

UTAH DIVISION OF AIR QUALITY

PM_{2.5} EMISSION

INVENTORY PREPARATION

PLAN

January 13, 2011

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ACRONYMS AND ABBREVIATIONS

AADT	Average annual daily traffic
AP-42	Compilation of Air Pollutant Emissions Factors
APCA	Air Pollution Control Association
ATP	Anti-tampering Programs
AWKDT	Average weekday traffic
AWKNDT	Average weekend day traffic
BTU	British thermal unit
C	Control device efficiency (in percent) if the EF does not include a level of control
CEM	Continuous Emission Monitor
CFR	Code of Federal Regulations
CH ₄	Methane
CMAQ	Community Multi-scale Air Quality Modeling System
CMPO	Cache Metropolitan Planning Organization
CO	Carbon monoxide
CO ₂	Carbon dioxide
CTG	Control Technique Guidelines
E	Emissions estimate (at process level)
Ed.	Edition
EDMS	Emissions and Dispersion Modeling System
EF	Emission factors
EIIP	Emissions Inventory Improvement Program
EIS	Emission Inventory System
EPA	Environmental Protection Agency
GHG	Greenhouse gas
GIS	Global Information Systems
GOPB	Governor's Office of Planning and Budget
GUI	Graphical User Interface
Hg	Mercury
HPMS	Highway Performance Monitoring System
Hr	Hour
IM	Inspection and Maintenance Program
IPP	Inventory Preparation Plan
kW	Kilowatt
lb	Pound
MACT	Maximum Achievable Control Technology
MAG	Mountainland Association of Governments

Max	Maximum
Min	Minimum
$\mu\text{g}/\text{m}^3$	Micrograms per cubic meter
MOVES	Motor Vehicle Emissions Simulation
MPO	Metropolitan Planning Organization
N_2O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAICS	North American Industry Classification System
NC	North Carolina
Neg	Negligible
NEI	National Emissions Inventory
NESHAP	Emission Standards for Hazardous Air Pollutants
NH_3	Ammonia
NMIM	National Mobile Inventory Model
NOAA	National Oceanic and Atmospheric Administration
NO_x	Oxides of nitrogen
NSPS	New Source Performance Standards
NWS	National Weather Service
O_3	Ozone
OBD	On-board diagnostics
Pb	Lead
PM_{10}	Particulate matter with aerodynamic diameters less than or equal to 10
$\text{PM}_{2.5}$	Particulate matter with aerodynamic diameters less than or equal to 2.5
ppmw	Parts per million by weight
psi	Pounds per square inch
QA	Quality Assurance
QC	Quality Control
R	Activity level
RACM	Reasonably Available Control Measures
RACT	Reasonably Available Control Technology
RE	Rule effectiveness
RP	Rule penetration
RVP	Reid Vapor Pressure
SCCs	Source Classification Codes
SIC	Standard Industrial Classification Code
SIP	State Implementation Plan
SMOKE	Sparse Matrix Operator Kernel Emissions Model
SO_x	Oxides of sulfur
TDMs	Travel demand models
TTC	Technician Training and Certification Credit

UDAQ	Utah Division of Air Quality
UDOT	Utah Department of Transportation
USEPA	United States Environmental Protection Agency
VMT	Vehicle miles traveled
VOC	Volatile organic compounds
Vol.	Volume
WFRC	Wasatch Front Regional Council

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**UTAH DIVISION OF AIR QUALITY AND
IDAHO DEPARTMENT OF ENVIRONMENTAL QUALITY
EMISSIONS INVENTORY PREPARATION PLAN (IPP)**

POLICY STATEMENT

The objective of the air pollution source emissions inventory for the State of Utah and State of Idaho is to compile an accurate and comprehensive database of annual and periodic emissions from point, area, mobile, biogenic, and geogenic sources as required by the Clean Air Act amendments of 1990. The Environmental Protection Agency (EPA) has developed two categories of point sources (Type A and Type B). Table 1 identifies the threshold levels for Type A and Type B point sources. The inventories will be developed annually for Type A point sources, every three years for Type B point sources, and every three years for point, area, mobile, biogenic, and geogenic sources statewide. In general, they will address all areas in the state and specifically all areas that are designated as non-attainment or maintenance areas.

To ensure that an emissions inventory is of acceptable quality for the various levels of inventories, the Utah Division of Air Quality (UDAQ) and Idaho Department of Environmental Quality (IDEQ) will implement an emission inventory quality assurance (QA) program which will implement certain quality control (QC) procedures at various points in the inventory process. Resources, including trained personnel, will be allocated for this purpose. UDAQ and IDEQ, in general, will follow the procedures outlined in the EPA, "Emissions Inventory Improvement Program (EIIP), Office of Air Quality Planning and Standards, MD-14, EPA-454/R-97-004a" guidance document for the preparation of the various levels of emission inventories. For a detailed breakout of the individual inventory levels impacted by this plan, see Table 2. The details of the QA program are discussed in the following sections.

UDAQ Quality Assurance Coordinator

IDEQ Quality Assurance Coordinator

UDAQ Division Director

IDEQ Air Division Administrator

TABLE 1¹
MINIMUM POINT SOURCE REPORTING THRESHOLDS BY POLLUTANT
(Potential to Emit in Tons/year)

Pollutant	Annual cycle (Type A sources)	Three-year cycle Type B Sources
Oxides of Sulfur (SO _x)	≥ 2500	≥ 100
Oxides of Nitrogen (NO _x)	≥ 2500	≥ 100
PM ₁₀	≥ 250	≥ 100
PM _{2.5}	≥ 250	≥ 100
Carbon Monoxide (CO)	≥ 2500	≥ 1000
Volatile Organic Compounds (VOC)	≥ 250	≥ 100
Ammonia (NH ₃)	≥ 250	≥ 100
Lead (Pb)		≥ 5

¹ Table 1 reflects reporting requirements outlined in the Air Emission Reporting Rule (AERR). The inventories used in this PM_{2.5} SIP will be collected using the reporting requirements outlined in 40 CFR Part 51 Subpart A § Parts 51.15 through Part 51.50.

TABLE 2
LEVEL OF DETAIL USED IN THE PM 2.5 INVENTORY

Inventory Category	Description of Inventory	Reason(s) for Classification
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 September 21, 2006, EPA promulgated revisions to the National Ambient Air Quality Standards (NAAQS) for PM_{2.5}. It retained the primary annual standard at 15 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), but lowered the 24-hour standard from the 1997 level of 65 $\mu\text{g}/\text{m}^3$ to 35. Secondary standards were set for each averaging period at the same levels as the respective primary standards. The effective date for these standards was December 18, 2006.

On December 14, 2009, EPA effectively designated Salt Lake, Davis, and portions of Box Elder, Cache, Tooele, Utah and Weber counties in Utah as non-attainment for the federal 24-hr PM_{2.5} standard, and in Idaho a portion of Franklin County that makes up the northern portion of the Logan UT/ID area.

The areas include the following:

1. Cache County west of and including any portion of the following townships located within Utah: Township 15 North Range 1 East; Township 14 North Range 1 East; Township 13 North Range 1 East; Township 12 North Range 1 East; Township 11 North Range 1 East; Township 10 North Range 1 East; and Township 9 North Range 1 East.
2. In Idaho, Franklin County (part) - Begin in the bottom left corner (southwest) of the nonattainment area boundary, southwest corner of the PLSS-Boise Meridian, Township 16 South, Range 37 East, Section 25. The boundary then proceeds north to the northwest corner of Township 15 South, Range 37 East, Section 25; then the boundary proceeds east to the southeast corner of Township 15 South, Range 38 East, Section 19; then north to the Franklin County boundary at the northwest corner of Township 13 South, Range 38 East, Section 20. From this point the boundary proceeds east 3.5 sections along the northern border of the county boundary where it then turns south 2 sections, and then proceeds east 5 more sections, and then north 2 sections more. At this point, the boundary leaves the county boundary and proceeds east at the southeast corner of Township 13 South, Range 39 East, Section 14; then the boundary heads north 2 sections to northwest corner of Township 13 South, Range 39 east, Section 12; then the boundary proceeds east 2 sections to the northeast corner of Township 13 South, Range 40 East, Section 7. The boundary then proceeds south 2 sections to the northwest corner of Township 13 South, Range 40 East, Section 20; the boundary then proceeds east 6 sections to the northeast corner of Township 13 South, Range 41 East, Section 19. The boundary then proceeds south 20 sections to the southeast corner of Township 16 South, Range 41 East, Section 30. Finally, the boundary is completed as it proceeds west 20 sections along the southern Idaho state boundary to the southwest corner of the Township 16 South, Range 37 East, Section 25.
3. Utah County west of the Wasatch Mountain Range including the cities of Provo and Orem with an eastern boundary for Utah County as the following townships: Township 3 South Range 1 East; Township 4 South Range 2 East; Township 5 South Range 3 East; Township 6 South Range 3 East; Township 7 South Range 3 East; Township 8 South Range 3 East; Township 9 South Range 3 East; and Township 10 South Range 2 East.
4. Box Elder County including Brigham City and the following townships: Township 7 North Range 2 West; Township 8 North Range 2 West; Township 9 North Range 2 West; Township 10 North Range 2 West; Township 11 North Range 2 West; Township 12 North Range 2 West; Township 13 North Range 2 West; Township 9 North Range 3 West; Township 10 North Range 3 West; Township 11 North Range 3 West; Township 12 North Range 3 West; Township 13 North Range 3 West; Township 13 North Range 4 West; Township 12 North Range 4 West; Township 11 North Range 4 West; Township 10 North Range 4 West; Township 9 North Range 4 West; Township 13 North Range 5 West;

Township 12 North Range 5 West; Township 11 North Range 5 West; Township 10 North Range 5 West; Township 9 North Range 5 West; Township 13 North Range 6 West; Township 12 North Range 6 West; Township 11 North Range 6 West; Township 10 North Range 6 West; Township 9 North Range 6 West; Township 7 North Range 1 West (portion located in Box Elder County); Township 8 North Range 1 West (portion located in Box Elder County).

5. Davis County.
6. Salt Lake County.
7. Tooele County including Tooele City and the following townships: Township 1 South Range 3 West; Township 2 South Range 3 West; Township 3 South Range 3 West; Township 3 South Range 4 West; Township 2 South Range 4 West; Township 2 South Range 5 West; Township 3 South Range 5 West; Township 3 South Range 6 West; Township 2 South Range 6 West; Township 1 South Range 6 West; Township 1 South Range 5 West; Township 1 South Range 4 West; Township 1 South Range 7 West; Township 2 South Range 7 West; Township 3 South Range 7 West; all sections in Township 4 South Range 7 West except for Sections 29, 30, 31, and 32; Township 4 South Range 6 West; Township 4 South Range 5 West; Township 4 South Range 4 West; and Township 4 South Range 3 West.
8. Weber County that lies west of the Wasatch Mountain Range with an eastern boundary for Weber County to be defined as the following Townships (or portion thereof) extending to the western boundary of Weber County: Township 5 North Range 1 West; Township 6 North Range 1 West; all Sections within Township 7 North Range 1 West located within Weber County except for Sections 1, 2, 3, 4, 11, 12, 13, and 24; Township 7 North Range 2 West (portion located in Weber County).

For this new State Implementation Plan, UDAQ, in consultation with the State of Idaho, EPA Region 8, and EPA Region 10 will perform a photochemical grid modeling analysis using Community Multi-scale Air Quality (CMAQ) modeling system based on a Level II emissions inventory (see Table 2).

The purpose of this plan is to provide procedures in enough detail to compile a reasonably accurate, representative, and complete emissions inventory for the modeling process for all the PM_{2.5} SIPs. Furthermore, it is through this plan that EPA can determine the quality and completeness of the inventory data collected by UDAQ and IDEQ.

B. Scope

The procedures and quality assurance criteria contained in this plan are based on the “Clean Air Fine Particle Implementation Rule” (40 CFR Part 51) updated July 1, 2007, EPA’s “Emission Inventory Improvement Program,” “Emissions Inventory Guidance for Implementation of Ozone and Particulate Matter National Ambient Air Quality Standards (NAAQS) and Regional Haze Regulations” dated August 2005, “Guidance on the Use of

Models and Other Analyses for Demonstrating Attainment of Air Quality Goals for Ozone, PM_{2.5}, and Regional Haze” dated April 2007, and "Guidance for Creating Annual On-Road Mobile Source Emission Inventories for PM_{2.5} Non-attainment Areas for Use in SIPs and Conformity" dated August 2005. These documents help to facilitate the collection of point, area, mobile, biogenic, and geogenic emission inventory data.

All criteria pollutants and ammonia will be included in the modeling process for the PM_{2.5} modeling domain. The amounts will be reported as annual emissions. The state will follow the policy approach for addressing each PM_{2.5} precursor as required in 40 CFR Part 51.1002.

Temporal allocation of the annual point source inventories, to other time scales, will be made while preprocessing the inventories for modeling. These adjustments are based on profiles contained in the SMOKE emissions preprocessor. Reports generated by SMOKE for 24-hr averaging periods will be made available for review.

On-road mobile source emission inventories will be prepared for each episode day based on temperatures, absolute humidity, and Vehicle Miles Traveled (VMT) conversion factors for weekday, weekend day, and average daily to average winter daily traffic.

This inventory preparation plan states the planned methods for completion of data estimation and gathering, quality control and quality assurance, and proper documentation and record keeping. Any updates to regulations and guidelines, roadblocks, or events that prompt methodology changes during the emissions inventory will be annotated in the final report. This Inventory Preparation Plan 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 modeling 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 non-road emissions data collection. Emission inventory data analysis is explained in Section IX. Section X describes the modeling 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 programs implemented by UDAQ and IDEQ. 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

Quality Designations for the 2006 24-Hour Fine Particle (PM_{2.5}) National Ambient Air Quality Standards; Final Rule, November 13, 2009).

The modeling domain includes portions of Idaho and also Wyoming. Portions of Franklin County, Idaho, are included in the Logan UT/ID nonattainment area. Idaho DEQ will provide an inventory for areas in the State of Idaho within the modeling domain, and UDAQ will provide emissions estimates for the portions of the domain in Wyoming (with concurrence from Wyoming.)

Figure 2

PM_{2.5} MODELING DOMAIN

The domain includes areas outside the current non-attainment areas in order to ensure that all pollutants, including short-range transported pollutants, are included in the modeling process. See the PM_{2.5} SIP modeling protocol for information on how the domain was determined.



III. AREAS OF RESPONSIBILITY

For UDAQ, The Technical Analysis Section is assigned to compile the point and area source emission inventories. In Idaho, the Emissions Inventory and Technical Services groups will compile all but mobile source data for Franklin County and the modeling domain. The UDAQ Mobile Source staff will compile the non-road inventory for Utah. For the Logan UT/ID nonattainment area, a joint Mobile Source Team composed of the Bannock County Metropolitan Planning Organizations (MPO), UDAQ, and IDEQ staff will complete the on-road mobile source emissions inventory.

On-road mobile source emissions along the Wasatch Front will be calculated by the three MPOs. The Wasatch Front Regional Council (WFRC) will provide emission estimates for Davis, Salt Lake, Box Elder, and Tooele Counties and the urban areas in Weber County. Mountainland Association of Governments (MAG) will calculate emission estimates for Utah County. Cache Metropolitan Planning Organization (CMPO) will calculate emission estimates for Cache County.

UDAQ and IDEQ will calculate emissions for the remaining nine rural counties in the PM_{2.5} SIP domain and rural areas in Weber County not covered by the WFRC travel demand model.

UDAQ and IDEQ staff will review the MPO mobile source emission inventories.

In Utah, the SIP, Technical Analysis, and Mobile Source Sections are three 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 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 UDAQ 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 on the following page.

In Idaho, the QA Coordinator works directly for the Department Director. The QA Coordinator provides oversight on emissions inventory QA practices and for the QA Plan itself, but does not perform the external QA for each project. The QA EI Team Member completes these QA steps and is excluded from generation of any emissions estimates made. The completed inventory report will be reviewed and signed by the IDEQ Air Division Administrator and the QA Coordinator for completeness and accuracy. IDEQ team members involved in the development of the Idaho portion of the EI are listed on the following page with UDAQ staff.

Figure 3**UDAQ SIP Staff**

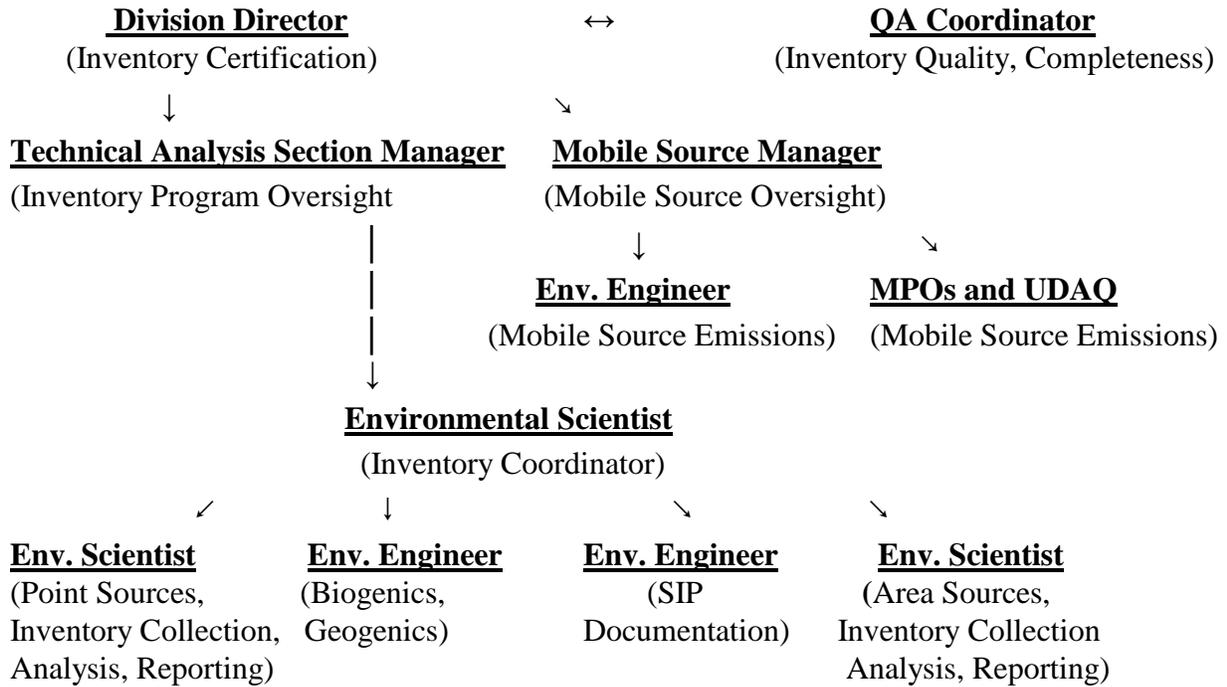
<u>Name</u>	<u>Title</u>	<u>Task</u>	<u>Phone</u>
Bryce Bird Brock LeBaron Joe Thomas	Director UDAQ Manager Manager	Final Approval Technical Analysis Mobile Sources	(801) 536-4000 (801) 536-4006 (801) 536-4175
Kimberly Kreykes	Environmental Scientist	Quality Assurance	(801) 536-4076
Scott Hanks Jim Schubach	Environmental Engineer Environmental Engineer	Point Sources Point Sources	(801) 536-4066 (801) 536-4001
Carol Nielsen	Environmental Scientist	Coordinator/Area Sources	(801) 536-4073
Kip Billings	Transportation Planner	On-road Mobile Sources – WFRC areas	(801) 363-4230 Ext. 115
Susan Hardy Jeff Gilbert	Transportation Planner Transportation Planner	On-road Mobile Sources – MAG areas On-road Mobile Sources – CMPO areas	(801) 229-3842 (435) 755-1634
Richard McKeague Peter Verschoor	Environmental Scientist Environmental Scientist	On-road Mobile Sources – Rural areas On-road Mobile Sources – Rural areas Non-road Mobile Sources-statewide	(801) 536-4025 (801) 536-4186
Ping Xi	Environmental Scientist	On-road Mobile Sources – Rural areas Non-road Mobile Sources-statewide	(801) 546-4071
Patrick Barickman	Environmental Scientist	Bio/Geogenics	(801) 536-4004
Bill Reiss	Environmental Engineer	SIP Documentation	(801) 536-4077

IDEQ SIP Staff

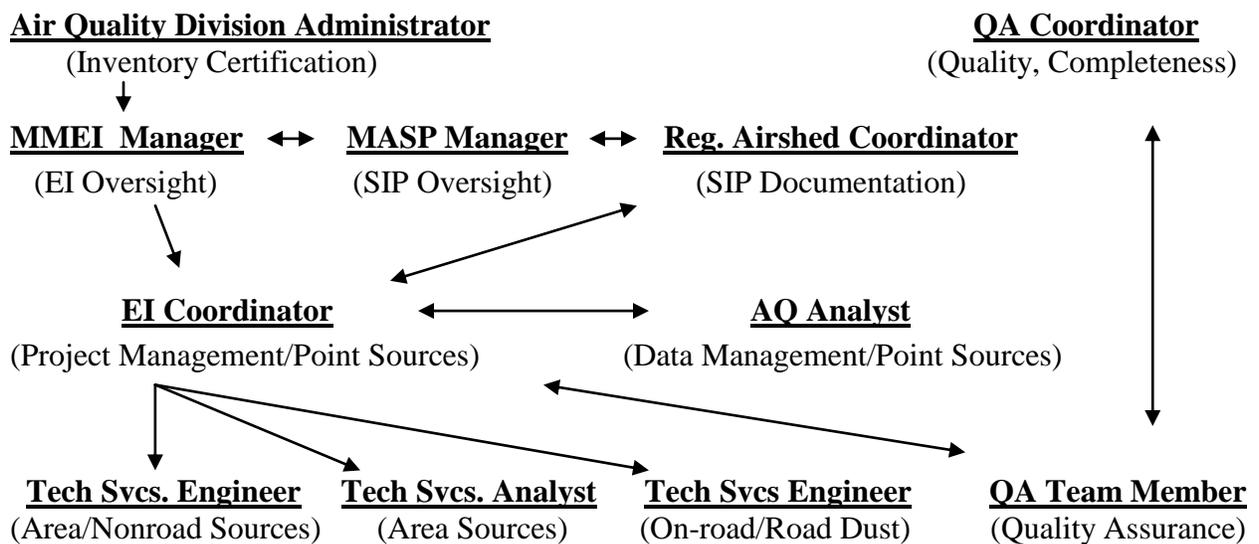
<u>Name</u>	<u>Title</u>	<u>Task</u>	<u>Phone</u>
Martin Bauer Robert Wilkocz Melissa Gibbs Mike Edwards Sue Richards	Air Division Administrator MASP Manager Regional Airshed Coordinator MASP SIP Coordinator Air Quality Analyst	EI Final Approval SIP Oversight Pocatello Region SIP Documentation State Office SIP Oversight SIP Support	(208) 373-0502 (208) 373-0502 (208) 236-6160 (208) 373-0502 (208) 373-0502
Chris Ramsdell	EI Coordinator	Project Management Point Sources	(208) 373-0502
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Darcy Sharp Stephanie Carroll	Tech Services Scientist Tech Services Engineer	Quality Assurance Area Sources Nonroad Sources	(208) 373-0502 (208) 373-0502
Angela Fisher Jennifer Cole	Tech Services Analyst Tech Services Engineer	Area Sources On-road Mobile Sources Road Dust	(208) 373-0502 (208) 373-0502
Sara Strachan	GIS Specialist	GIS support	(208) 373-0502
Don Bledsoe	QA Coordinator	QA support	(208) 373-0502
Rick Hardy Wei Zhang	Tech Services Discipline Lead Tech Services Analyst	Modeling/Biogenic Sources Modeling	(208) 373-0502 (208) 373-0502

Figure 4

UDAQ Areas of Responsibility



IDEQ Areas of Responsibility



IV. EMISSION INVENTORY TRAINING PROGRAM

UDAQ and IDEQ will not compile an official training manual for collecting emission inventories. The “Emissions Inventory Improvement Program (EIIP),” “Handbook for Criteria Pollutant Inventory Development: A Beginners Guide for Point and Area Sources” and “Preparation of Fine Particulate Emission Inventories” APTI Course 419B will be used as reference manuals.

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 SIP base-year inventory, UDAQ and IDEQ will use the definition of a major source used under Title V of the Clean Air Act (as specified in 40 CFR 51.20) to define the thresholds for reporting actual emissions. These thresholds are the potential to emit annual emissions of 100 tons for all relevant criteria air pollutants except CO, for which it is 1000 tons. The 2008 periodic, three-year inventory will be used to make this assessment. Emissions from sources under the above thresholds will be included in the area source base-year inventory.

B. Emission Inventory Source Categories

1. The point source categories inventoried include:
 - a. External combustion sources
 - b. Stationary internal combustion sources
 - c. Hot mix asphalt plants
 - d. Cement manufacturing
 - e. Pharmaceutical manufacturing
 - f. Petroleum and related industries
 - g. Pipeline transport of natural gas
 - h. Construction
 - i. Machinery products

- j. Paper manufacturing
- k. Semiconductor manufacturing
- l. Solid waste disposal
- m. Surface coating
- n. Printing and graphic arts
- o. Organic chemical process industry
- p. Inorganic chemical industry
- q. Food and agricultural industries
- r. Wood processing industries
- s. Mining and quarrying
- t. Chemical manufacturing
- u. Secondary metal processing
- v. Metallurgical industries
- w. Plastic products manufacturing
- x. Miscellaneous sources

- 2. Point source categories whose emissions vary significantly based on ambient air temperature will be identified, including waste treatment facilities and storage tanks. 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. For Utah, a list of point sources will be compiled by querying the existing UDAQ emission inventory database for domain point sources. In Idaho, the point sources in the counties making up the modeling domain will be surveyed directly for 2008 annual emissions.
- 2. Sources of information reviewed routinely to identify additional point sources in the modeling domain include:
 - 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. Departments of Transportation
 - i. State Tax Commissions
 - 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
 - o. Toxic Release Inventory
3. The assembled list will be checked against the source listings to make sure that all existing sources are addressed. In cases where information is incomplete, telephone and/or site visits will be used to verify if the source is still in existence.
 4. Basic information pertaining to each source (e.g., source name, current mailing address, county, contact person, etc.) will be entered into the emission inventory database and updated on an ongoing basis as new information becomes available.

D. 2008 Point Source Emissions Inventory Collection

1. For Utah, all forms, Excel spreadsheets, and corresponding instructions applicable to each point source category are found at the following website: http://www.airquality.utah.gov/Planning/Emission-Inventory/Inventory_Forms.htm. For Idaho, point sources are collected using a Web interface and SQL server database, the Point Source Survey Tool (POSST). All Idaho point source information and emissions data will be stored in POSST upon collection.

2. The UDAQ forms, Excel spreadsheets, and instructions are reviewed annually to make sure they are current, self-explanatory, and detailed enough to provide adequate information. The instructions and questions are designed for people without specialized technical training. The electronic pages of Idaho's POSST are updated annually, as are the user's manual, and help messages, to ensure ease of use.
3. Both UDAQ and IDEQ send a letter 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 letters contain reasons for the inventory, instructions on how to obtain necessary forms, Excel spreadsheets, or how to use POSST, return addresses, the date by which the forms or data must be submitted, and UDAQ and/or IDEQ contacts.

4. The source name and mailing date for each letter sent is recorded by UDAQ or IDEQ.
5. Current addresses for any undeliverable letters are researched and the letters are resent by certified mail.
6. The mailing lists are reviewed to verify that each source returns appropriate forms or makes a data submittal.
7. All sources that do not return the forms or make a data submittal by the specified date are contacted by phone or e-mail to verify their receipt of the project letter. If they did not receive the letter, their mailing address is verified and another letter is sent out certified. At that time, the possibility of penalties is explained and a new deadline of 30 days from the time of the call or e-mail is set.
8. The completeness of information on the returned forms, Excel spreadsheets, or electronic pages in POSST is checked and any additional information is requested either by phone, e-mail, or letter, depending on the importance of the information requested.
9. In Utah, inspectors are sent to sources that appear to provide misleading information on the forms. Site emission points and accuracy of data provided are verified. Calculations and assumptions are reviewed with the contact person at the facility. In Idaho, data in POSST is quality assured and questionable data is discussed directly with facility contacts via telephone or e-mail for correction or verification.

E. Point Source Episode Day Emissions Inventory Data

1. Emissions inventories will be prepared for the episodes to be identified in the modeling protocol.

2. A letter will be sent to point sources requesting date-specific information for the PM_{2.5} SIP episode days. UDAQ will contact sources throughout its portion of the modeling domain, while IDEQ will only consider sources located in the nonattainment area.
3. The 2008 annual inventory will be adjusted to include changes in source operations during the episode days.

F. Point Source Projection Inventory Data

Point sources categorized as Type-B major facilities within the modeling domain will be modeled in the projection years at their permitted maximum emission rates.

VI. AREA SOURCE INVENTORY DATA COLLECTION

A. Area Emission Inventory Source Categories

The following area source categories have been identified in Utah and Idaho and will be inventoried. Stationary sources of emissions not included in the point source inventory will be included in the 2008 area source inventory. Seasonal adjustments will be made to various area source categories to reflect operations during cold pool meteorological conditions.

1. Combustion Sources

- a. Stationary sources using fossil fuel, e.g., wood, natural gas, fuel oil, kerosene, LPG, and coal
 - Residential
 - Commercial and institutional
 - Industrial (excluding point source overlap)
- b. Other combustion sources
 - Forest fires (including wild and prescribed burning)
 - Agricultural burning
 - Open burning (including yard waste, brush, and household waste)
 - Cremation (animal and human)
 - Structural fires

- Vehicle fires
- Charcoal grilling/broiling

2. Evaporative Loss

a. Fuel distribution (gasoline and aviation fuel)

- Fuel truck at bulk terminal
- Fuel trucks in transit
- Underground tank breathing
- Refueling

b. Stationary source solvent and other chemicals

- Dry cleaning
- Solvent cleaning and degreasing
- Household and commercial consumer products
- Graphic arts
- Cutback/Emulsified asphalt paving
- Surface coating
 - Architectural
 - Automobile refinishing
 - Traffic markings
 - Other small industrial
- Pesticides
 - Agricultural
 - Non-agricultural, residential

c. Waste management practices

- Treated and untreated sewage waste
- Municipal and other non-hazardous waste landfill
- Livestock wastes
- Wild animal wastes

- Domestic animal wastes
 - Human respiration, perspiration & cigarettes
 - Industrial point source (ammonia only)
 - Bakery yeast
- d. Fugitive dust sources
- Agricultural land preparation
 - Agricultural harvesting
 - Agricultural unpaved road travel
 - Non-agricultural unpaved road travel
 - Construction site travel, roads and buildings
 - Road dust

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 3.

**TABLE 3
AREA SOURCE EMISSION CALCULATION METHODS**

CATEGORY	METHOD
Agricultural Burning	"Documentation for the Final 2002 Nonpoint Sector (Feb 2006 version) National Emission Inventory for Criteria and Hazardous Air Pollutants," Appendix A-111, Utah State University survey, "Inventory of Agriculture Burning in Utah." Idaho: AP-42 Chapter 2.5, WebFIRE, EPA's SPECIATE 4.2 profile number #8746.
Agricultural Harvesting	Chapter 10, Agricultural Harvesting of the "WRAP Fugitive Dust Handbook," dated September 7, 2006. Idaho: "Preparation of Fine Particulate Emission Inventories Student Workbook," Chapter 7 – WESTAR.

**TABLE 3
AREA SOURCE EMISSION CALCULATION METHODS**

CATEGORY	METHOD
Agricultural Land Preparation	<p>“Agricultural Soil Preparation Fugitive Dust Emissions,” CARB, Patrick Gaffney</p> <p>Idaho: "Preparation of Fine Particulate Emission Inventories Student Workbook," Chapter 7 – WESTAR.</p>
Agricultural, Livestock	<p>“Development And Selection Of Ammonia Emission Factors,” R. Battye et al.</p> <p>Idaho: "Emissions from Animal Feeding Operations" (EPA 2001), "National Emission Inventory - Ammonia Emissions from Animal Husbandry Operations" (EPA 2004), methane from AP-42 Table 14.4-2.</p>
Agricultural, Unpaved Roads	<p>“Reconciling Urban Fugitive Dust Emissions Inventory And Ambient Source Contribution Estimates: Summary of Current Knowledge and Needed Research,” John Watson and Judith Chow</p> <p>Idaho did not calculate emissions for this category, as unpaved roadway dust is not a significant contributor during winter months.</p>
Agricultural, Country Grain Elevators	Idaho: AP-42 Chapter 9.9.1.
Animals, Domestic	<p>“Development of the Ammonia Emission Inventory for the Southern California Air Quality Study,” Radian Corp</p> <p>Idaho did not calculate emissions for this category, as this source is not a significant contributor.</p>
Animals, Wild	<p>“Technical Support Study 15: Evaluation and Improvement of Methods for Determining Ammonia Emissions in the San Joaquin Valley.”</p> <p>Idaho did not calculate emissions for this category, as this source is not a significant contributor.</p>
Asphalt Paving	<p>EIIP, Vol. III, Chapter 17, “Asphalt Paving,” Alternative Method 2</p> <p>Idaho: EIIP, Vol. III, Chapter 17, “Asphalt Paving,” Alternative Method 3. Assumed 98% emulsified and 2% cutback.</p>
Auto Body Refinishing	<p>EIIP, Vol. III, Chapter 13, “Auto Body Refinishing”</p> <p>Idaho: EIIP, Vol. III, Chapter 13, “Auto Body Refinishing,” Alternative Method 1.</p>
Bakery Yeast	EIIP, Vol. III, “Area Source Category Method Abstract – Bakeries”

**TABLE 3
AREA SOURCE EMISSION CALCULATION METHODS**

CATEGORY	METHOD
	Idaho did not calculate emissions for this category, as this source is not a significant contributor.
Biogenic Decay in Soils	BEIS3 software model Idaho did not calculate emissions for this category, as this source is zeroed-out for modeling purposes.
Charcoal Grilling	EIIP, Vol. III, "Area Source Category Method Abstract – Charbroiling" Idaho: "Emissions from Street Vendor Cooking Devices (Charcoal Grilling)" (EPA 1999), VOC species EFs = SPECIATE4.2 - profile #5563 (Biomass Burning - Charcoal Burning).
Combustion, Kerosene	EIIP, "Area Source Category Method Abstract – Fuel Oil and Kerosene Combustion," and supplemented with AP-42, Section 1.3, "Fuel Oil Combustion" Idaho did not calculate emissions for this category, as this source is not a significant contributor.
Combustion, Coal	"Documentation for the Final 2002 Nonpoint Sector (Feb 06 version) National Emission Inventory for Criteria and Hazardous Air Pollutants" Idaho: EIIP Volume III Area Source Category Abstracts, WebFIRE.
Combustion, LPG	"Documentation for the Final 2002 Nonpoint Sector (Feb. 2006 version) National Emission Inventory for Criteria and Hazardous Air Pollutants" Idaho: EIIP Volume III Area Source Category Abstracts, WebFIRE.
Combustion, Natural Gas	"Documentation for the Final 2002 Nonpoint Sector (Feb. 2006 version) National Emission Inventory for Criteria and Hazardous Air Pollutants" Idaho: EIIP Volume III Area Source Category Abstracts, WebFIRE.
Combustion, Oil	"Documentation for the Final 2002 Nonpoint Sector (Feb. 2006 version) National Emission Inventory for Criteria and Hazardous Air Pollutants" Idaho: EIIP Volume III Area Source Category Abstracts, WebFIRE.

**TABLE 3
AREA SOURCE EMISSION CALCULATION METHODS**

CATEGORY	METHOD
Combustion, Wood	EPA Workshop April 2, 2004, "Session VII: Combustion Area Sources - Residential Wood Combustion" and EIIP, Vol. IV, Chapter 2, "Residential Wood Combustion," Preferred Method; with Paria Group survey Idaho: EIIP Volume III Area Source Category Abstracts, WebFIRE, RWC_Inventory Version 7 July 1 2008.mdb.
Construction, Buildings	AP42, Chapter 13.2.3, "Heavy Construction Operations," (1/95 ed.), Chapter 13.2.4, "Aggregate Handling & Storage Piles," (1/95 ed.) and "Documentation for the Final 2002 Nonpoint Sector (Feb. 2006 version) National Emission Inventory for Criteria and Hazardous Air Pollutants." Idaho: "Preparation of Fine Particulate Emission Inventories Student Workbook," Chapter 7 – WESTAR.
Construction, Roads	"Documentation for the Final 2002 Nonpoint Sector (Feb. 2006 version) National Emission Inventory for Criteria and Hazardous Air Pollutants" Idaho: "Preparation of Fine Particulate Emission Inventories Student Workbook," Chapter 7 – WESTAR.
Cremation (animal and human)	Chapter 2.3 of EPA's AP-42. Utah did not calculate emissions for this category, as this source is not a significant contributor.
Dry Cleaning	"Procedures for Emission Inventory Preparation," Vol. III: Area Sources, (9/91 edition), Section 5.3.2, "Dry Cleaning" Idaho: EIIP, Vol. III, Chap 4, Alternate Method 2.
Fires - Forest, Wild, and Prescribed	AP-42, Section 13.1, (10/96 edition), "Wildfires and Prescribed Burning" Idaho. Did not submit Wildfire for 2008 EI. Prescribed burning emissions based on AP-42, Chapter 13.1, "Estimating Ammonia Emissions from Anthropogenic Non-Agricultural Sources" (EPA 2004), SPECIATE 4.2 profile #8743 (Forest Fires – Composite).
Fires, Structural	EIIP, Vol. III, (1/27/99 edition), Chapter 18, "Structure Fires"

**TABLE 3
AREA SOURCE EMISSION CALCULATION METHODS**

CATEGORY	METHOD
Fires, Vehicle	EIIP, Vol. III, (5/15/00 edition), "Area Source Category Method Abstract - Vehicle Fires"
Fuel Distribution	<p>EIIP, Vol. III, Chapter 11, "Gasoline Marketing (Stage I and Stage II);" AP-42, Chapter 5.2, "Transportation and Marketing Of Petroleum Liquids;" and "Procedures For The Preparation Of Emission Inventories For Carbon Dioxide and Precursors Of Ozone"</p> <p>Idaho: EIIP, Vol. III, Chapter 11, "Gasoline Marketing (Stage I and Stage II) Alternate Method 1," VOC EFs from WebFIRE, gasoline sales based on motor vehicle registrations.</p>
Graphic Arts	<p>EIIP, Vol. III, Chapter 7, "Graphic Arts"</p> <p>Idaho: EIIP, Vol. III, Chapter 7, "Graphic Arts," Alternate Method 1, Profile #2570 of EPA's SPECIATE 4.2, "Estimating Ammonia Emissions from Anthropogenic Non-Agricultural Sources" (EPA 2004).</p>
Human Perspiration, Human Respiration, and Cigarette Smoking	<p>"Development of the Ammonia Emission Inventory for the Southern California Air Quality Study," Radian Corp, Appendix G</p> <p>Idaho did not calculate emissions for this category, as this source is not a significant contributor.</p>
Landfills	<p>LANDFILL software model</p> <p>Idaho: LANDGEM, EIIP Vol. III, Chapter 15, Alternative Method 3.</p>
Leaking Underground Storage Tanks	<p>Nominal source, therefore assumed worst probable scenario per Utah Rule R307-6 and DAQ engineer, Tim Blanchard</p> <p>Idaho did not calculate emissions for this category, as this source is not a significant contributor.</p>
Non-agricultural, Unpaved Roads	<p>"Reconciling Urban Fugitive Dust Emissions Inventory and Ambient Source Contribution Estimates: Summary of Current Knowledge and Needed Research," John Watson and Judith Chow, Desert Research Institute</p> <p>Idaho did not calculate emissions for this category, as unpaved roadway dust is not a significant contributor during winter months.</p>
Non-road Aircraft Maintenance	DAQ's 1992 phone survey of aircraft maintenance staff in Salt Lake County

**TABLE 3
AREA SOURCE EMISSION CALCULATION METHODS**

CATEGORY	METHOD
	Idaho did not calculate emissions for this category, as airports are very limited in size and traffic within the modeling domain.
Open Burning	"Emission Inventory Improvement Program (EIIP)," Vol. III, Chapter 16, "Open Burning," (January 2001 ed.), page 16.4-3
Pathological Waste, Human and Animal	Idaho: AP-42 Chapter 2.3.
Pesticide Applications	"Emission Inventory Improvement Program (EIIP)," Vol. III, Chapter 9, "Pesticides - Agricultural and Nonagricultural," (1/31/01 ed.), EIIP Vol. III, Chapter 5, Consumer and Commercial Solvent Use," Idaho: EIIP Vol. III, Chapter 9, USDA's NASS Agricultural Chemical Use Database.
Sand and Gravel	Emissions from nonpoint sand and gravel sources that submit inventory summaries triannually Idaho did not receive emissions reporting from any nonpoint sources for this category.
Sewer Treatment Plants & etc.	"1997 Gridded Ammonia Emission Inventory Update For The South Coast Basin," Charles Botsford et al; and also, Sonoma Tech Inc., Dana Coe, 6/2/00 E-mail Idaho: AP-42 Chapter 4.3, SPECIATE 4.2 using profile number #3003.
Solvent, Cleaning & Degreasing	EIIP, Vol. III, Chapter 6, "Solvent Cleaning," Alternative Method 2
Solvent, Consumer Use	EIIP, Vol. III, Chapter 5, "Consumer And Commercial Solvent Use," Preferred Method
Solvent, Recovery	Idaho: EFs calculated using fugitive air emissions from 2008 and published in Toxic Release Inventory (TRI). Emissions/#Employees per industry = lb/Employee.
Surface Coatings, Architectural	EIIP, Vol. III, Chapter 3, "Architectural Surface Coating" Idaho: EIIP, Vol. III, Chapter 3, Alternative Method, SPECIATE 4.2 profile #3140, EIIP Volume III abstract "Estimating Ammonia Emissions from Anthropogenic Nonagricultural Sources" (EPA 2004).
Surface Coatings, Industrial	EIIP, Vol. III, Chapter 8, "Industrial Surface Coating," Alternative Method 2

TABLE 3
AREA SOURCE EMISSION CALCULATION METHODS

CATEGORY	METHOD
	Idaho: EIIP, Vol. III, Chapter 8.
Surface Coatings, Traffic Markings	EIIP, Vol. III, Chapter 14, "Traffic Markings" Idaho: EIIP, Vol. III, Chapter 14, "Traffic Markings," Alternative Method 1, profile #3135 SPECIATE 4.2.
Tank Cleaning	AP42, Chapter 4.8, "Tank and Drum Cleaning," (2/80 ed.) Idaho did not calculate emissions for this category, as this source is not a significant contributor.

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, whenever possible. Activity level information will be requested from sources such as Departments of Transportation, State Tax Commissions, State Data Centers, State Offices of Planning and Budget, State Energy Commissions, 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. Agricultural activity data from Utah and Idaho state or the federal departments of agriculture; "Utah Agricultural Statistics, Annual Report;" Utah State University Records; "Idaho Agricultural Statistics Report" USDA National Agricultural Statistics Service (NASS)
 - b. Forest fire statistics from the state and US Forest Service or EPA; "National Forest Fire Report"; "Eastern Idaho Interagency Fire Center's 2008 "Annual Report"
 - c. Ambient air data from the National Weather Service records
 - d. Location and size of public schools for Utah and Idaho from the state offices of education
 - e. Consumption of natural gas from Questar Corporation and the US Department of Energy

- f. Coal, propane, kerosene, LPG, distillate, and fuel oil consumption from numerous Department of Energy, Energy Information Administration, and Department of Natural Resources publications
- g. 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 lists maintained by UDAQ and IDEQ.
2. The Internet will be reviewed for needed information. Any documents will be printed, the date indicated, and saved electronically or in hard copy.
3. Contact will be made with the person designated to provide information not available on the Internet.
4. 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 or IDEQ by letter over their signature.
5. All records received will be logged in.
6. All sources of information that have not responded to the information request by the specified date will be called, e-mailed, 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.
7. Completeness and accuracy of information received will be checked and additional information will be requested, if needed.

E. Area Source Emission Apportionment for Partial Counties within the Domain

The PM_{2.5} modeling domain includes only portions of some counties. The air model will be used to apportion the emissions over the partial counties within the domain. Both population, for human-related activities such as fuel combustion, and land area, for activities such as agriculture, will be used for the apportionment of county-level area source emissions in these counties where only a fraction falls within the modeling domain. Excepted from this approach are the three counties in Wyoming. All of the emissions from each of these counties will be included in the modeling. For more information, see Section 2.7.4 of the Modeling Protocol.

The domain includes the following percentage of Utah, Idaho, and Wyoming counties:

Table 4

AREA IN MODELING DOMAIN			
County	Total Sq. Km.	Area in Domain	% in Domain
Bannock (Idaho)	2973	2303	77
Bear Lake (Idaho)	2719	2719	100
Bingham (Idaho)	5485	67	1
Blaine (Idaho)	6871	550	8
Box Elder			100
Cache			100
Carbon	3844	2460.16	64
Caribou (Idaho)	4666	3105	67
Cassia (Idaho)	6669	6208	93
Davis			100
Duchesne	8405	4706.8	56
Emery	11546	2193.74	19
Franklin (Idaho)	1731	1731	100
Jerome (Idaho)	1557	534	34
Juab			100
Lincoln (Idaho)	3120	527	17
Lincoln (Wyoming)			
Minidoka (Idaho)	1982	1199	61
Millard	17708	4604	26
Morgan			100
Oneida (Idaho)	3110	3110	100
Power (Idaho)	3730	3171	85
Rich			100
Salt Lake			100
Sanpete	4147	2654.08	64
Sublette (Wyoming)			
Summit	4867	4331.63	89
Tooele			100
Twin Falls (Idaho)	4995	75	2
Uinta (Wyoming)			
Utah			100
Wasatch			100
Weber			100

The population of the counties inside the modeling domain is as follows:

TABLE 5
POPULATION IN DOMAIN

Apportionment by 2008 Utah Population inside the Modeling Domain and by 2000 Idaho and Wyoming Populations

County	State	County Total Population	County Population inside Domain
Bannock	Idaho	74,377	36,316
Bear Lake	Idaho	5,714	5,714
Bingham	Idaho	39,710	206
Blaine	Idaho	17,501	26
Box Elder	Utah	48,712	48,712
Cache	Utah	111,841	111,841
Carbon	Utah	19,841	17,431
Caribou	Idaho	6328	6,294
Cassia	Idaho	19,459	19,127
Davis	Utah	301,915	301,915
Duchesne	Utah	16,765	7,106
Emery	Utah	10,610	6,187
Franklin	Idaho	10,424	10,424
Jerome	Idaho	17,491	1,643
Juab	Utah	10,039	10,039
Lincoln	Idaho	3,490	84
Lincoln	Wyoming	14,053	10,399
Minidoka	Idaho	19,982	19,982
Millard	Utah	13,550	6,355
Morgan	Utah	9,645	9,645
Oneida	Idaho	3,499	3,499
Power	Idaho	6,652	6,168
Rich	Utah	2,278	2,278
Salt Lake	Utah	1,030,519	1,030,519
Sanpete	Utah	26,960	21,645
Sublette	Wyoming	5,887	1,472
Summit	Utah	39,951	37,063
Tooele	Utah	58,214	58,214
Twin Falls	Idaho	62,625	294
Uinta	Wyoming	20,304	18,274
Uintah	Utah	30,446	30,446
Utah	Utah	519,632	519,632
Wasatch	Utah	22,845	22,845
Weber	Utah	224,536	224,536

F. Area Source Projection Inventory Data

The growth factors that will be used for the area source projections are contained in Table 6.

**TABLE 6
GROWTH FACTORS FOR PROJECTING EMISSIONS OF AREA SOURCE CATEGORIES**

Source Category	Growth Factors	Information Sources
Agricultural Burning, Land Preparation, Harvesting, Livestock, Pesticide Applications (Agricultural), Travel on Unpaved Farm Roads	Agricultural employment growth rate and long-term agricultural averages	Governor's Office of Planning & Budget website; Idaho State Department of Agriculture (ISDA); National Agricultural Statistics Service (NASS); and local agriculture extension offices
Structure and Vehicle Fires, Graphic Arts, Human Respiration and etc., Landfills, Sewer Treatment and etc., Solvent Cleaning and Degreasing, Architectural and Industrial Surface Coatings, Domestic Animals, Auto Body Refinishing, Bakery Yeast, Charcoal Grilling, Kerosene Combustion, LPG combustion, Natural Gas Combustion, Oil Combustion, Pesticide Applications (consumer), Wood Combustion, Building Construction, Dry Cleaning, Open Burning	Human population growth rate; Forecast based on all resources available to the states primary growth planning agency	Governor's Office of Planning & Budget website; and US Census Bureau data
Fuel Distribution	Growth in VMTs for gasoline and forecast of historic trends for aviation fuel	Utah State Tax Commission website; US Department of Energy; and ITD
Traffic Markings, Asphalt Paving, Road Construction	Construction employment growth rate applied to lane miles	Utah Governor's Office of Planning & Budget website; US Department of Energy asphalt data; and local Idaho Highway Districts
Wild Animals	Forecast of historic trends combined with Department of Natural Resources goals and state-level data allocated to counties based on surrogates	Utah Department of Natural Resources, Division of Wildlife Resources website; and the Carnegie Mellon University NH3 model (Strader, et al., 2004)

**TABLE 6
GROWTH FACTORS FOR PROJECTING EMISSIONS OF AREA SOURCE CATEGORIES**

Source Category	Growth Factors	Information Sources
Coal Combustion	Forecast of historic consumption trends of coal	Utah Department of Energy, “Utah Energy Abstract,” Annual Reports from their website; and the Annual Energy Outlook (AEO) published by the Energy Information Administration (EIA) (EIA, 2010)
Biogenic Decay in Soils	No growth; Fixed to total land area and current natural distribution of foliage	Land area mapping, Global Information Systems (GIS)
Leaking Underground Storage Tanks	Growth rate from previous year	Utah Department of Environmental Quality, Division of Response and Remediation website
Forest and Range Fires	Forecast of average acres burned during previous years	Utah Department of Natural Resources, Division of Forestry, Fire & State Lands; US Forest Service; Western Regional Air Partnership (WRAP); and National Interagency Fire Center
Travel on Non-Agricultural, Unpaved Roads	Estimate of change in VMT due to change in area without paved access	Utah Department of Transportation and review of current “Utah Official Highway Map” - Not included in Idaho EI
Aircraft engine maintenance	Estimates of aircraft emissions from the Emissions and Dispersion Modeling System (EDMS) 5.1.2, November 2009, used in conjunction with the UDAQ aircraft maintenance survey information	EDMS run by UDAQ Mobile Section - Not included in Idaho EI
Sand and Gravel	Mining employment growth rates	Utah Governor’s Office of Planning & Budget website - Not included in Idaho EI
Building Construction	Forecast of historic trend of new dwelling units or “housing starts”	Bureau Of Economic and Business Research website; and US Census Bureau’s County Business Patterns

VII. ON-ROAD MOBILE INVENTORY DATA COLLECTION

The Motor Vehicle Emissions Simulator (MOVES2010a) is the EPA designated model for on-road mobile emission inventory for the PM_{2.5} SIP. The on-road mobile inventory will be compiled utilizing MOVES according to the Technical Guidance on the Use of MOVES2010 for Emission Inventory Preparation in State Implementation Plans and Transportation Conformity (April 2010).

A. **Utah Methodology**

The on-road mobile inventory will be compiled through the Interagency Consultation Team following consultation procedures detailed in Section XII of the Utah Transportation Conformity Consultation SIP. The interagency consultation team is primarily used to discuss and decide what MOVES modeling inputs should be utilized with the SIP modeling domain. The interagency consultation team includes representatives from EPA, FHWA\FTA, UDOT, UTA, WFRC, MAG, CMPO, and UDAQ.

Necessary inputs for the MOVES model are assembled into a database called the County Data Manager. Inventories for the SIP will be compiled representing both base and future year scenarios. In some cases the MOVES input data collected will differ depending on where the inventory is being collected. The SIP modeling domain contains both urban and rural counties. Data supplied for these areas may differ depending on the area type.

The state of Utah will adjust the MOVES model core database to be scaled to allow for daily vehicle miles traveled and separate local road facilities. The EPA Office of Transportation and Air Quality has approved this scale modification of the core MOVES database for SIP and Transportation Conformity purposes. MOVES data output will be expressed in units of tons per day by Standard Classification Code. Finer resolution for the purposes of air quality modeling will convert the daily emissions to hourly utilizing the MOVES default hourly VMT profile.

Meteorology – Base year inventories will include hourly temperature and relative humidity data by county for each episode day from a representative weather station in each county. Future year inventories will be based on meteorology from the base-year episode that is selected for the modeled attainment demonstration.

Ramp Fractions – Base and future year ramp fractions for rural freeways will be set to 1% for all rural counties. The MPO's urbanized freeways ramp fraction for base and future years will be determined for each specific urbanized county by their federally approved Travel Demand Model (TDM).

Road Type Distribution, VMT, and Average Speed Distribution – The MOVES model has been modified to allow local roads to be modeled separately for both urbanized and rural counties.

For urbanized areas the MPO's base year and future year calculations for road type distribution, VMT, and average speed distribution will be based on TDM data adjusted to Highway Performance Modeling System data (HPMS).

For rural areas the base year calculations for road type distribution and VMT for the rural counties will use HPMS AADT VMT (average annual daily traffic). Future year calculations for road type distribution and VMT for the rural counties will be based on future population growth trends. Rural county average speed distributions will be computed using the FHWA “Easy Mobile Inventory Tool”, or “EMIT” model.

Both urban and rural areas will utilize VMT factors provided by UDOT to adjust for calendar year, month and day of week.

Inspection and Maintenance (I/M) Programs – For the urbanized areas there are four separate I/M programs currently operating in Utah: Davis, Salt Lake, Utah and Weber. UDAQ consulted extensively with the I/M managers to discuss the exact details of test procedures. The I/M managers then provided written documentation of test procedures, applicable vehicle types and model years.

Age Distribution and Source Type Population – The Utah Tax Commission Division of Motor Vehicles will provide base year inventory data for age distribution and source type population by county for the following vehicle types: motorcycle, light-duty passenger car and light truck. Future year data will be derived from MOVES default growth rates for all vehicle types. Base and future year data for heavy-duty vehicles will be obtained from the MOVES default database.

Fuel Supply and Formulation – MOVES default data base contains incorrect default fuel data for Utah regarding ethanol blends. The MOVES fuel data base has been corrected to reflect the fact that E-10 was not distributed within Utah prior to April 2010. Future year data will be derived from the MOVES default fuel supply and formulations.

B. Idaho Methodology

The on-road mobile inventory for Idaho counties in the modeling domain will be compiled by the Idaho Department of Environmental Quality (IDEQ) with input from ITD, BPO, CMPO, EPA, FHWA and UDAQ and will be reviewed through an Interagency Consultation process.

The state of Idaho will be using the standard unmodified MOVES model core database with four roadway classifications. Inventories for the SIP will be compiled representing both base and future year scenarios for 11 Idaho counties within the SIP modeling domain. The methodology for base year scenario is shown below. For future year scenario, Idaho will review UDAQ growth factors for rural counties and intends to remain consistent with UDAQ unless Idaho population or industrial projections suggest that there may be a significant difference in Idaho counties.

Meteorology – Base year inventories will be modeled using hourly temperature and relative humidity data by county for each episode day from a representative weather station for each county. In the event that a representative station provides an incomplete data set, data sets from 1 to 3 other nearby stations will be used to gap-fill the original data set. After gap-filling the originally selected data set, if there are still isolated missing observations not more than 3 hours long, linear interpolation will be used to estimate data values for temperature and relative humidity.

Ramp Fractions – Base and future year ramp fractions for rural freeways will be set to 1% for 11 Idaho counties in the SIP modeling domain to remain consistency with UDAQ. The MOBILE6 8% default ramp fraction will be used for the small portion of urban interstate in Bannock County (Pocatello).

Road Type Distribution, Vehicle Type VMT and Average Speed Distribution – Road type distribution, vehicle type VMT and average speed distribution will use ITD link-based AADT and VMT and ATR-based length classification data adjusted to match HPMS VMT totals for each road type. Average speed distribution will also be based on ITD link-based AADT and VMT, ATR-based length classification data

and the updated BPR method for average speed estimates as recommended by EPA for rural areas where travel demand models are unavailable (Guidance for the Development of Facility Type VMT and Speed Distributions, USEPA, 1999, EPA 420-P-99-004).

Inspection and Maintenance (I/M) Programs – None of the Idaho counties included in the modeling domain have current or planned Inspection and Maintenance Programs.

Age Distribution – Age distribution inputs for passenger vehicles will be developed using existing MOBILE6.2 age distributions developed for each county by Sierra Research in 2005, however the distribution will be updated using Idaho DMV passenger vehicle registration data to adjust the more detailed Sierra Research distributions to properly reflect the 2007, 2008 and 2009 model years. MOVES national defaults will be used for heavy duty and motorcycle age distributions. An EPA MOBILE6.2 converter program will be used to convert the MOBILE6.2 age distribution into MOVES format.

Source Type Population – ITD will provide light duty vehicle registration data for each county in the modeling domain which will be used to determine the light duty source type populations. Heavy duty vehicle populations will be estimated using the MOVES national default populations by county.

Fuel Supply and Formulation – 11 Idaho counties will be modeled using fuel supply and fuel formulation inputs identical to those used by CMPO for Cache County in Utah.

C. Re-entrained Road Dust

PM10 and PM2.5 Fugitive Dust from Paved Roads – PM fugitive dust from paved roads (re-entrained road dust) is computed by EPA AP-42 (2006), Chapter 13.2.1, “Paved Roads”.

D. Agency Responsibilities

The following table indicates what agencies are responsible for providing data sources for inputs for the MOVES model. The following agencies are responsible for MOVES modeling in different regions of the modeling domain.

Utah County(-ies) with TDM Models	MPO
Cache	Cache MPO
Davis, Salt Lake and Weber	Wasatch Front Regional Council
Utah (County)	Mountainland Association of Governments

The remaining twelve Utah counties and all Idaho counties in the PM_{2.5} modeling domain are not covered by a TDM. For these counties, average speed distributions will be obtained as follows:

Utah Counties without a TDM Model	Responsible Agency
Box Elder, Tooele	Wasatch Front Regional Council

Carbon, Duchesne, Emery, Juab, UDAQ
 Millard, Morgan, Rich, Sanpete,
 Summit, Wasatch

Idaho Counties without a TDM Model Responsible Agency
 Franklin, Bear Lake, Caribou, Oneida, IDEQ
 Bannock, Power, Cassia, Minidoka,
 Jerome, Lincoln, Blaine
 (Twin Falls and Bingham Co. with
 insignificant portions of rural area in the
 domain, will be excluded from MOVES
 modeling).

**TABLE 7
 DATA SOURCES**

MOVES Input Parameter	Utah Data Source	Idaho Data Source
Meteorology	UDAQ	IDEQ
Ramp Fractions	MPO, UDOT	UDAQ estimate ¹
Road Type Distribution	MPO, UDOT	ITD, FHWA
Vehicle Type VMT	MPO, UDOT	ITD, FHWA
I/M Programs	Davis, Salt Lake, Utah, and Weber County Health Departments; Currently no I/M program in Cache county or other counties.	Not applicable in any Idaho counties within the modeling domain
Age Distribution/Source Type Population	Utah DMV	Idaho DMV, Sierra Research (2005)
Average Speed Distribution	MPO, UDOT, FHWA	ITD
Fuel Supply/Fuel Formulation	Utah Dept. of Agriculture, Utah Petroleum Association.	UDAQ ¹ , CMPO

1 Utah DAQ and CMPO are specified as potential sources of input for the Idaho side of Cache Valley since they obtain fuel from the same distributors and ramp fractions should be similar throughout this region

E. IPP Acronym Definitions:

- CMPO - Cache Metropolitan Planning Organization
- DMV - Department of Motor Vehicles
- FHWA - Federal Highway Administration
- FTA - Federal Transit Administration
- ITD - Idaho Transportation Department
- MAG - Mountainland Association of Government
- MPO - Metropolitan Planning Organization

- UDAQ - Utah Division of Air Quality
- UDOT - Utah Department of Transportation
- UTA - Utah Transit Authority
- FHWA - Federal Highway Administration
- FTA - Federal Transit Administration
- WFRC - Wasatch Front Regional Council
- IDEQ – Idaho Department of Environmental Quality

VIII. NON-ROAD MOBILE INVENTORY DATA COLLECTION

NOTE: EPA requires that the 2008 National Emission Inventory (NEI) and the Emission Inventory System (EIS) inventory place aircraft emissions under the Point Source inventory and in the Nonroad Source category, EPA requires locomotive emissions be placed in the Area Source data. The Mobile Sources and Transportation Section will compute these emissions and report them to Point Source inventory staff. Aircraft emissions at point sources should use the release point type code "fugitive". See Sections 6, 7, and 12 of the 2008 NEI/EIS Implementation Plan (<http://www.epa.gov/ttn/chief/net/neip/index.html>) for details.

A. Non-road Mobile Source Categories

The following non-road mobile source categories, as well as those categories in EPA's NONROAD model, will be included in the emission inventory:

1. Aircraft
2. Railroad locomotives
3. Non-road vehicles and equipment
 - Agricultural
 - Airport
 - Commercial
 - Construction and mining
 - Industrial
 - Lawn and garden
 - Marine
 - Logging
 - Pleasure craft
 - Recreational

The NONROAD2008a model (July 2009) will be run using EPA defaults for each county in the domain. This model includes numerous source categories not listed above. In-depth nonroad source surveys are not planned. If, as the inventory is compiled, it appears that a given nonroad source is significant, additional research may be warranted to refine activity data for the emissions inventory.

B. Sources of Non-road Emission Inventory Data

The following list includes some of the activity-level information sources identified for estimation of the nonroad mobile source categories:

1. State Office of Planning and Budget
2. State UDOT Division of Aeronautics
3. Federal agencies (Bureau of Transportation Statistics, Federal Aviation Administration)
4. County and local government agencies
5. Airports
6. Railroad companies
7. EPA NONROAD2008a model

C. Collection of Non-road Emission Inventory Data

1. The appropriate source of information will be contacted for each non-road source category by consulting the information lists maintained by UDAQ and IDEQ.
2. Contact will be made with the persons 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. For UDAQ, the person submitting the records will be asked to transmit them to UDAQ by letter over their signature. IDEQ will accept telephone and e-mail provided data for this source type and will retain documentation as necessary.
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 contacted 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 the following, as well as the information provided by the NONROAD2008a model run for the sources contained therein:
 - Number and types of airports in the modeling domain such as: 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
 - Air ground equipment
 - Number of railroads operating in the domain
 - Rail trip length through the individual counties
 - Type of locomotive
 - Railroad locomotive maintenance equipment
 - Locomotive fuel consumption

D. Methods of Calculation

The methods of calculating the non-road mobile source categories have been identified and are listed in Table 8.

**TABLE 8
NON-ROAD EMISSION CALCULATION METHODS**

CATEGORY	METHOD
*Nonroad, Aircraft Engines	<p>UDAQ - Emissions and Dispersion Modeling System (EDMS 5.1.2, November 2009) software model; EPA guidance for aircraft emissions inventories: "Documentation for Aircraft, Commercial Marine Vessel, Locomotive, and Other Nonroad Components of the National Emissions Inventory," vol. I, Methodology, EPA Contract No 68-D-02-063, Work Assignment No 3-01, September 2005.</p> <p>IDEQ – Will accept EPA estimates for military, commercial, and civilian aircraft for the 2008 NEI. IDEQ will generate in-house data using the Department of Transportation’s Federal Aviation Administration Airport Data (Form 5010), airport schedules where known, and turbo-prop time-in-mode data from Table 5-1 of EPA’s “Procedures for Emissions Inventory Preparation, Volume IV: Mobile Sources.” Aviation gas consumption in Idaho will be gathered from the Energy Information Administration for ammonia</p>

CATEGORY	METHOD
	estimates.
*Nonroad, Aircraft Maintenance	UDAQ - EDMS 5.1.2 software model indirectly IDEQ – Will be gathered in the Area Sources under paint and solvent use, as no airports in the domain warrants the running of EDMS.
*Nonroad, Railroad Engines	UDAQ - Procedures for Emission Inventory Preparation, Vol. IV: “Mobile Sources;” “Documentation for Aircraft, Commercial Marine Vessel, Locomotive, and Other Non-road Components of the National Emissions Inventory,” vol. I, Methodology, EPA Contract No 68-D-02-063, Work Assignment No 3-01, September 2005. IDEQ – Procedures for Emissions Inventory Preparation, Vol. IV: “Mobile Source” and updated emissions factors will be gathered from EPA’s Office of Transportation and Air Quality April 2009 Technical Highlight titled “Emissions Factors for Locomotives” and from “Revised Inventory Guidance for Locomotive Emissions” prepared for Southeastern States Air Resource managers, prepared in June 2004 by Sierra Research.
Other Non-road Mobile Sources	UDAQ and IDEQ - Run the EPA NONROAD2008a model and make appropriate adjustments to the output (for month of year modeled).

*Category not included in EIIP.

E. Non-road Emission Apportionment for Partial Counties within the Domain

1. Airport activity

For UDAQ, the method to apportion airport activity in counties in the domain will be determined by the Technical Analysis Section using the location of each airport. The activity and emissions from each incoming and outgoing airplane will be assigned to the GIS grid square(s) that contain(s) the airport. All aircraft maintenance emissions will be presumed to occur on or very near the airport property so these emissions are effectively located at the airport itself. The IDEQ Technical Services Division will do the same as UDAQ within the domain.

2. Railroad activity

Locomotive diesel fuel consumption is reported to UDAQ from railroad companies and must show fuel consumption by county. Emissions will be calculated by UDAQ using EPA guidance. Emissions will be apportioned throughout the domain by the Technical Analysis Section. The IDEQ Technical Services Division will do the same using fuel consumption data gathered.

3. Other non-road mobile sources

Apportionment of other non-road mobile sources within partial counties will be determined by the Technical Analysis Section using population data (see Section

VI.F of this document). The IDEQ Technical Services Division will use the same method as UDAQ.

F. Non-road Mobile Source Projection Inventory Data

Table 9 indicates the growth factors and other changes that will be included in the non-road mobile source projection inventories.

TABLE 9 GROWTH INDICATORS FOR PROJECTING EMISSIONS OF NON-ROAD SOURCE CATEGORIES		
Source Category	Growth Indicators	Information Sources
Railroad	Activity growth forecasted on the basis of fuel consumption between 1999 and 2008 and fleet turnover forecasts based on EPA documentation	Union Pacific nationwide fuel consumption data
Aircraft flights	Estimates of aircraft emissions from the Emissions and Dispersion Modeling System (EDMS) 5.1.2, November 2009; and the Federal Aviation Administration (FAA)	EDMS run by UDAQ Mobile Section; and FAA Terminal Area Forecast (TAF) (FAA, 2008)
Miscellaneous Nonroad Engines	Directly from EPA's NONROAD 2008s (July 2009) model; Every year run separately, 1995-2050	2008 NONROAD model

IX. EMISSION INVENTORY DATA ANALYSIS

A. Emissions Data Quality

As Table 2 indicates, the 2008 emissions inventory must be 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/IDEQ 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 or contacted directly for data verification. For an industrial area source category, if the difference is large and no records of substantial change in growth exist, the area source will be revisited 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 associated with combustion of fuels 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 area source natural gas use total. The difference is the area source contribution and the contribution of missed or unidentified point sources.

B. Emissions Inventory Data Validation

Excel spreadsheets are used to do emission calculations for many of the inventoried sources. These calculations were checked for reasonableness and accuracy when the spreadsheet was developed for various sources. The calculations are locked to provide assurance that the calculations will not be changed. This provides an automatic QC for each source.

The following steps will be done to validate the inventory data for sources not submitting verified Excel spreadsheets:

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
 - h. Accuracy of Source Classification Codes

- i. Use of proper EPA pollutant codes
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 errors)
4. 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 4 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 staff members designated to recalculate and enter emission estimates into the emissions inventory database.

C. Evaluation of the Uncertainty of Emission Estimates

UDAQ and IDEQ will use the Data Quality Ranking System or some elements of it as suggested in Volume VI of the EIIP 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, UDAQ and IDEQ are committed to adjusting 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 during the emissions inventory development. The relative accuracy of the emissions data will be prioritized by assigning the highest accuracy to data collected with CEMs 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 CEMs 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. Manufacturer's Specifications
- b. EIIP
- c. NSPS
- d. EPA Control Technique Guidelines
- e. EPA Factor Information Retrieval (FIRE) Software
- f. Source assessments and other EPA studies aimed at relating process parameters to emissions of specific industrial processes
- g. 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 a process, 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 = uncontrolled 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. Control Device Efficiency

1. Control device efficiency may be determined by source testing, or provided by the facility in direct surveying.

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 EIIP).

- 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.
- c. 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.

F. Rule Effectiveness and Rule Penetration

Rule effectiveness (RE) and rule penetration (RP) will not be applied to the point source inventories because the source controls are based on permits, not general rules. For Reasonably Available Control Technology (RACT) and Reasonably Available Control Measures (RACM) that affect area and mobile sources, RE and RP will be applied. The percentages used in calculating RE and RP will be determined in consultation with EPA Region 8 and Region 10.

X. SIP DEMONSTRATION MODELING

UDAQ will perform a photochemical grid modeling analysis using CMAQ modeling system for the purpose of the PM_{2.5} attainment demonstration. This will involve the entire domain, including portions of Utah, Idaho, and Wyoming. See page 8 for a map of the domain area.

A. Temporal and Spatial Allocation and Speciation of the Annual Inventory

The software model, SMOKE modeling system, will be used for the following functions:

1. Import the inventory
2. Spatially allocate emissions to a photochemical or aerosol modeling grid
3. Temporally allocate emissions from the annual emissions inventories
4. Speciate emissions for some chemical mechanism
5. Output emissions for an air quality model

A more detailed discussion concerning the spatial and temporal allocations of annual emissions data is provided in the modeling protocol at section 2.7, "Emissions Inputs."

B. Seasonal Temperature Adjustments

The model makes the temperature adjustments based on National Weather Service (NWS) data from appropriate meteorological sites.

On-road Mobile Sources

A separate on-road mobile source emission inventory will be prepared for each separate episode day. Inputs for temperature and absolute humidity will be obtained from representative monitors in each county. The University of Utah Department of Meteorology MESOWEST database or an equivalent source will be used to obtain meteorological data by county.

In addition, all input parameters that are used in MOVES will be appropriate for a winter inventory. These parameters may be different from those used by the MOBILE model (e.g., absolute humidity, RVP of gasoline, ultra-low sulfur diesel (15 ppmw), hourly or daily min/max temperatures, and month of evaluation).

Finally, in the computation of tons per winter weekday or winter weekend day, the appropriate conversion factors from AADT to winter AWKDT or winter AWKNDT will be included. These factors are obtained from the MPO travel demand models when available.

C. Typical Operating Day Emission Rates

SMOKE will be used to calculate peak PM_{2.5} season typical operating day emission rates.

1. Point sources

SCC profiles will be used to adjust the actual annual emission rates to actual daily or hourly emission rates.

2. Area sources

SCC profiles will be used to adjust the annual emission rates to actual daily or hourly emission rates.

3. On-road mobile sources

A separate on-road mobile source emissions inventory will be created for each PM_{2.5} episode day. Each daily inventory will be broken down using the following hierarchy of parameters (in order): calendar year, county, road type, pollutant type, and vehicle type. The daily inventories will then be converted into a compatible format for the SMOKE pre-processor. SMOKE will be used to allocate the emissions spatially and temporally and to speciate the emissions.

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 according to pollutants. Enough information will be included so that the data can be arranged and presented according to:
 - a. Source category
 - b. Non-attainment 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 surveys and data-gathering Web applications will be checked for missing and incomplete data overlooked during the initial verification. 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 surveys, workbooks, 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 and by the IDEQ Air Quality Division Administrator stating that the inventory is complete and accurate to the best of their 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. Sample questionnaires or data-gathering Web application screen captures
 - c. Sources of emission factors including emission factors developed by the agency
 - d. Methods of calculating emissions
 - e. Significant assumptions made during collection and analysis
 - f. Exclusion of known pollution sources
 - g. 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 IPP and notation of any deviations from initial 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. Inventory records will be checked to insure consistent application of procedures for every task performed.
5. The questionnaire design, for point sources, will be updated based on responses from previous inventory requests.
6. Quality is also assured through the use of electronic workbooks. Data calculated or stored in Excel workbooks goes through QA/AC to ensure that the formulae used are accurate and then the cells are locked for protection. This ensures that the subsequent process of data entry did not introduce any errors.
7. Appropriate ranges used to define outliers (data outside the expected range) will be verified.
8. The finalized emission inventory report will be reviewed for completeness no later than one month after the completion date.
9. 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 and IDEQ.
3. An invitation will be sent to EPA to conduct an independent audit of the UDAQ and IDEQ inventory programs.
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.

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