Lake	49035	2270002030	162.65	0.05	8.13	Diesel	all
Salt Lake	49035	2270002033	121.24	0.05	6.06	Diesel	all
Salt Lake	49035	2270002036	1119.75	0.05	55.99	Diesel	all
Salt Lake	49035	2270002039	11.46	0.05	0.57	Diesel	all

Category Description	Sub-Category Description	Sorting for winter activity	Winter Episode Day Activity	Days Per Week Within Winter	Winter weekday CO Exhaust Emissions
Commercial Equipment	Pumps	3	365	5	0.040
Commercial Equipment	Air Compressors	3	365	5	0.049
Commercial Equipment	Welders	3	365	5	0.091
Commercial Equipment	Pressure Washers	3	365	5	0.001
Airport Equipment	Airport Ground Support Equipment	3	365	7	0.024
Construction and Mining Equip	Other Construction Equipment	3	365	5	0.003
Industrial Equipment	Forklifts	3	365	5	0.648
Industrial Equipment	Sweepers/Scrubbers	3	365	5	0.000
Industrial Equipment	Other General Industrial Equipment	3	365	5	0.000
Industrial Equipment	AC\Refrigeration	3	365	7	0.001
Industrial Equipment	Terminal Tractors	3	365	5	0.000
Industrial Equipment	Hydro Power Units	3	365	7	0.000
Agricultural Equipment	Other Agricultural Equipment	3	365	7	0.000
Agricultural Equipment	Irrigation Sets	3	365	7	0.004
Commercial Equipment	Generator Sets	3	365	5	0.081
Commercial Equipment	Pumps	3	365	5	0.001
Commercial Equipment	Air Compressors	3	365	5	0.006
Logging Equipment	Gas Compressors	4	1000000	0	
Industrial Equipment	Other Oil Field Equipment	3	365	7	0.154
Recreational Equipment	Specialty Vehicle Carts	4	1000000	0	
Construction and Mining Equip	Pavers	3	365	5	0.022
Construction and Mining Equip	Tampers/Rammers	3	365	5	0.000
Construction and Mining Equip	Plate Compactors	3	365	5	0.001
Construction and Mining Equip	Rollers	3	365	5	0.059
Construction and Mining Equip	Scrapers	3	365	5	0.068
Construction and Mining Equip	Paving Equipment	3	365	5	0.006
Construction and Mining Equip	Surfacing Equipment	3	365	5	0.002
Construction and Mining Equip	Signal Boards/Light Plants	3	365	5	0.004
Construction and Mining Equip	Trenchers	3	365	5	0.031
Construction and Mining Equip	Bore/Drill Rigs	3	365	5	0.023
Construction and Mining Equip	Excavators	3	365	5	0.215
Construction and Mining Equip	Concrete/Industrial Saws	3	365	5	0.002

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County Name	County Code	SCC	CO-Exhaust	Adjustment Factor	Adjusted Emissions	Fuel	Engine Type (Stroke, Diesel)
Salt Lake	49035	2270002042	5.23	0.05	0.26	Diesel	all
Salt Lake	49035	2270002045	120.96	0.05	6.05	Diesel	all
Salt Lake	49035	2270002048	340.51	0.05	17.03	Diesel	all
Salt Lake	49035	2270002051	985.48	0.05	49.27	Diesel	all
Salt Lake	49035	2270002054	40.10	0.05	2.01	Diesel	all
Salt Lake	49035	2270002057	490.54	0.05	24.53	Diesel	all
Salt Lake	49035	2270002060	1369.98	0.05	68.50	Diesel	all
Salt Lake	49035	2270002066	1335.74	0.05	66.79	Diesel	all
Salt Lake	49035	2270002069	1492.89	0.05	74.64	Diesel	all
Salt Lake	49035	2270002072	915.21	0.05	45.76	Diesel	all
Salt Lake	49035	2270002075	153.21	0.05	7.66	Diesel	all
Salt Lake	49035	2270002078	1.59	0.05	0.08	Diesel	all
Salt Lake	49035	2270002081	184.99	0.05	9.25	Diesel	all
Salt Lake	49035	2270003010	7.09	1	7.09	Diesel	all
Salt Lake	49035	2270003020	57.39	1	57.39	Diesel	all
Salt Lake	49035	2270003030	17.71	1	17.71	Diesel	all
Salt Lake	49035	2270003040	16.97	1	16.97	Diesel	all
Salt Lake	49035	2270003050	1.35	1	1.35	Diesel	all
Salt Lake	49035	2270003060	71.02	1	71.02	Diesel	all
Salt Lake	49035	2270003070	31.94	1	31.94	Diesel	all
Salt Lake	49035	2270004031	0.00	1	0.00	Diesel	all
Salt Lake	49035	2270004036	0.55	1	0.55	Diesel	all
Salt Lake	49035	2270004046	28.84	1	28.84	Diesel	all
Salt Lake	49035	2270004056	3.68	1	3.68	Diesel	all
Salt Lake	49035	2270004066	7.89	1	7.89	Diesel	all
Salt Lake	49035	2270004071	12.00	1	12.00	Diesel	all
Salt Lake	49035	2270004076	0.05	1	0.05	Diesel	all
Salt Lake	49035	2270005010	0.00	1	0.00	Diesel	all
Salt Lake	49035	2270005015	28.63	1	28.63	Diesel	all
Salt Lake	49035	2270005020	1.01	1	1.01	Diesel	all
Salt Lake	49035	2270005025	0.01	1	0.01	Diesel	all
Salt Lake	49035	2270005030	0.00	1	0.00	Diesel	all

Category Description	Sub-Category Description	Sorting for winter activity	Winter Episode Day Activity	Days Per Week Within Winter	Winter weekday CO Exhaust Emissions
Construction and Mining Equip	Cement & Mortar Mixers	3	365	5	0.001
Construction and Mining Equip	Cranes	3	365	5	0.023
Construction and Mining Equip	Graders	3	365	5	0.065
Construction and Mining Equip	Off-highway Trucks	3	365	5	0.189
Construction and Mining Equip	Crushing/Proc. Equipment	3	365	5	0.008
Construction and Mining Equip	Rough Terrain Forklifts	3	365	5	0.094
Construction and Mining Equip	Rubber Tire Loaders	3	365	5	0.263
Construction and Mining Equip	Tractors/Loaders/Backhoes	3	365	5	0.256
Construction and Mining Equip	Crawler Tractor/Dozers	3	365	5	0.286
Construction and Mining Equip	Skid Steer Loaders	3	365	5	0.176
Construction and Mining Equip	Off-Highway Tractors	3	365	5	0.029
Construction and Mining Equip	Dumpers/Tenders	3	365	5	0.000
Construction and Mining Equip	Other Construction Equipment	3	365	5	0.035
Industrial Equipment	Aerial Lifts	3	365	5	0.027
Industrial Equipment	Forklifts	3	365	5	0.220
Industrial Equipment	Sweepers/Scrubbers	3	365	5	0.068
Industrial Equipment	Other General Industrial Eqp	3	365	5	0.065
Industrial Equipment	Other Material Handling Eqp	3	365	5	0.005
Industrial Equipment	AC\Refrigeration	3	365	7	0.195
Industrial Equipment	Terminal Tractors	3	365	5	0.123
Lawn and Garden Equipment	Leafblowers/Vacuums	4	1000000	0	
Lawn and Garden Equipment	Snowblowers	1	92	7	0.006
Lawn and Garden Equipment	Front Mowers	4	1000000	0	
Lawn and Garden Equipment	Lawn & Garden Tractors	4	1000000	0	
Lawn and Garden Equipment	Chippers/Stump Grinders	4	1000000	0	
Lawn and Garden Equipment	Commercial Turf Equipment	4	1000000	0	
Lawn and Garden Equipment	Other Lawn & Garden Eqp.	4	1000000	0	
Agricultural Equipment	2-Wheel Tractors	4	1000000	0	
Agricultural Equipment	Agricultural Tractors	4	1000000	0	
Agricultural Equipment	Combines	4	1000000	0	
Agricultural Equipment	Balers	4	1000000	0	
Agricultural Equipment	Agricultural Mowers	4	1000000	0	

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County Name	County Code	SCC	CO-Exhaust	Adjustment Factor	Adjusted Emissions	Fuel	Engine Type (Stroke, Diesel)
Salt Lake	49035	2270005035	0.16	1	0.16	Diesel	all
Salt Lake	49035	2270005040	0.00	1	0.00	Diesel	all
Salt Lake	49035	2270005045	0.09	1	0.09	Diesel	all
Salt Lake	49035	2270005050	0.03	1	0.03	Diesel	all
Salt Lake	49035	2270005055	0.53	1	0.53	Diesel	all
Salt Lake	49035	2270005060	0.24	1	0.24	Diesel	all
Salt Lake	49035	2270006005	70.11	1	70.11	Diesel	all
Salt Lake	49035	2270006010	15.53	1	15.53	Diesel	all
Salt Lake	49035	2270006015	41.40	1	41.40	Diesel	all
Salt Lake	49035	2270006020	0.00	1	0.00	Diesel	all
Salt Lake	49035	2270006025	51.96	1	51.96	Diesel	all
Salt Lake	49035	2270006030	2.00	1	2.00	Diesel	all
Salt Lake	49035	2270007010	0.00	1	0.00	Diesel	all
Salt Lake	49035	2270007015	0.00	1	0.00	Diesel	all
Salt Lake	49035	2270008005	46.32	1	46.32	Diesel	all
Salt Lake	49035	2270009010	0.00	1	0.00	Diesel	all
Salt Lake	49035	2270010010	24.74	1	24.74	Diesel	all
Salt Lake	49035	2282005010	159.94	1	159.94	Gasoline	2
Salt Lake	49035	2282005015	68.88	1	68.88	Gasoline	2
Salt Lake	49035	2282010005	106.06	1	106.06	Gasoline	2
Salt Lake	49035	2282020005	0.47	1	0.47	Diesel	all
Salt Lake	49035	2282020010	0.02	1	0.02	Diesel	all
Salt Lake	49035	2285002015	7.57	1	7.57	Diesel	all
Salt Lake	49035	2285004015	20.49	1	20.49	Gasoline	4
Salt Lake	49035	2285006015	0.07	1	0.07	LPG	all
			83263.48				

Salt Lake City 1993 Population 160233.00
Salt Lake County 1993 Population 791724.00
Ratio 0.20

Category Description	Sub-Category Description	Sorting for winter activity	Winter Episode Day Activity	Days Per Week Within Winter	Winter weekday CO Exhaust Emissions
Agricultural Equipment	Sprayers	4	1000000	0	
Agricultural Equipment	Tillers > 6 HP	4	1000000	0	
Agricultural Equipment	Swathers	4	1000000	0	
Agricultural Equipment	Hydro Power Units	4	1000000	0	
Agricultural Equipment	Other Agricultural Equipment	4	1000000	0	
Agricultural Equipment	Irrigation Sets	4	1000000	0	
Commercial Equipment	Generator Sets	3	365	5	0.269
Commercial Equipment	Pumps	3	365	5	0.060
Commercial Equipment	Air Compressors	3	365	5	0.159
Commercial Equipment	Gas Compressors	3	365	5	0.000
Commercial Equipment	Welders	3	365	5	0.199
Commercial Equipment	Pressure Washers	3	365	5	0.008
Commercial Equipment	Shredders > 6 HP	4	1000000	0	
Logging Equipment	Forest Eq - Feller/Bunch/Skidder	4	1000000	0	
Logging Equipment	Airport Ground Support Equipment	3	365	7	0.127
Airport Equipment	Other Underground Mining Equipment	3	365	5	0.000
Construction and Mining Equip	Other Oil Field Equipment	3	365	7	0.068
Industrial Equipment	Outboard	4	1000000	0	
Pleasure Craft	Personal Water Craft	4	1000000	0	
Pleasure Craft	Inboard/Sterndrive	4	1000000	0	
Pleasure Craft	Inboard/Sterndrive	4	1000000	0	
Pleasure Craft	Outboards	4	1000000	0	
Pleasure Craft	Railway Maintenance	3	365	7	0.021
Railroad Equipment	Railway Maintenance	3	365	7	0.056
Railroad Equipment	Railway Maintenance	3	365	7	0.000
Railroad Equipment	Railway Maintenance	3	365	7	0.000
Salt Lake County winter-day					164.99
Salt Lake City winter-day					33.39

Emission Totals by SCC and Pollutant

Salt Lake County

Tons/Year

All Fuels

ANNUAL93
SALT LAKE CTY 1993

Total for year: 1993

Today's Date: 6/29/2004

Date of Model Run: Apr 30 14:47:49: 2004

SCC	Equipment Description	Engine Type	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM10	Exhaust SOx	Exhaust CO2
AGRICULTURAL EQUIPMENT								
2260005035*	Sprayers	2 Stroke	0.10	0.00	0.28	0.00	0.00	0.36
2260005050*	Hydro Power Units	2 Stroke	0.01	0.00	0.04	0.00	0.00	0.04
2265005010*	2-Wheel Tractors	4 Stroke	0.01	0.00	0.62	0.00	0.00	1.09
2265005015*	Agricultural Tractors	4 Stroke	0.05	0.03	2.14	0.00	0.00	4.82
2265005020*	Combines	4 Stroke	0.00	0.00	0.00	0.00	0.00	0.00
2265005025*	Balers	4 Stroke	0.03	0.02	1.05	0.00	0.00	2.56
2265005030*	Agricultural Mowers	4 Stroke	0.01	0.00	0.49	0.00	0.00	0.91
2265005035*	Sprayers	4 Stroke	0.23	0.03	4.54	0.00	0.00	9.38
2265005040*	Tillers > 6 HP	4 Stroke	0.23	0.03	10.27	0.00	0.00	19.26
2265005045*	Swathers	4 Stroke	0.04	0.03	1.68	0.00	0.00	4.08
2265005050*	Hydro Power Units	4 Stroke	0.14	0.01	3.68	0.00	0.00	6.54
2265005055*	Other Agricultural Equipment	4 Stroke	0.07	0.04	2.68	0.00	0.00	5.98
2265005060*	Irrigation Sets	4 Stroke	0.09	0.07	3.33	0.00	0.00	7.89
2267005050*	Hydro Power Units	LPG	0.00	0.00	0.00	0.00	0.00	0.00
2267005055*	Other Agricultural Equipment	LPG	0.00	0.00	0.00	0.00	0.00	0.00
2267005060*	Irrigation Sets	LPG	0.00	0.00	0.00	0.00	0.00	0.00
2268005050*	Hydro Power Units	CNG	0.00	0.00	0.00	0.00	0.00	0.00
2268005055*	Other Agricultural Equipment	CNG	0.00	0.00	0.00	0.00	0.00	0.00
2268005060*	Irrigation Sets	CNG	0.00	0.32	1.33	0.00	0.00	13.15
2270005010	2-Wheel Tractors	Diesel	0.00	0.00	0.00	0.00	0.00	0.10
2270005015	Agricultural Tractors	Diesel	6.36	40.58	28.63	6.47	3.33	2,341.44
2270005020	Combines	Diesel	0.27	2.96	1.01	0.57	0.21	149.59

Emission Totals by SCC and Pollutant

Salt Lake County

Tons/Year

All Fuels

ANNUAL93
SALT LAKE CTY 1993

Total for year: 1993

Today's Date: 6/29/2004

Date of Model Run: Apr 30 14:47:49: 2004

SCC	Equipment Description	Engine Type	Crankcase VOC	Diurnal VOC	Vapor Displacement VOC	Spillage VOC	Total VOC
AGRICULTURAL EQUIPMENT							
2260005035*	Sprayers	2 Stroke	0.00	0.00	0.00	0.00	0.11
2260005050*	Hydro Power Units	2 Stroke	0.00	0.00	0.00	0.00	0.01
2265005010*	2-Wheel Tractors	4 Stroke	0.00	0.00	0.00	0.00	0.02
2265005015*	Agricultural Tractors	4 Stroke	0.02	0.00	0.00	0.00	0.07
2265005020*	Combines	4 Stroke	0.00	0.00	0.00	0.00	0.00
2265005025*	Balers	4 Stroke	0.01	0.01	0.00	0.00	0.05
2265005030*	Agricultural Mowers	4 Stroke	0.00	0.00	0.00	0.00	0.02
2265005035*	Sprayers	4 Stroke	0.05	0.02	0.00	0.00	0.31
2265005040*	Tillers > 6 HP	4 Stroke	0.08	0.01	0.01	0.01	0.34
2265005045*	Swathers	4 Stroke	0.01	0.01	0.00	0.00	0.07
2265005050*	Hydro Power Units	4 Stroke	0.04	0.00	0.00	0.00	0.19
2265005055*	Other Agricultural Equipment	4 Stroke	0.02	0.01	0.00	0.00	0.10
2265005060*	Irrigation Sets	4 Stroke	0.03	0.00	0.00	0.00	0.13
2267005050*	Hydro Power Units	LPG	0.00	0.00	0.00	0.00	0.00
2267005055*	Other Agricultural Equipment	LPG	0.00	0.00	0.00	0.00	0.00
2267005060*	Irrigation Sets	LPG	0.00	0.00	0.00	0.00	0.00
2268005050*	Hydro Power Units	CNG	0.00	0.00	0.00	0.00	0.00
2268005055*	Other Agricultural Equipment	CNG	0.00	0.00	0.00	0.00	0.00
2268005060*	Irrigation Sets	CNG	0.00	0.00	0.00	0.00	0.01
2270005010	2-Wheel Tractors	Diesel	0.00	0.00	0.00	0.00	0.00
2270005015	Agricultural Tractors	Diesel	0.13	0.00	0.00	0.00	6.49
2270005020	Combines	Diesel	0.01	0.00	0.00	0.00	0.28

SCC	Equipment Description	Engine Type	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM10	Exhaust SOx	Exhaust CO2
2270005025	Balers	Diesel	0.01	0.02	0.01	0.00	0.00	1.28
2270005030	Agricultural Mowers	Diesel	0.00	0.00	0.00	0.00	0.00	0.00
2270005035	Sprayers	Diesel	0.06	0.20	0.16	0.05	0.02	14.59
2270005040	Tillers > 6 HP	Diesel	0.00	0.00	0.00	0.00	0.00	0.00
2270005045	Swathers	Diesel	0.02	0.24	0.09	0.05	0.02	13.65
2270005050	Hydro Power Units	Diesel	0.01	0.05	0.03	0.01	0.01	4.17
2270005055	Other Agricultural Equipment	Diesel	0.13	0.78	0.53	0.15	0.06	42.94
2270005060	Irrigation Sets	Diesel	0.11	0.49	0.24	0.09	0.05	34.99
	Agricultural Equipment Totals:		8.02	45.91	62.84	7.39	3.71	2,678.81
AIRPORT EQUIPMENT								
2265008005*	Airport Ground Support Equipment	4 Stroke	5.65	2.06	146.11	0.07	0.06	312.48
2267008005*	Airport Ground Support Equipment	LPG	0.45	2.23	8.87	0.01	0.00	124.98
2270008005	Airport Ground Support Equipment	Diesel	9.74	99.66	46.32	10.29	7.28	5,124.26
	Airport Equipment Totals:		15.84	103.96	201.29	10.37	7.35	5,561.72
COMMERCIAL EQUIPMENT								
2260006005*	Generator Sets	2 Stroke	15.72	0.05	41.87	0.45	0.01	53.73
2260006010*	Pumps	2 Stroke	113.40	0.33	301.92	3.23	0.07	341.75
2260006015*	Air Compressors	2 Stroke	0.00	0.00	0.00	0.00	0.00	0.00
2265006005*	Generator Sets	4 Stroke	214.15	22.72	7,454.38	1.18	2.92	14,170.69
2265006010*	Pumps	4 Stroke	88.06	7.89	1,753.69	0.28	0.75	3,654.18
2265006015*	Air Compressors	4 Stroke	45.57	5.94	894.41	0.66	0.37	1,820.79
2265006025*	Welders	4 Stroke	56.59	9.92	2,188.92	0.53	0.81	3,937.43
2265006030*	Pressure Washers	4 Stroke	199.60	8.84	3,238.22	3.12	1.27	6,202.12
2267006005*	Generator Sets	LPG	2.39	15.41	41.95	0.07	0.02	865.45
2267006010*	Pumps	LPG	0.59	3.81	10.38	0.02	0.00	213.80
2267006015*	Air Compressors	LPG	0.73	4.66	12.76	0.02	0.01	261.73
2267006025*	Welders	LPG	1.21	6.01	23.79	0.03	0.01	336.39
2267006030*	Pressure Washers	LPG	0.01	0.07	0.29	0.00	0.00	4.14
2268006005*	Generator Sets	CNG	0.07	7.70	21.01	0.04	0.01	335.95
2268006010*	Pumps	CNG	0.00	0.06	0.17	0.00	0.00	2.78
2268006015*	Air Compressors	CNG	0.01	0.62	1.69	0.00	0.00	26.88

SCC	Equipment Description	Engine Type	Crankcase VOC	Diurnal VOC	Vapor Displacement VOC	Spillage VOC	Total VOC
2270005025	Balers	Diesel	0.00	0.00	0.00	0.00	0.01
2270005030	Agricultural Mowers	Diesel	0.00	0.00	0.00	0.00	0.00
2270005035	Sprayers	Diesel	0.00	0.00	0.00	0.00	0.06
2270005040	Tillers > 6 HP	Diesel	0.00	0.00	0.00	0.00	0.00
2270005045	Swathers	Diesel	0.00	0.00	0.00	0.00	0.02
2270005050	Hydro Power Units	Diesel	0.00	0.00	0.00	0.00	0.01
2270005055	Other Agricultural Equipment	Diesel	0.00	0.00	0.00	0.00	0.14
2270005060	Irrigation Sets	Diesel	0.00	0.00	0.00	0.00	0.11
	Agricultural Equipment Totals:		0.41	0.07	0.02	0.02	8.54
AIRPORT EQUIPMENT							
2265008005*	Airport Ground Support Equipment	4 Stroke	1.50	0.11	0.12	0.01	7.39
2267008005*	Airport Ground Support Equipment	LPG	0.15	0.00	0.00	0.00	0.60
2270008005	Airport Ground Support Equipment	Diesel	0.19	0.00	0.00	0.00	9.93
	Airport Equipment Totals:		1.84	0.11	0.12	0.01	17.93
COMMERCIAL EQUIPMENT							
2260006005*	Generator Sets	2 Stroke	0.00	0.09	0.04	0.25	16.11
2260006010*	Pumps	2 Stroke	0.00	0.32	0.29	1.69	115.70
2260006015*	Air Compressors	2 Stroke	0.00	0.00	0.00	0.00	0.00
2265006005*	Generator Sets	4 Stroke	70.25	16.61	5.55	7.41	313.97
2265006010*	Pumps	4 Stroke	29.06	1.73	1.49	4.62	124.96
2265006015*	Air Compressors	4 Stroke	10.82	0.58	0.73	1.17	58.88
2265006025*	Welders	4 Stroke	17.11	0.89	1.53	3.25	79.39
2265006030*	Pressure Washers	4 Stroke	43.85	4.13	2.62	7.89	258.09
2267006005*	Generator Sets	LPG	0.79	0.00	0.00	0.00	3.18
2267006010*	Pumps	LPG	0.20	0.00	0.00	0.00	0.79
2267006015*	Air Compressors	LPG	0.24	0.00	0.00	0.00	0.97
2267006025*	Welders	LPG	0.40	0.00	0.00	0.00	1.62
2267006030*	Pressure Washers	LPG	0.00	0.00	0.00	0.00	0.02
2268006005*	Generator Sets	CNG	0.02	0.00	0.00	0.00	0.09
2268006010*	Pumps	CNG	0.00	0.00	0.00	0.00	0.00
2268006015*	Air Compressors	CNG	0.00	0.00	0.00	0.00	0.01

SCC	Equipment Description	Engine Type	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM10	Exhaust SOx	Exhaust CO2
2268006020*	Gas Compressors	CNG	0.22	16.68	74.65	0.09	0.01	673.47
2270006005	Generator Sets	Diesel	18.71	108.63	70.11	14.81	10.82	7,615.51
2270006010	Pumps	Diesel	4.01	24.51	15.53	3.34	2.45	1,726.36
2270006015	Air Compressors	Diesel	10.55	69.14	41.40	9.01	7.21	5,078.16
2270006020	Gas Compressors	Diesel	0.00	0.00	0.00	0.00	0.00	0.00
2270006025	Welders	Diesel	13.89	32.10	51.96	8.10	3.70	2,602.79
2270006030	Pressure Washers	Diesel	0.55	3.14	2.00	0.41	0.31	215.58
	Commercial Equipment Totals:		786.05	348.23	16,241.09	45.38	30.75	50,139.71

CONSTRUCTION AND MINING EQUIPMENT

2260002006*	Tampers/Rammers	2 Stroke	228.86	1.18	719.86	10.68	0.19	921.45
2260002009*	Plate Compactors	2 Stroke	16.10	0.05	42.88	0.46	0.01	53.71
2260002021*	Paving Equipment	2 Stroke	19.43	0.06	51.75	0.55	0.01	64.03
2260002027*	Signal Boards/Light Plants	2 Stroke	0.14	0.00	0.39	0.00	0.00	0.44
2260002039*	Concrete/Industrial Saws	2 Stroke	639.09	2.97	1,971.79	28.38	0.46	2,279.29
2260002054*	Crushing/Proc. Equipment	2 Stroke	4.02	0.01	10.72	0.11	0.00	12.13
2265002003*	Pavers	4 Stroke	14.19	2.61	503.39	0.14	0.19	923.41
2265002006*	Tampers/Rammers	4 Stroke	0.09	0.01	3.80	0.00	0.00	6.84
2265002009*	Plate Compactors	4 Stroke	75.42	2.27	880.45	1.27	0.36	1,731.08
2265002015*	Rollers	4 Stroke	22.84	4.64	942.25	0.20	0.34	1,643.85
2265002021*	Paving Equipment	4 Stroke	81.28	5.16	1,747.35	1.15	0.67	3,271.78
2265002024*	Surfacing Equipment	4 Stroke	33.48	2.29	778.26	0.45	0.28	1,377.82
2265002027*	Signal Boards/Light Plants	4 Stroke	2.47	0.10	39.43	0.04	0.01	70.65
2265002030*	Trenchers	4 Stroke	66.38	7.96	1,547.68	0.89	0.59	2,866.02
2265002033*	Bore/Drill Rigs	4 Stroke	44.51	2.39	456.59	0.77	0.20	963.97
2265002039*	Concrete/Industrial Saws	4 Stroke	89.14	12.95	3,671.22	0.77	1.24	6,003.79
2265002042*	Cement & Mortar Mixers	4 Stroke	76.78	4.23	1,513.07	1.14	0.59	2,887.33
2265002045*	Cranes	4 Stroke	2.26	1.56	92.61	0.02	0.04	209.25
2265002054*	Crushing/Proc. Equipment	4 Stroke	8.63	0.79	215.49	0.11	0.08	387.34
2265002057*	Rough Terrain Forklifts	4 Stroke	3.35	2.74	136.93	0.03	0.07	325.63
2265002060*	Rubber Tire Loaders	4 Stroke	8.30	6.94	338.99	0.07	0.17	808.67
2265002066*	Tractors/Loaders/Backhoes	4 Stroke	27.37	3.80	1,134.19	0.24	0.41	1,986.65
2265002072*	Skid Steer Loaders	4 Stroke	15.46	6.77	637.29	0.13	0.27	1,309.25

SCC	Equipment Description	Engine Type	Crankcase VOC	Diurnal VOC	Vapor Displacement VOC	Spillage VOC	Total VOC
2268006020*	Gas Compressors	CNG	0.07	0.00	0.00	0.00	0.29
2270006005	Generator Sets	Diesel	0.37	0.00	0.00	0.00	19.09
2270006010	Pumps	Diesel	0.08	0.00	0.00	0.00	4.09
2270006015	Air Compressors	Diesel	0.21	0.00	0.00	0.00	10.76
2270006020	Gas Compressors	Diesel	0.00	0.00	0.00	0.00	0.00
2270006025	Welders	Diesel	0.28	0.00	0.00	0.00	14.17
2270006030	Pressure Washers	Diesel	0.01	0.00	0.00	0.00	0.56
	Commercial Equipment Totals:		173.77	24.36	12.26	26.29	1,022.72

CONSTRUCTION AND MINING EQUIPMENT

2260002006*	Tampers/Rammers	2 Stroke	0.00	0.95	0.64	0.75	231.19
2260002009*	Plate Compactors	2 Stroke	0.00	0.09	0.04	0.05	16.28
2260002021*	Paving Equipment	2 Stroke	0.00	0.09	0.05	0.05	19.62
2260002027*	Signal Boards/Light Plants	2 Stroke	0.00	0.00	0.00	0.00	0.15
2260002039*	Concrete/Industrial Saws	2 Stroke	0.00	0.94	1.66	0.89	642.58
2260002054*	Crushing/Proc. Equipment	2 Stroke	0.00	0.01	0.01	0.01	4.05
2265002003*	Pavers	4 Stroke	4.14	0.26	0.34	0.19	19.12
2265002006*	Tampers/Rammers	4 Stroke	0.03	0.00	0.00	0.00	0.13
2265002009*	Plate Compactors	4 Stroke	15.37	0.56	0.70	0.83	92.88
2265002015*	Rollers	4 Stroke	7.14	0.47	0.61	0.09	31.16
2265002021*	Paving Equipment	4 Stroke	19.38	2.72	1.25	0.51	105.14
2265002024*	Surfacing Equipment	4 Stroke	8.27	0.52	0.53	0.20	43.00
2265002027*	Signal Boards/Light Plants	4 Stroke	0.55	0.02	0.03	0.02	3.08
2265002030*	Trenchers	4 Stroke	16.53	1.07	1.09	0.36	85.43
2265002033*	Bore/Drill Rigs	4 Stroke	8.87	1.16	0.39	0.27	55.20
2265002039*	Concrete/Industrial Saws	4 Stroke	27.78	1.34	2.22	0.43	120.90
2265002042*	Cement & Mortar Mixers	4 Stroke	17.73	5.67	1.11	0.32	101.61
2265002045*	Cranes	4 Stroke	0.74	0.16	0.08	0.00	3.24
2265002054*	Crushing/Proc. Equipment	4 Stroke	2.19	0.20	0.15	0.04	11.20
2265002057*	Rough Terrain Forklifts	4 Stroke	1.11	0.19	0.12	0.00	4.77
2265002060*	Rubber Tire Loaders	4 Stroke	2.74	0.34	0.29	0.01	11.69
2265002066*	Tractors/Loaders/Backhoes	4 Stroke	8.50	0.49	0.73	0.08	37.16
2265002072*	Skid Steer Loaders	4 Stroke	4.92	0.93	0.48	0.04	21.83

SCC	Equipment Description	Engine Type	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM10	Exhaust SOx	Exhaust CO2
2265002078*	Dumpers/Tenders	4 Stroke	8.10	0.74	236.81	0.10	0.09	442.82
2265002081*	Other Construction Equipment	4 Stroke	2.97	2.46	121.19	0.02	0.06	289.83
2267002003*	Pavers	LPG	0.43	2.12	8.45	0.01	0.00	118.54
2267002015*	Rollers	LPG	0.75	3.70	14.79	0.02	0.00	206.63
2267002021*	Paving Equipment	LPG	0.11	0.54	2.15	0.00	0.00	30.25
2267002024*	Surfacing Equipment	LPG	0.07	0.36	1.45	0.00	0.00	20.26
2267002030*	Trenchers	LPG	1.35	6.65	26.53	0.03	0.01	371.89
2267002033*	Bore/Drill Rigs	LPG	0.44	2.15	8.55	0.01	0.00	120.55
2267002039*	Concrete/Industrial Saws	LPG	1.25	6.07	24.55	0.03	0.01	339.22
2267002045*	Cranes	LPG	0.46	2.26	8.97	0.01	0.00	126.23
2267002054*	Crushing/Proc. Equipment	LPG	0.08	0.37	1.48	0.00	0.00	20.78
2267002057*	Rough Terrain Forklifts	LPG	0.83	4.11	16.36	0.02	0.00	229.81
2267002060*	Rubber Tire Loaders	LPG	2.12	10.42	41.67	0.05	0.01	582.94
2267002066*	Tractors/Loaders/Backhoes	LPG	0.23	1.14	4.57	0.01	0.00	63.71
2267002072*	Skid Steer Loaders	LPG	1.52	7.48	29.79	0.03	0.01	418.70
2267002081*	Other Construction Equipment	LPG	0.70	3.47	13.78	0.02	0.00	194.11
2268002081*	Other Construction Equipment	CNG	0.00	0.18	0.72	0.00	0.00	7.55
2270002003	Pavers	Diesel	20.34	175.30	116.98	20.24	16.32	11,490.86
2270002006	Tampers/Rammers	Diesel	0.00	0.00	0.00	0.00	0.00	0.00
2270002009	Plate Compactors	Diesel	0.87	4.96	2.82	0.61	0.43	300.57
2270002015	Rollers	Diesel	56.67	455.68	306.61	55.28	45.02	31,693.85
2270002018	Scrapers	Diesel	54.66	664.32	355.32	71.57	61.72	43,451.18
2270002021	Paving Equipment	Diesel	4.92	40.52	29.43	4.83	3.53	2,487.68
2270002024	Surfacing Equipment	Diesel	1.46	9.81	8.05	1.33	0.90	634.23
2270002027	Signal Boards/Light Plants	Diesel	6.92	36.27	22.47	4.63	3.47	2,440.92
2270002030	Trenchers	Diesel	30.50	186.55	162.65	27.09	18.90	13,307.23
2270002033	Bore/Drill Rigs	Diesel	27.43	271.92	121.24	25.54	20.01	14,086.75
2270002036	Excavators	Diesel	183.97	2,030.77	1,119.75	195.66	184.85	130,131.08
2270002039	Concrete/Industrial Saws	Diesel	2.26	12.29	11.46	1.85	1.28	902.71
2270002042	Cement & Mortar Mixers	Diesel	1.37	10.52	5.23	1.11	0.84	589.71
2270002045	Cranes	Diesel	38.91	423.22	120.96	36.43	34.17	24,054.76
2270002048	Graders	Diesel	73.47	681.42	340.51	57.23	62.04	43,676.29
2270002051	Off-highway Trucks	Diesel	177.78	1,943.94	985.48	145.86	179.33	126,243.63

SCC	Equipment Description	Engine Type	Crankcase VOC	Diurnal VOC	Vapor Displacement VOC	Spillage VOC	Total VOC
2265002078*	Dumpers/Tenders	4 Stroke	2.15	0.81	0.17	0.05	11.27
2265002081*	Other Construction Equipment	4 Stroke	0.98	0.25	0.11	0.00	4.31
2267002003*	Pavers	LPG	0.14	0.00	0.00	0.00	0.57
2267002015*	Rollers	LPG	0.25	0.00	0.00	0.00	1.00
2267002021*	Paving Equipment	LPG	0.04	0.00	0.00	0.00	0.15
2267002024*	Surfacing Equipment	LPG	0.02	0.00	0.00	0.00	0.10
2267002030*	Trenchers	LPG	0.45	0.00	0.00	0.00	1.80
2267002033*	Bore/Drill Rigs	LPG	0.14	0.00	0.00	0.00	0.58
2267002039*	Concrete/Industrial Saws	LPG	0.41	0.00	0.00	0.00	1.66
2267002045*	Cranes	LPG	0.15	0.00	0.00	0.00	0.61
2267002054*	Crushing/Proc. Equipment	LPG	0.02	0.00	0.00	0.00	0.10
2267002057*	Rough Terrain Forklifts	LPG	0.28	0.00	0.00	0.00	1.11
2267002060*	Rubber Tire Loaders	LPG	0.70	0.00	0.00	0.00	2.82
2267002066*	Tractors/Loaders/Backhoes	LPG	0.08	0.00	0.00	0.00	0.31
2267002072*	Skid Steer Loaders	LPG	0.50	0.00	0.00	0.00	2.02
2267002081*	Other Construction Equipment	LPG	0.23	0.00	0.00	0.00	0.93
2268002081*	Other Construction Equipment	CNG	0.00	0.00	0.00	0.00	0.00
2270002003	Pavers	Diesel	0.41	0.00	0.00	0.00	20.74
2270002006	Tampers/Rammers	Diesel	0.00	0.00	0.00	0.00	0.00
2270002009	Plate Compactors	Diesel	0.02	0.00	0.00	0.00	0.88
2270002015	Rollers	Diesel	1.13	0.00	0.00	0.00	57.80
2270002018	Scrapers	Diesel	1.09	0.00	0.00	0.00	55.76
2270002021	Paving Equipment	Diesel	0.10	0.00	0.00	0.00	5.02
2270002024	Surfacing Equipment	Diesel	0.03	0.00	0.00	0.00	1.49
2270002027	Signal Boards/Light Plants	Diesel	0.14	0.00	0.00	0.00	7.06
2270002030	Trenchers	Diesel	0.61	0.00	0.00	0.00	31.11
2270002033	Bore/Drill Rigs	Diesel	0.55	0.00	0.00	0.00	27.98
2270002036	Excavators	Diesel	3.68	0.00	0.00	0.00	187.65
2270002039	Concrete/Industrial Saws	Diesel	0.05	0.00	0.00	0.00	2.31
2270002042	Cement & Mortar Mixers	Diesel	0.03	0.00	0.00	0.00	1.39
2270002045	Cranes	Diesel	0.78	0.00	0.00	0.00	39.68
2270002048	Graders	Diesel	1.47	0.00	0.00	0.00	74.94
2270002051	Off-highway Trucks	Diesel	3.56	0.00	0.00	0.00	181.33

SCC	Equipment Description	Engine Type	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM10	Exhaust SOx	Exhaust CO2
2270002054	Crushing/Proc. Equipment	Diesel	9.34	91.38	40.10	8.33	7.31	5,147.50
2270002057	Rough Terrain Forklifts	Diesel	84.23	530.06	490.54	85.61	57.74	40,650.97
2270002060	Rubber Tire Loaders	Diesel	234.73	2,794.56	1,369.98	295.21	241.06	169,703.00
2270002066	Tractors/Loaders/Backhoes	Diesel	337.68	1,461.01	1,335.74	219.52	133.35	93,887.26
2270002069	Crawler Tractor/Dozers	Diesel	300.11	2,987.45	1,492.89	273.31	260.93	183,693.61
2270002072	Skid Steer Loaders	Diesel	267.76	689.14	915.21	149.48	70.77	49,832.45
2270002075	Off-Highway Tractors	Diesel	24.67	171.72	153.21	23.51	13.23	9,315.16
2270002078	Dumpers/Tenders	Diesel	0.50	1.59	1.59	0.35	0.16	113.85
2270002081	Other Construction Equipment	Diesel	28.15	269.34	184.99	30.70	21.32	15,010.13
2270009010	Other Underground Mining Equipment	Diesel	0.00	0.00	0.00	0.00	0.00	0.00
Construction and Mining Equipment Totals:			3,469.71	16,069.47	27,691.36	1,783.20	1,445.07	1,046,533.54
INDUSTRIAL EQUIPMENT								
2260003030*	Sweepers/Scrubbers	2 Stroke	2.03	0.01	5.42	0.06	0.00	6.13
2260003040*	Other General Industrial Eq	2 Stroke	0.16	0.00	0.41	0.00	0.00	0.47
2265003010*	Aerial Lifts	4 Stroke	9.82	5.35	404.49	0.08	0.18	851.29
2265003020*	Forklifts	4 Stroke	29.04	23.91	1,191.82	0.23	0.57	2,780.14
2265003030*	Sweepers/Scrubbers	4 Stroke	10.70	3.82	350.76	0.11	0.14	694.60
2265003040*	Other General Industrial Eq	4 Stroke	53.31	2.81	746.38	0.84	0.28	1,341.76
2265003050*	Other Material Handling Eq	4 Stroke	0.77	0.40	31.57	0.01	0.01	65.96
2265003060*	AC/Refrigeration	4 Stroke	0.39	0.05	16.35	0.00	0.01	28.31
2265003070*	Terminal Tractors	4 Stroke	2.96	2.43	121.54	0.02	0.06	282.06
2265010010*	Other Oil Field Equipment	4 Stroke	15.07	1.58	620.34	0.13	0.20	977.99
2267003010*	Aerial Lifts	LPG	1.11	5.48	21.74	0.03	0.01	306.78
2267003020*	Forklifts	LPG	105.28	518.56	2,065.39	2.42	0.56	29,013.10
2267003030*	Sweepers/Scrubbers	LPG	0.77	3.75	15.05	0.02	0.00	209.77
2267003040*	Other General Industrial Equipm	LPG	0.26	1.30	5.17	0.01	0.00	72.59
2267003050*	Other Material Handling Equipment	LPG	0.06	0.27	1.08	0.00	0.00	15.23
2267003070*	Terminal Tractors	LPG	0.53	2.60	10.41	0.01	0.00	145.36
2268003020*	Forklifts	CNG	0.51	42.30	168.85	0.20	0.04	1,765.96
2268003030*	Sweepers/Scrubbers	CNG	0.00	0.00	0.00	0.00	0.00	0.00
2268003040*	Other General Industrial Equipment	CNG	0.00	0.00	0.00	0.00	0.00	0.00

SCC	Equipment Description	Engine Type	Crankcase VOC	Diurnal VOC	Vapor Displacement VOC	Spillage VOC	Total VOC
2270002054	Crushing/Proc. Equipment	Diesel	0.19	0.00	0.00	0.00	9.52
2270002057	Rough Terrain Forklifts	Diesel	1.68	0.00	0.00	0.00	85.92
2270002060	Rubber Tire Loaders	Diesel	4.69	0.00	0.00	0.00	239.42
2270002066	Tractors/Loaders/Backhoes	Diesel	6.75	0.00	0.00	0.00	344.44
2270002069	Crawler Tractor/Dozers	Diesel	6.00	0.00	0.00	0.00	306.11
2270002072	Skid Steer Loaders	Diesel	5.36	0.00	0.00	0.00	273.11
2270002075	Off-Highway Tractors	Diesel	0.49	0.00	0.00	0.00	25.16
2270002078	Dumpers/Tenders	Diesel	0.01	0.00	0.00	0.00	0.51
2270002081	Other Construction Equipment	Diesel	0.56	0.00	0.00	0.00	28.72
2270009010	Other Underground Mining Equipment	Diesel	0.00	0.00	0.00	0.00	0.00
Construction and Mining Equipment Totals:			191.90	19.22	12.78	5.20	3,698.80
INDUSTRIAL EQUIPMENT							
2260003030*	Sweepers/Scrubbers	2 Stroke	0.00	0.00	0.01	0.04	2.08
2260003040*	Other General Industrial Eqp	2 Stroke	0.00	0.00	0.00	0.00	0.16
2265003010*	Aerial Lifts	4 Stroke	3.16	0.70	0.31	0.03	14.02
2265003020*	Forklifts	4 Stroke	9.58	0.80	1.01	0.03	40.47
2265003030*	Sweepers/Scrubbers	4 Stroke	3.09	0.25	0.26	0.10	14.39
2265003040*	Other General Industrial Eqp	4 Stroke	11.51	0.35	0.57	0.77	66.51
2265003050*	Other Material Handling Eqp	4 Stroke	0.25	0.04	0.02	0.00	1.08
2265003060*	AC/Refrigeration	4 Stroke	0.12	0.01	0.01	0.00	0.54
2265003070*	Terminal Tractors	4 Stroke	0.98	0.07	0.10	0.00	4.11
2265010010*	Other Oil Field Equipment	4 Stroke	4.68	0.10	0.36	0.05	20.27
2267003010*	Aerial Lifts	LPG	0.37	0.00	0.00	0.00	1.48
2267003020*	Forklifts	LPG	34.74	0.00	0.00	0.00	140.02
2267003030*	Sweepers/Scrubbers	LPG	0.25	0.00	0.00	0.00	1.02
2267003040*	Other General Industrial Equipment	LPG	0.09	0.00	0.00	0.00	0.35
2267003050*	Other Material Handling Equipment	LPG	0.02	0.00	0.00	0.00	0.07
2267003070*	Terminal Tractors	LPG	0.17	0.00	0.00	0.00	0.70
2268003020*	Forklifts	CNG	0.17	0.00	0.00	0.00	0.67
2268003030*	Sweepers/Scrubbers	CNG	0.00	0.00	0.00	0.00	0.00
2268003040*	Other General Industrial Equipment	CNG	0.00	0.00	0.00	0.00	0.00

SCC	Equipment Description	Engine Type	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM10	Exhaust SOx	Exhaust CO2
2268003060*	ACRefrigeration	CNG	0.00	0.06	0.26	0.00	0.00	2.66
2268003070*	Terminal Tractors	CNG	0.00	0.00	0.00	0.00	0.00	0.00
2268010010*	Other Oil Field Equipment	CNG	0.17	13.54	56.08	0.07	0.01	559.32
2270003010	Aerial Lifts	Diesel	2.24	8.94	7.09	1.52	0.68	481.44
2270003020	Forklifts	Diesel	10.63	79.18	57.39	9.88	8.64	6,082.63
2270003030	Sweepers/Scrubbers	Diesel	5.29	48.59	17.71	4.20	3.99	2,812.24
2270003040	Other General Industrial Eqp	Diesel	5.28	56.35	16.97	4.71	3.94	2,775.85
2270003050	Other Material Handling Eqp	Diesel	0.43	2.33	1.35	0.35	0.14	101.38
2270003060	ACRefrigeration	Diesel	20.52	113.65	71.02	15.28	12.92	9,093.94
2270003070	Terminal Tractors	Diesel	5.69	56.07	31.94	4.93	5.18	3,646.86
2270010010	Other Oil Field Equipment	Diesel	5.90	47.57	24.74	5.15	4.33	3,047.26
Industrial Equipment Totals:			288.89	1,040.91	6,061.30	50.25	41.91	67,161.05

LAWN AND GARDEN EQUIPMENT (COM)

2260004016*	Rotary Tillers < 6 HP	2 Stroke	27.85	0.09	74.17	0.79	0.02	96.95
2260004021*	Chain Saws < 6 HP	2 Stroke	321.05	1.44	978.88	13.82	0.23	1,129.74
2260004026*	Trimmers/Edgers/Brush Cutter	2 Stroke	274.67	0.90	743.93	8.30	0.19	948.82
2260004031*	Leafblowers/Vacuums	2 Stroke	251.35	0.96	712.59	8.79	0.18	912.53
2260004036	Snowblowers	2 Stroke	96.24	0.09	242.32	2.65	0.06	283.76
2260004071*	Commercial Turf Equipment	2 Stroke	0.17	0.00	0.45	0.00	0.00	0.58
2265004011*	Lawn mowers	4 Stroke	201.83	3.93	1,622.37	3.20	0.71	3,478.00
2265004016*	Rotary Tillers < 6 HP	4 Stroke	104.50	1.95	792.37	1.90	0.36	1,746.78
2265004026*	Trimmers/Edgers/Brush Cutter	4 Stroke	2.41	0.11	41.74	0.01	0.02	86.12
2265004031*	Leafblowers/Vacuums	4 Stroke	44.26	9.18	1,756.84	0.28	0.67	3,278.52
2265004036	Snowblowers	4 Stroke	6.32	5.29	258.21	0.05	0.13	616.87
2265004041*	Rear Engine Riding Mowers	4 Stroke	4.48	0.67	209.63	0.03	0.08	381.75
2265004046*	Front Mowers	4 Stroke	5.55	0.70	231.12	0.05	0.09	427.53
2265004051*	Shredders < 6 HP	4 Stroke	12.01	0.22	91.07	0.22	0.04	201.40
2265004056*	Lawn & Garden Tractors	4 Stroke	65.35	8.21	2,867.86	0.44	1.06	5,163.59
2265004066*	Chippers/Stump Grinders	4 Stroke	10.73	3.87	442.04	0.09	0.18	858.25
2265004071*	Commercial Turf Equipment	4 Stroke	268.51	40.12	8,743.95	2.81	3.43	16,679.75
2265004076*	Other Lawn & Garden Eqp.	4 Stroke	19.26	0.69	247.75	0.32	0.10	506.21
2267004066*	Chippers/Stump Grinders	LPG	1.05	5.18	20.67	0.02	0.01	289.53

SCC	Equipment Description	Engine Type	Crankcase VOC	Diurnal VOC	Vapor Displacement VOC	Spillage VOC	Total VOC
2268003060*	AC/Refrigeration	CNG	0.00	0.00	0.00	0.00	0.00
2268003070*	Terminal Tractors	CNG	0.00	0.00	0.00	0.00	0.00
2268010010*	Other Oil Field Equipment	CNG	0.06	0.00	0.00	0.00	0.22
2270003010	Aerial Lifts	Diesel	0.04	0.00	0.00	0.00	2.28
2270003020	Forklifts	Diesel	0.21	0.00	0.00	0.00	10.84
2270003030	Sweepers/Scrubbers	Diesel	0.11	0.00	0.00	0.00	5.40
2270003040	Other General Industrial Eqp	Diesel	0.11	0.00	0.00	0.00	5.38
2270003050	Other Material Handling Eqp	Diesel	0.01	0.00	0.00	0.00	0.44
2270003060	AC/Refrigeration	Diesel	0.41	0.00	0.00	0.00	20.93
2270003070	Terminal Tractors	Diesel	0.11	0.00	0.00	0.00	5.81
2270010010	Other Oil Field Equipment	Diesel	0.12	0.00	0.00	0.00	6.01
Industrial Equipment Totals:			70.35	2.32	2.67	1.03	365.25

LAWN AND GARDEN EQUIPMENT (COM)

2260004016*	Rotary Tillers < 6 HP	2 Stroke	0.00	0.02	0.08	1.20	29.14
2260004021*	Chain Saws < 6 HP	2 Stroke	0.00	0.08	0.90	30.87	352.90
2260004026*	Trimmers/Edgers/Brush Cutter	2 Stroke	0.00	0.29	0.76	17.68	293.40
2260004031*	Leafblowers/Vacuums	2 Stroke	0.00	0.39	0.71	4.75	257.20
2260004036	Snowblowers	2 Stroke	0.00	0.14	0.25	3.81	100.44
2260004071*	Commercial Turf Equipment	2 Stroke	0.00	0.00	0.00	0.00	0.17
2265004011*	Lawn mowers	4 Stroke	8.78	0.43	1.59	18.51	231.14
2265004016*	Rotary Tillers < 6 HP	4 Stroke	4.10	0.10	0.80	12.46	121.96
2265004026*	Trimmers/Edgers/Brush Cutter	4 Stroke	0.17	0.00	0.04	0.84	3.46
2265004031*	Leafblowers/Vacuums	4 Stroke	4.60	0.17	1.31	8.70	59.04
2265004036	Snowblowers	4 Stroke	0.00	0.31	0.24	1.62	8.50
2265004041*	Rear Engine Riding Mowers	4 Stroke	0.31	0.08	0.15	0.29	5.31
2265004046*	Front Mowers	4 Stroke	0.37	0.27	0.17	0.33	6.68
2265004051*	Shredders < 6 HP	4 Stroke	0.47	0.06	0.09	1.39	14.03
2265004056*	Lawn & Garden Tractors	4 Stroke	4.53	0.58	2.05	3.67	76.18
2265004066*	Chippers/Stump Grinders	4 Stroke	3.40	0.27	0.34	0.14	14.89
2265004071*	Commercial Turf Equipment	4 Stroke	19.67	3.47	6.71	6.20	304.57
2265004076*	Other Lawn & Garden Eqp.	4 Stroke	0.83	1.61	0.22	0.32	22.24
2267004066*	Chippers/Stump Grinders	LPG	0.35	0.00	0.00	0.00	1.40

SCC	Equipment Description	Engine Type	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM10	Exhaust SOx	Exhaust CO2
2270004031	Leafblowers/Vacuums	Diesel	0.00	0.00	0.00	0.00	0.00	0.07
2270004036	Snowblowers	Diesel	0.13	0.90	0.55	0.12	0.08	58.00
2270004046	Front Mowers	Diesel	9.39	42.54	28.84	5.66	4.45	3,135.57
2270004056	Lawn & Garden Tractors	Diesel	1.22	5.77	3.68	0.73	0.56	395.02
2270004066	Chippers/Stump Grinders	Diesel	1.89	12.96	7.89	1.71	1.21	854.39
2270004071	Commercial Turf Equipment	Diesel	3.12	21.26	12.00	2.58	2.22	1,566.04
2270004076	Other Lawn & Garden Eqp.	Diesel	0.01	0.08	0.05	0.01	0.01	6.14
	Lawn and Garden Equipment (Com) Totals:		1,733.36	167.12	20,131.00	54.58	16.10	43,101.90
LAWN AND GARDEN EQUIPMENT (RES)								
2260004015*	Rotary Tillers < 6 HP	2 Stroke	6.27	0.02	16.70	0.18	0.00	22.00
2260004020*	Chain Saws < 6 HP	2 Stroke	86.86	0.27	231.37	2.48	0.06	301.93
2260004025*	Trimmers/Edgers/Brush Cutter	2 Stroke	120.61	0.38	321.27	3.44	0.08	419.29
2260004030*	Leafblowers/Vacuums	2 Stroke	77.65	0.24	206.85	2.22	0.05	269.82
2260004035	Snowblowers	2 Stroke	38.07	0.04	95.87	1.05	0.02	112.23
2265004010*	Lawn mowers	4 Stroke	219.07	5.99	2,197.36	1.67	1.08	5,248.16
2265004015*	Rotary Tillers < 6 HP	4 Stroke	17.07	0.53	186.06	0.03	0.09	461.03
2265004025*	Trimmers/Edgers/Brush Cutter	4 Stroke	1.10	0.03	12.48	0.00	0.01	30.16
2265004030*	Leafblowers/Vacuums	4 Stroke	2.18	0.07	23.88	0.00	0.01	58.23
2265004035	Snowblowers	4 Stroke	2.50	2.09	102.19	0.02	0.05	244.08
2265004040*	Rear Engine Riding Mowers	4 Stroke	10.85	1.66	508.70	0.08	0.20	947.04
2265004055*	Lawn & Garden Tractors	4 Stroke	156.25	20.11	6,877.82	1.04	2.61	12,656.09
2265004075*	Other Lawn & Garden Eqp.	4 Stroke	16.97	0.59	217.88	0.29	0.09	444.99
	Lawn and Garden Equipment (Res) Totals:		755.46	32.03	10,998.43	12.49	4.36	21,215.04
LOGGING EQUIPMENT								
2260007005*	Chain Saws > 6 HP	2 Stroke	0.00	0.00	0.00	0.00	0.00	0.00
2265007010*	Shredders > 6 HP	4 Stroke	0.00	0.00	0.00	0.00	0.00	0.00
2265007015*	Forest Eqp - Feller/Bunch/Skidder	4 Stroke	0.00	0.00	0.00	0.00	0.00	0.00
2270007010	Shredders > 6 HP	Diesel	0.00	0.00	0.00	0.00	0.00	0.00
2270007015	Forest Eqp - Feller/Bunch/Skidder	Diesel	0.00	0.00	0.00	0.00	0.00	0.00
	Logging Equipment Totals:		0.00	0.00	0.00	0.00	0.00	0.00

SCC	Equipment Description	Engine Type	Crankcase VOC	Diurnal VOC	Vapor Displacement VOC	Spillage VOC	Total VOC
2270004031	Leafblowers/Vacuums	Diesel	0.00	0.00	0.00	0.00	0.00
2270004036	Snowblowers	Diesel	0.00	0.00	0.00	0.00	0.13
2270004046	Front Mowers	Diesel	0.19	0.00	0.00	0.00	9.57
2270004056	Lawn & Garden Tractors	Diesel	0.02	0.00	0.00	0.00	1.25
2270004066	Chippers/Stump Grinders	Diesel	0.04	0.00	0.00	0.00	1.93
2270004071	Commercial Turf Equipment	Diesel	0.06	0.00	0.00	0.00	3.19
2270004076	Other Lawn & Garden Eqp.	Diesel	0.00	0.00	0.00	0.00	0.02
	Lawn and Garden Equipment (Com) Totals:		47.90	8.27	16.41	112.79	1,918.75
LAWN AND GARDEN EQUIPMENT (RES)							
2260004015*	Rotary Tillers < 6 HP	2 Stroke	0.00	0.11	0.02	0.27	6.67
2260004020*	Chain Saws < 6 HP	2 Stroke	0.00	0.36	0.24	13.29	100.76
2260004025*	Trimmers/Edgers/Brush Cutter	2 Stroke	0.00	2.26	0.33	7.79	130.99
2260004030*	Leafblowers/Vacuums	2 Stroke	0.00	4.01	0.22	1.43	83.32
2260004035	Snowblowers	2 Stroke	0.00	0.93	0.10	1.51	40.61
2265004010*	Lawn mowers	4 Stroke	12.83	9.66	2.29	26.64	270.48
2265004015*	Rotary Tillers < 6 HP	4 Stroke	1.18	0.63	0.20	3.08	22.17
2265004025*	Trimmers/Edgers/Brush Cutter	4 Stroke	0.08	0.03	0.01	0.30	1.53
2265004030*	Leafblowers/Vacuums	4 Stroke	0.15	0.19	0.03	0.17	2.71
2265004035	Snowblowers	4 Stroke	0.00	2.09	0.10	0.64	5.33
2265004040*	Rear Engine Riding Mowers	4 Stroke	0.75	3.13	0.38	0.72	15.82
2265004055*	Lawn & Garden Tractors	4 Stroke	10.83	22.65	5.03	9.00	203.75
2265004075*	Other Lawn & Garden Eqp.	4 Stroke	0.73	1.42	0.19	0.28	19.59
	Lawn and Garden Equipment (Res) Totals:		26.55	47.48	9.12	65.11	903.72
LOGGING EQUIPMENT							
2260007005*	Chain Saws > 6 HP	2 Stroke	0.00	0.00	0.00	0.00	0.00
2265007010*	Shredders > 6 HP	4 Stroke	0.00	0.00	0.00	0.00	0.00
2265007015*	Forest Eqp - Feller/Bunch/Skidder	4 Stroke	0.00	0.00	0.00	0.00	0.00
2270007010	Shredders > 6 HP	Diesel	0.00	0.00	0.00	0.00	0.00
2270007015	Forest Eqp - Feller/Bunch/Skidder	Diesel	0.00	0.00	0.00	0.00	0.00
	Logging Equipment Totals:		0.00	0.00	0.00	0.00	0.00

SCC	Equipment Description	Engine Type	Exhaust VOC	Exhaust NOx	Exhaust CO	Exhaust PM10	Exhaust SOx	Exhaust CO2
PLEASURE CRAFT								
2282005010*	Outboard	2 Stroke	74.30	1.76	159.94	4.24	0.17	807.70
2282005015*	Personal Water Craft	2 Stroke	42.80	0.27	68.88	2.09	0.08	379.68
2282010005*	Inboard/Sterndrive	4 Stroke	3.63	3.15	106.06	0.04	0.12	574.29
2282020005	Inboard/Sterndrive	Diesel	0.11	2.93	0.47	0.08	0.33	231.13
2282020010	Outboards	Diesel	0.01	0.02	0.02	0.00	0.00	1.91
	Pleasure Craft Totals:		120.85	8.13	335.37	6.45	0.69	1,994.69
RAILROAD EQUIPMENT								
2285002015	Railway Maintenance	Diesel	1.68	7.91	7.57	1.40	0.66	465.10
2285004015*	Railway Maintenance	4 Stroke	0.71	0.07	20.49	0.01	0.01	37.97
2285006015*	Railway Maintenance	LPG	0.00	0.02	0.07	0.00	0.00	1.00
	Railroad Equipment Totals:		2.40	8.00	28.13	1.41	0.67	504.07
RECREATIONAL EQUIPMENT								
2260001010	Motorcycles: Off-Road	2 Stroke	220.32	0.52	201.39	0.06	0.15	766.65
2260001020	Snowmobiles	2 Stroke	0.00	0.00	0.00	0.00	0.00	0.00
2260001030	ATVs	2 Stroke	33.40	0.08	30.54	0.01	0.01	47.54
2260001060*	Specialty Vehicles/Carts	2 Stroke	1.71	0.18	62.52	0.01	0.02	120.92
2265001010	Motorcycles: Off-Road	4 Stroke	3.85	0.58	91.71	0.02	0.08	403.00
2265001030	ATVs	4 Stroke	23.18	3.49	551.96	0.25	1.00	4,854.77
2265001050*	Golf Carts	4 Stroke	12.58	1.32	517.84	0.11	0.17	816.39
2265001060*	Specialty Vehicles/Carts	4 Stroke	1.38	0.22	54.44	0.01	0.02	102.89
2267001060*	Specialty Vehicle Carts	LPG	0.02	0.12	0.47	0.00	0.00	6.64
2270001060	Specialty Vehicle Carts	Diesel	0.43	1.21	1.80	0.29	0.12	86.17
	Recreational Equipment Totals:		296.87	7.71	1,512.66	0.77	1.58	7,204.98
Grand Totals:			7,477.46	17,831.47	83,263.48	1,972.29	1,552.18	1,246,095.51

* Under 25 horsepower spark-ignition engines are lumped into either 2- or 4-stroke.

SCC	Equipment Description	Engine Type	Crankcase VOC	Diurnal VOC	Vapor Displacement VOC	Spillage VOC	Total VOC
PLEASURE CRAFT							
2282005010*	Outboard	2 Stroke	0.00	13.12	0.41	0.05	87.88
2282005015*	Personal Water Craft	2 Stroke	0.00	1.02	0.20	0.01	44.04
2282010005*	Inboard/Stern Drive	4 Stroke	0.00	5.10	0.21	0.00	8.94
2282020005	Inboard/Stern Drive	Diesel	0.00	0.00	0.00	0.00	0.12
2282020010	Outboards	Diesel	0.00	19.25	0.81	0.07	140.99
Pleasure Craft Totals:							
							1.71
			0.03	0.00	0.00	0.00	0.96
		Diesel	0.19	0.03	0.01	0.00	0.00
		4 Stroke	0.00	0.00	0.00	0.00	2.67
		LPG	0.22	0.03	0.01	0.00	
RAILROAD EQUIPMENT							
2285002015	Railway Maintenance						223.08
2285004015*	Railway Maintenance						0.00
2285006015*	Railway Maintenance						33.83
Railroad Equipment Totals:							
							2.06
							4.76
							32.80
							17.03
							1.95
							0.03
							0.44
							316.00
RECREATIONAL EQUIPMENT							
2260001010	Motorcycles: Off-Road	2 Stroke	0.00	1.06	0.61	1.10	223.08
2260001020	Snowmobiles	2 Stroke	0.00	0.00	0.00	0.00	0.00
2260001030	ATVs	2 Stroke	0.00	0.25	0.06	0.11	33.83
2260001060*	Specialty Vehicles/Carts	2 Stroke	0.00	0.29	0.05	0.01	2.06
2265001010	Motorcycles: Off-Road	4 Stroke	0.00	0.47	0.16	0.28	4.76
2265001030	ATVs	4 Stroke	0.00	4.37	1.88	3.37	32.80
2265001050*	Golf Carts	4 Stroke	0.42	0.16	0.30	0.07	17.03
2265001060*	Specialty Vehicles/Carts	LPG	0.01	0.10	0.04	0.01	1.95
2267001060*	Specialty Vehicle Carts	Diesel	0.01	0.00	0.00	0.00	0.03
2270001060	Specialty Vehicle Carts		0.01	0.00	0.00	0.00	0.44
Recreational Equipment Totals:							
			4.34	6.71	3.11	4.96	316.00
			517.28	127.83	57.32	215.49	8,395.37
Grand Totals:							

* Under 25 horsepower spark-ignition engines are lumped into either 2- or 4-stroke.

NONROAD Core Model Ver 2.2d, May 2003

RAILROAD LOCOMOTIVES

A. Calculation of Annual Emissions

1. Line Haul Emissions

There were three railroad companies operating in Utah during 1993. In 1996 there were four companies operating Utah. Since that time, the Denver Rio Grande/Western Railroad has merged with Southern Pacific, and all fuel consumption was reported under the name of Southern Pacific.

Each company reported diesel consumption, by county, for the state of Utah. Emission factors were obtained from "Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources," EPA-450/4-81-026d, July 1989, page 204, table 6-1.

$$(\text{diesel consumption gal/yr}) * (\text{EF lb/gal}) / (2000 \text{ lb/ton}) = \text{emissions tons/yr}$$

$$(972,779.66 \text{ gal/yr}) * (0.0626 \text{ lbs/gal}) / (2000 \text{ lb/ton}) = 30.45 \text{ tons/yr}$$

Each of the railroad companies reported fuel consumption by county. Line haul emissions were apportioned to the Salt Lake City CO maintenance area after studying a map showing the geographic layout of railroad lines within all of Salt Lake County. Rail lines parallel Interstate 15 through the county running north and south. Once the locations of these lines were known, UDAQ estimated that 20 percent of the locomotive miles traveled within the county occurred within the Salt Lake City maintenance area. Therefore, 20 percent of the line haul emissions were attributed to the maintenance area.

2. Yard Emissions

The two railroad companies operating in the maintenance area provided information about the number of yard engines that were operating in the area. The number of engines was averaged between days of the week and different shifts to provide an average number of yard engines. Emission factors were obtained from Volume IV, pages 206-207, table 6-2.

$$(\# \text{ engines}) * (\text{EF lb/engine/yr}) / (2000 \text{ lb/ton}) = \text{emissions tons/yr}$$

$$(10 \text{ engines}) * (7375 \text{ lb/engine/yr}) / (2000 \text{ lb/ton}) = 36.88 \text{ tons/yr}$$

There is only one railroad yard located in Salt Lake City.

B. Calculation of Typical CO Winter-day Emissions

Railroad emissions were assumed to be a uniform activity, 365 days/year.

$$(\text{emissions tons/yr}) / (365 \text{ days/yr}) = \text{emissions tons/day}$$

$$(67.33 \text{ tons/yr}) / (365 \text{ days/yr}) = 0.18$$

C. References

1. Southern Pacific Lines, letter dated June 20, 1994
2. Union Pacific Railroad Company, letter dated June 14, 1994
3. Utah Railway Company, letter dated May 19, 1994
4. "Procedures for Emission Inventory Preparation, Volume IV: Mobile Sources," EPA 450/4-81-026d, July 1989

NON ROAD RAILROAD LOCOMOTIVES
1993 Salt Lake City CO Annual and Typical Winter Day Emissions

County	Gallons: Diesel/year			Number of Yard Locomotives		
	Union Pacific Line Haul	Southern Pacific	Total	Union Pacific	Southern Pacific	Total
Salt Lake	2227047	2636851.3	4863898.3	6	4	10

City	% of County RR lines	Gallons Diesel/year	# Yard Locomotives
Salt Lake	20.00%	972779.66	10

Line Haul Emissions

Emission Factor (lb/gal)	CO	0.0626
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City	Total Gallons Diesel	CO tons/yr	CO tons/day
Salt Lake City	972779.66	30.45	0.08

Yard Emissions

Emission Factor (lb/locomotive/year)	CO	7375
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City	Number of Yard Engines	CO tons/yr	CO tons/day
Salt Lake City	10	36.88	0.101

Total Railroad Emissions

City	CO tons/year	CO tons/day
Salt Lake City	67.32	0.18



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 JUN 23 1994
 Air Quality

Southern Pacific Lines

Environmental Operations

1515 Arapahoe Street, P.O. Box 5482, Denver, Colorado 80217

Curtis L. Dominicak
 Manager Environmental Field Operations

(303) 634-2444
 FAX (303) 634-2684

June 20, 1994

Mr. Brock LeBaron
 Utah Department of Environmental Quality
 Division of Air Quality - Technical Analysis Section
 150 North 1950 West
 Salt Lake City, Utah 84114

Re: Diesel Fuel Consumption Data for 1993

Dear Mr. LeBaron:

Pursuant to your letter dated May 10, 1994 and your authority under Utah Code, Title 19, Chapter 2, I have prepared a summary of diesel fuel consumption by locomotives operated by Southern Pacific Lines in Utah during the calendar year 1993. As you requested, the estimate is provided by county. Please note that these estimates are based upon average diesel fuel consumption per thousand gross ton mile and thousand gross ton miles per county.

<u>County</u>	<u>Diesel Fuel Consumption (gals)</u>
Box Elder	3,662,069.9
Carbon	2,955,490.7
Davis	835,647.8
Emery	2,181,550.6
Grand	2,961,651.7
Salt Lake	2,636,851.3
Utah	3,652,904.9
Wasatch	126,934.9
Weber	1,464,142.6
Total	<hr/> 20,477,244.4

Mr. Brock LeBaron

June 20, 1994

Page 2

Please contact me at the above address if you have any questions regarding the provided information.

Sincerely,



Curtis L. Dominick
Manager Environmental Field Operations

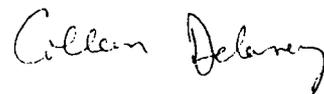
CLD/cld

9/15 /94 - Phone Call from Curtis Dominick

1 yard Locomotive in Ogden

4 yard Locomotives in Salt Lake (weighted average)

Nine in Davis County



ATTACHMENT 2
UNION PACIFIC RAILROAD COMPANY

K. R. (KEN) WELCH
Assistant Vice President
Environmental Management

Mailing Address:
Room 930
1416 Dodge Street
Omaha, Nebraska 68179-0930
Fax No. (402) 271-4461



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JUN 15 1994

June 14, 1994 Air Quality

S. W. (STEVE) BERKI
Director-Environmental Operations-
Central

G. A. (AVERY) GRIMES
Director-Environmental Operations-
Western

L. A. (LANNY) SCHMID
Director-Environmental Operations-
Southern

R. L. (RICK) EADES
Director-Environmental Site Remediation

N. D. (NORM) SILER
Director-Environmental Technologies

File: Air Quality - Utah

Brock LeBaron, Manager
State of Utah
Department of Environmental Quality
Division of Air Quality
Technical Analysis Section
150 North 1950 West
Salt Lake City, UT 84114

Dear Mr. LeBaron:

Per your request of May 10th for a summary of fuel consumption by county in which Union Pacific operates. The attached spread sheet provides this data for 1993.

There figures were derived by determining the total Union Pacific gross ton miles per county and then applying a system fuel consumption factor. Switch engine fuel was estimated to be 228 gallons per yard-job equivalent (the number of switch engines operated 24 hours per day 365 days per year).

If you have any questions regarding this data, please don't hesitate to contact me at (402) 271-6571.

Sincerely,

Christi Hornick
Manager Air Quality

Union Pacific Railroad

County	Segments	Avg. Daily GT/M (mil)	Miles of Track	Avg. Daily GT	Fuel - Road (gallons)	# of Switch Locomotives	Fuel - Switchers (gallons)	Total Fuel Consumption
<i>Beaver</i>	Iron Co. to Millard Co.	40.63	38	1543940000	2,223,274		0	2,223,274
<i>Box Elder</i>	Weber Co. to Cache Co.	66.19	37	2449030000	3,526,603		0	3,526,603
	Little Mountain to Weber Co.	1.53	11	16830000	24,235		0	24,235
	Garland to Idaho border	1.02	19	19380000	27,907		0	27,907
	Bingham City to Garland	1.02	20	20400000	29,376		0	29,376
<i>Cache</i>	Box Elder Co. to Idaho border	12.09	17	205530000	295,963		0	295,963
	Cache Junct. to Franklin Co.	0.15	42	6300000	9,072		0	9,072
<i>Davis</i>	Salt Lake Co. to Weber Co.	66.19	25	1654750000	2,382,840		0	2,382,840
	Morgan Co. to Ogden	58.43	1	58430000	84,139		0	84,139
<i>Iron</i>	Nevada border to Lund	39.40	41	1615400000	2,326,176		0	2,326,176
	Lund to Beaver Co.	40.63	9	365670000	526,565		0	526,565
	Lund to Iron Springs	1.10	20	22000000	31,680		0	31,680
	Iron Springs to Cedar City	0.10	12	12000000	1,728		0	1,728
	Iron Springs to Iron Mountain	0.75	14	10500000	15,120		0	15,120
<i>Juab</i>	Millard Co. to Tooele Co.	29.10	35	1018500000	1,466,640		0	1,466,640
	Millard Co. to Utah Co.	18.97	53	1005410000	1,447,790		0	1,447,790
<i>Millard</i>	Beaver Co. to Lynndyl	40.63	76	3087880000	4,446,547		0	4,446,547
	Lynndyl to Juab Co. towards Smelter	29.10	3	87300000	125,712		0	125,712
	Lynndyl to Juab Co. towards Provo	18.97	9	170730000	245,851		0	245,851
<i>Morgan</i>	Summit Co. to Davis Co.	58.43	21	1227030000	1,766,923		0	1,766,923
<i>Salt Lake</i>	Tooele Co. to Smelter from Lynndyl	29.10	1	29100000	41,904	6	499,320	541,224
	Smelter to Salt Lake City	59.72	16	955520000	1,375,949		0	1,375,949
	Utah Co. to Salt Lake City --Route 1	3.91	8	31280000	45,043		0	45,043
	Utah Co. to Salt Lake City --Route 2	4.41	24	105840000	152,410		0	152,410
	Tooele Co. to Smelter from Delle	27.68	1	27680000	39,859		0	39,859
	Salt Lake City to Davis Co.	66.19	6	397140000	571,882		0	571,882
<i>Summit</i>	Wyoming border to Echo	58.43	31	1811330000	2,608,315		0	2,608,315
<i>Tooele</i>	Juab Co. to Salt Lake Co.	29.10	61	1775100000	2,556,144		0	2,556,144
	Nevada border to Marblehead	27.68	65	1799200000	2,590,848		0	2,590,848
	Marblehead to Delle	27.68	8	221440000	318,874		0	318,874
	Delle to Ellerbeck	27.68	14	387520000	558,029		0	558,029
	Ellerbeck to Salt Lake Co.	27.68	17	470560000	677,606		0	677,606
	Delle to Rowley	0.14	11	1540000	2,218		0	2,218
	Ellerbeck to Dolomite	0.03	3	90000	130		0	130
<i>Utah</i>	Juab Co. to Provo	18.97	22	417340000	600,970	1	83,220	684,190
	Provo to Salt Lake Co.--Route 1	3.91	23	89930000	129,499		0	129,499
	Provo to Salt Lake Co.--Route 2	4.41	24	105840000	152,410		0	152,410
<i>Weber</i>	Ogden to Box Elder Co.	11.15	9	100350000	144,504	3	249,660	394,164
	Box Elder Co. to Little Mtn. Junct.	1.53	11	16830000	24,235		0	24,235
TOTAL----								34,427,170

ATTACHMENT 3

UTAH RAILWAY COMPANY

6095 SOUTH 300 EAST • SUITE 260
SALT LAKE CITY, UTAH 84107-7359
PHONE (801) 263-8887 • FAX (801) 265-8810
P. O. Box 57040
Salt Lake City, Utah 84157-0040

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MAY 20 1994
Air Quality

May 19, 1994

File: 11-E-4

Mr. Brock LeBaron, Manager
Technical Analysis Section
Division of Air Quality
State of Utah
P. O. Box 144820
Salt Lake City, Utah 84114-4820

Re: 1993 Emissions Inventory

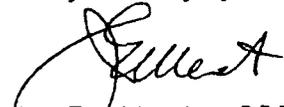
Dear Mr. LeBaron:

In response to your letter of May 10, 1994, Utah Railway Company reports fuel consumption, by county, for the calendar year 1993 as follows:

<u>County</u>	<u>Gallons</u>
Carbon	456,330
Emery	3,990
Utah	858,200
Wasatch	<u>75,159</u>
TOTAL	1,393,679

The above figures are for diesel fuel consumed by locomotives while operating trains in the above listed counties.

Very truly yours,


J. E. West, III
VP Finance &
Traffic Manager

cc: Mr. D. Gilson, President
Mr. R. G. Hall, Controller

Point Sources

This inventory is based on the 1993 calendar year and applies to the Salt Lake City CO maintenance area.

The 1993 CO emissions for any individual point sources within Salt Lake City did not exceed 100 tons/year. Therefore, all stationary sources were considered as part of the area source inventory for Salt Lake City.

Salt Lake City CO SIP Update

September 2003

Technical Support Documentation

Mobile Source 1993 Base Year Inventory Using MOBILE6.2

Modeling the 1993 base year CO inventory involves replicating the assumptions defined in the Salt Lake City CO SIP in terms of the new MOBILE6.2 mobile source emissions model. In most cases this is a straightforward exercise. In other instances past modeling assumptions do not apply to new modeling techniques or new model inputs are not defined in the existing SIP. An example of the former is the assumption that all local class roadways operate at 20 mph, but the new MOBILE6.2 model uses a default speed profile for local class roadways with a mean speed of 12.9 mph. An example of the latter is absolute humidity which was not a required input for MOBILE5 emissions modeling.

The following discussion identifies how MOBILE6.2 input parameters have been defined in terms to replicate the base year mobile source inventory in the existing CO SIP for Salt Lake City. The MOBILE6.2 command file is found in "CO_SIP03.in". MOBILE6.2 parameters not identified below either do not apply or assume the default value.

Absolute Humidity

This parameter is not defined in the SIP since it is not a required input for MOBILE5. Since absolute humidity can be determined based on temperature and relative humidity, some reasonable estimates of absolute humidity can be made for 1993. The file "absolute-humidity.xls" uses the EPA absolute humidity spreadsheet to calculate absolute humidity based on temperatures defined in the SIP, an assumed diurnal temperature profile, and relative humidity and station pressure data for Salt lake City for 1996 from the NOAA.

The result of this analysis of absolute humidity is a minimum hourly value of 16.35 which is below the MOBILE6.2 accepted minimum of 20.0. A check of the 20.0 value with the assumed temperature profile reveals that the corresponding relative humidity values are all below the physical maximum of 100%. Therefore, the value of 20.0 for absolute humidity was used in the MOBILE6.2 model.

It should be noted that absolute humidity will have little if any affect on CO emissions since air conditioning usage is not a factor during winter driving conditions.

Temperature

Minimum and maximum temperatures of 23 and 45 degrees fahrenheit defined in the existing CO SIP were used in the MOBILE6.2 analysis.

Registration Distribution

The MOBILE5 modeling for the existing CO SIP uses local registration data to define the 1993 vehicle age profile. This vehicle age profile was converted to MOBILE6.2 format for this analysis in accordance with MOBILE6.2 guidance for adapting MOBILE5 age profiles by vehicle class to MOBILE6.2 age profiles by vehicle class. The MOBILE6.2 age profile for 1993

is found in the file "SLage93.d".

I/M Program

In 1993 the Salt Lake County I/M program was defined as follows: start year 1984, annual computerized test and repair, basic two speed idle emission test, model years 1968 to 1993, all light duty and heavy duty type vehicles are tested, 22% stringency, 96% compliance, no technician training credits, 1.0% waiver rate, vehicles 25 or more years old are exempt, and a 50% reduction of effectiveness for the decentralized testing program. All of these I/M parameters were defined directly into the I/M descriptive file for MOBILE6.2 found in "SL93_95.txt".

ATP

In 1993 the Salt Lake County ATP program was defined as follows: start year 1984, vehicles 1984 and newer are tested, all light duty and heavy duty vehicle types are tested, emission testing is done annually, compliance rate is 96%, and all inspections except tailpipe lead are performed. All of these ATP parameters were defined directly into the MOBILE6.2 command file.

Fuel Program

Fuel program is a new parameter to MOBILE6.2. Program "3" or "Conventional Gasoline West" was selected for MOBILE6.2 analysis.

RVP

Winter time Reid vapor pressure in 1993 was 12.1 and this value was entered in the MOBILE6.2 command file.

Altitude

High altitude conditions were assumed in the existing SIP emissions analysis and likewise in the MOBILE6.2 analysis.

Diesel Sulfur

Diesel sulfur is an input parameter new to MOBILE6.2. The current value of 330 ppm will be used in the MOBILE6.2 analysis of the 1993 base year.

VMT Profile by Hour

An hourly profile of VMT is not part of the original SIP emission modeling for mobile sources. The original SIP did, however, assume that 18.7% of the daily VMT occurred under congested (or peak-hour) conditions. Using a UDOT 1996 hourly profile of Salt Lake County VMT, the peak volumes for 8-9 AM and 5-6 PM represented roughly 18.7% of the daily VMT. The hourly VMT data from UDOT was modified such that the two peak hours identified above total 18.7% while maintaining their relative proportions from the 1996 data. Likewise the non-peak hours were adjusted to total the remaining 81.3% of the daily VMT in relative proportion to the 1996 data. The resulting hourly profile was used to represent the 1993 hourly VMT profile and is found in "HvSC1993.d".

VMT Profile by Speed

A speed profile of VMT is not part of the original SIP emission modeling for mobile sources.

MOBILE6.2 modeling this parameter was left blank resulting in the use of a default VMT fraction which will be the same for all facility types.

Vehicles Not Subject to I/M Programs

A number of the vehicles operating within the Salt Lake City CO non-attainment area originate from areas that do not have an emissions testing program in place. For example, Summit County on the other side of the mountains just east of Salt Lake does not have an I/M program so any vehicles from Summit County used for commuting or other business in Salt Lake City may not operate as cleanly as an identical vehicle registered in Salt Lake County. In the original SIP this "out of area" effect was ignored because the impact is believed to be small and information was not available on the number of out of area vehicles operating in Salt Lake City.

New vehicle emission technology lends further support to the assumption that the impact of out of area vehicles is small, but new data makes it possible to estimate out of area vehicle emissions and this impact can and should be included in the emissions analysis.

The data source for out of area vehicle travel is 2001 accident records. By noting the county of origin of vehicles involved in crashes in Salt Lake County it is possible to make an estimate of the percentage of VMT accumulated in Salt Lake City by out of area vehicles. Emissions for these vehicles are modeled without an I/M program and the resulting emission rates are applied to the appropriate percentage of VMT, then combined with emission estimates for other vehicles that are subject to emission testing.

The 2001 crash data for Salt Lake County indicates that 4.5% of the vehicles involved in crashes were from counties without emission testing. This value will be assumed equally valid for Salt Lake City as Salt Lake County and will be applied to the year 1993 base year as well as all projection years. For crash data details see the spreadsheet file "County of Residence.xls".

VMT Projections

Base year emissions will use the VMT documented in the existing SIP. The Salt Lake City 1993 VMT values from the SIP for an average annual weekday are: 1,676,230 for freeways and ramps, 2,591,338 for arterials, and 810,439 for local roads. These VMT values are obtained from HPMS data collected by UDOT and adjusted from average annual day to weekdays. A seasonal adjustment for winter traffic levels is applied to the emissions calculation.

The HPMS VMT for freeways and ramps is split into each type based on the proportion of modeled VMT for freeways and ramps. For 1993 the freeway VMT is 1,588,673 and the ramp VMT is 87,557.