APPENDIX A

Inventory Preparation Plan

Alaska Air Toxics Emission Inventory Preparation Plan

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1. INTRODUCTION

This inventory preparation plan (IPP) has been compiled in accordance with EPA requirements and is designed to serve as both a work plan that documents analysis objectives and a quality assurance plan that identifies review responsibilities. The goal of the effort is to develop toxic emission inventories for a representative set of Alaskan communities. These inventories will be prepared for the 1999 calendar year, with separate estimates for summer versus winter seasons. To maximize representation, this effort will collect information on the two largest population centers, Anchorage and Fairbanks, and a marine community, Juneau. The result will be source-specific gridded toxic emission inventories for each community. In addition, a list of sources, activity levels, and related emission factors will be prepared for a "typical" rural Alaskan community. The results will be used to assess where potential "hot spots" may exist and provide a framework for additional investigations of toxic emission distributions across the state.

Inventories will be prepared for the areas within each of the following jurisdictions:

- Municipality of Anchorage (MOA);
- North Star Borough (FNSB); and
- City and Borough of Juneau (CBJ).

The remainder of this plan is organized as follows: Section 2 describes the methodology to be employed in estimating on-road mobile source emissions. Section 3 provides a similar description for off-road mobile sources. A description of the approach to be used in estimating area sources is presented in Section 4. Section 5 provides a review of the point source methodology. Section 6 presents a detailed discussion of the planned approach to gridding the inventories. The quality assurance plan is presented in Section 7.

2. ON-ROAD MOBILE SOURCES

An on-road motor vehicle inventory is typically generated by simply multiplying motor vehicle activity (i.e., vehicle miles traveled, or VMT) by an emission factor (in grams per mile). In general, the activity data are based on travel forecasts prepared by local Metropolitan Planning Organizations (MPOs), while the emission factors are obtained by running EPA=s MOBILE model. Because this study requires development of toxics emissions inventories, EPA=s current emission factor model, MOBILE5b, will not be used. Instead, a toxics version of the model recently developed under contract to the U.S. Environmental Protection Agency (EPA) will serve as the basis of the emission factor estimates. Separate estimates will be prepared for each of the following vehicle categories:

- Light-duty gasoline vehicles (LDGV);
- Light-duty gasoline trucks (LDGT1), less than 6,000 lbs gross vehicle weight (GVW);
- Light-duty gasoline trucks (LDGT2), 6,000 – 8,500 lbs GVW;
- Heavy-duty gasoline vehicles (HDGV), 8,500+ lbs GVW;
- Light-duty Diesel vehicles (LDDV);
- Light-duty Diesel trucks (LDDT); less than 8,5000 lbs GVW;
- Heavy-duty Diesel Vehicles (HDDV), 8,500 lbs GVW; and
- Motorcycles (MCY).

The specific elements of this task are described below.

<u>Collection of Travel Data</u> - The first step will be to establish contacts at the MPOs in Anchorage, Fairbanks, and Juneau to obtain the latest travel forecast for the 1999 calendar year. Because the inventories are ultimately going to be gridded, the travel information will be obtained in the most disaggregated form possible, including the coordinates of the link end points if those data are available. In addition, differences between summer and winter activity levels will be obtained to the extent that those data exist. If the travel data do not distinguish between summer and winter activity patterns, an estimate of those differences will be made based on monthly fuel sales or other measure of motor vehicle activity.

Both MOA and FNSB are in the process of developing CO emission inventories for the 2000 State Implementation Plan submittal. At a minimum, those efforts will quantify emissions by source category for the base year and 2000 (i.e., the year in which an attainment demonstration is required). Using the data included in both the base year and attainment year inventories, it will be possible to interpolate estimates of fuel sales, population, VMT, etc. for 1999. Separate requests for travel and related data will be submitted to ADOT&PF for Juneau. A screening-level approach will be used to collect relevant data for the selected rural community.

Model Selection - It is anticipated that the MOBTOX5b model would be used to generate toxics emission factors for this effort. The MOBTOX5b model was recently developed under contract to EPA,[*] and was used to generate toxics emissions estimates to support the Tier 2 rulemaking as well as potential toxics regulatory actions required under Section 202(l) of the 1990 Clean Air Act Amendments. In addition, it was used to prepare on-road motor vehicle emission factors for the 1996 National Toxics Inventory.

Although MOBTOX5b was based on the MOBILE5b model, a number of modifications were made to ensure the toxics estimates reflected the latest information on motor vehicle emissions. As much as possible, those revisions were designed to mimic the changes that are currently being incorporated into MOBILE6. In particular:

- Base emission rates were modified to reflect the lower deterioration rates anticipated for newer technology vehicles;

- Off-cycle effects were incorporated into the model to account for aggressive driving behavior not captured in MOBILE5b;

- Revised fuel effects were incorporated to better reflect the impact of gasoline sulfur levels; and

- Fleet characteristics (i.e., age distributions, mileage accumulation rates, and the mix between cars and light trucks) were modified to reflect more recent data on the make-up and usage of the in-use fleet.

The MOBTOX5b model calculates emissions of benzene, acetaldehyde, formaldehyde, 1,3-butadiene, and MTBE. In addition, total organic gas (TOG) emissions are calculated by the model. This is important because calculation of emission rates for other compounds on the list of Hazardous Air Pollutants (e.g., acrolein) will be based on applying a toxics fraction to the TOG estimate. Those toxics fractions will likely be based on EPA or CARB published speciation profiles, although other sources of information will also be investigated.

A revised version of EPA's PART5 model will also be used to prepare estimates of Diesel particulate matter (PM). The revised version of this model, which includes more recent emission factor estimates for light-duty Diesel vehicles, was also developed under contract to EPA. It is anticipated that the Diesel PM estimates would be used as the basis of the polycyclic organic matter estimates prepared for this inventory.

[*] "Analysis of the Impacts of Control Programs on Motor Vehicle Toxics Emissions and Exposure in Urban Areas and Nationwide," Prepared by Sierra Research for the U.S. Environmental Protection Agency, Report No. SR99-11-02, November 30, 1999.

Input File Preparation - Separate MOBILE input files would be prepared for each of the study areas and for each season under consideration. The standard MOBILE model inputs would be included in this effort, including vehicle age distribution, mileage accumulation rates, ambient temperatures, operating mode fractions, I/M program specifications, etc. In addition, the MOBTOX5b model requires the following files to be developed for each model run:

- "Toxic-TOG curves," which reflect the exhaust emissions impacts of specific fuel formulations (e.g., sulfur, RVP, aromatics content, benzene content, oxygenate type and content, etc.);

- Evaporative fractions, which reflect the fraction of toxic compounds (e.g., benzene, MTBE) in evaporative emissions; and

- Off-cycle correction factors, which account for aggressive driving behavior.

Finally, alternative base emission rate equations would be incorporated into this analysis consistent with those developed by EPA for the Tier 2 rulemaking.

It should be noted that the development of the Toxic-TOG curves required by the MOBTOX5b model is not a simple process, requiring output from EPA's Complex model to be merged with data on emission control system configuration by model year within a FORTRAN routine.

Because fuel specifications can have a substantial impact on emissions of air toxics from motor vehicles, it is important to ensure that the fuel specifications used in this analysis match those of each study area for summer and winter conditions. Although fuel specification data are available for Fairbanks through the American Automobile Manufacturers Association's (AAMA's) annual fuel surveys,* similar data are not readily available for Anchorage and Juneau (nor for rural areas of Alaska). As a result, some effort will be devoted to obtaining appropriate fuel data for use in this study (e.g., through oil industry contacts). If data are not forthcoming through those sources, gasoline sampling and analysis will be considered.

Inventory Preparation - Once the input files are generated for each study area and season, the MOBTOX5b model will be run. The resulting emission factors will then be combined with the link-specific travel forecasts to arrive at a toxics emission inventory for each area and season. It is anticipated that much of this effort would be directed at developing a computer program (likely written in FORTRAN) to automate this process as much as possible. Automating this process may require more "up-front" effort, but in the long run will result in less effort devoted to QC. In addition, if mid-course corrections or adjustments to model inputs are necessary, those can be made with the knowledge that re-calculating the inventory is not a limiting factor. The output format would be developed

* With the disbanding of AAMA, these surveys are now sponsored by the Alliance of Automobile Manufacturers.

in consultation with ADEC to ensure that the results could be used directly in any potential submittal to EPA and in the development of the gridded inventory.

3. OFF-ROAD MOBILE SOURCES

In general, off-road mobile sources include aircraft, trains, ships, and a variety of equipment types employed in construction, maintenance, and recreation. EPA has developed a model entitled "NONROAD" to estimate emissions for the latter category of equipment types. The FAA has prepared a model to address aircraft emissions, and EPA has defined emission factors for quantifying emissions from trains and ships. Regardless of the source category, inventories are generally developed using the following approach:

Emissions (tons per day) = Population * Annual Usage * Seasonal Use Factor
* Emission Factor * Load Factor

The three elements on the first line of the above equation generally reflect overall source activity, while the two elements on the second line reflect an emission rate. The specific approach proposed to develop the off-road mobile source inventory for this study is summarized below.

Nonroad Equipment

<u>Activity Levels</u> - The first step in this effort will be to identify the different types of equipment used in the communities selected for analysis as well as in rural areas of Alaska. As a starting point for this analysis, EPA's NONROAD model will be reviewed for both equipment types and activity levels specific to Alaska. That model has been formatted such that off-road equipment populations and usage (i.e., hours per year) are estimated for each county in the U.S. However, estimates from this model must be reviewed carefully for reasonableness. That is because the NONROAD model uses a "top-down" approach in which state-level equipment populations are allocated to counties on the basis of activity indicators that are specific to certain equipment types. For example, if the activity indicator is based on the number of businesses within a particular SIC code and those businesses are based primarily in Anchorage and Fairbanks, the model can over-allocate the equipment to those communities and ignore usage that occurs outside those areas. To illustrate this point, a run of the NONROAD model identified the following 15 sources as accounting for 77 percent of the CO emitted on a typical winter day during 1999 in Fairbanks.

- Air Compressors;
- All Terrain Vehicles\Motorcycles;
- Concrete\Industrial Saws;
- Gas Compressors;
- Generator Sets;
- Lawn & Garden Tractors;

- Lawn Mowers;
- Other Underground Mining Equipment;
- Paving Equipment;
- Pressure Washers;
- Pumps;
- Snow blowers;
- Snowmobiles;
- Tractors/Loaders/Backhoes; and
- Welders.

The largest source, with over 24% of the CO emitted for nonroad vehicles, was all-terrain vehicles\motorcycles. Snow machines were ranked second with 14% of the CO emissions. Clearly, these findings warrant some investigation, as it is unlikely that all-terrain vehicles\motorcycle activity levels are the dominant source of nonroad CO during the winter. This points out that it is important to properly quantify seasonal equipment usage when generating the activity estimates. For example, all-terrain vehicles\motorcycles are likely to be used primarily during the summer and snow blowers during the winter. Large construction equipment (e.g., road graders) operation is likely to be much greater in the summer than in the winter.

As noted in the RFP, development of snow machine activity deserves special attention because it is expected that snow machine use will be a primary emission source in the winter. In previous efforts to prepare CO emission inventories for Anchorage and Fairbanks, snow machine usage was identified as a primary emission source. Recent surveys of snow machine registration and activity levels will be obtained from the Alaska Department of Transportation and Public Facilities (ADOT&PF). To the extent possible, recent data gathered for the development of the serious area CO inventories will be used to support the development of the toxics emissions inventories.

<u>Emission Models</u> - It is expected that the primary emission model that will be used to generate hydrocarbon (or TOG) emission factors for off-road mobile sources is EPA's NONROAD model. Although that model combines equipment activity and emissions to generate county-level inventories, it is unlikely that it will be used in this mode. Depending on the results of the review conducted above, separate estimates of population and usage may be necessary. If that were the case, then the emission factors (and load factors) from the NONROAD model would be used in this effort. A preliminary review of the model indicates that the emission factors within that model are the most current available.

Because the NONROAD model does not provide emission estimates for commercial marine vessels, locomotives, and aircraft, it will be necessary to separately estimate emission factors (and activity) from these sources. The approach used to generate these estimates will follow EPA guidelines spelled out in AP-42 or other appropriate information source.
The emission rates of air toxics will be estimated by applying a speciation profile to the hydrocarbon emission factors. A review of EPA and CARB documents related to off-road equipment air toxics will be necessary to determine the appropriate toxics fractions

for each non-road source. For example, EPA=s 1991 Nonroad Engine and Vehicle Emission Study included estimates of benzene, 1,3-butadiene, aldehydes (as a general class), and nitrosamines, and testing conducted by Southwest Research Institute in 1991 on small utility engines used in lawn and garden equipment included detailed estimates of aldehydes and ketones (including formaldehyde, acetaldehyde, acrolein, and propionaldehyde) that could be used to develop appropriate profiles for use in this inventory.

Aircraft

Contacts have been established with the airports in Anchorage, Fairbanks and Juneau and requests for data on landings and take offs (LTOs) have been requested for calendar year 1999. That data will be input into the Federal Aviation Administration=s (FAA=s) Emissions Dispersion Modeling System (EDMS) to prepare emission estimates for both aircraft and airport ground support equipment for the commercial airports and military bases. A separate methodology that relies on average aircraft emissions and LTOs will be used to compute emissions for general aviation fields. A similar methodology is planned for computing estimates of HC from aircraft operations in each of the communities. An approach to speciation similar to the one outlined above for the nonroad equipment will be followed.

The FAA collects data on flight operations at each of the major U.S. airfields for U.S. flag aircraft that have a minimum of 60 seats. A summary of specific LTOs by aircraft body (e.g., 727-200, etc.) is collected for each commercial airport and published annually for the preceding year (e.g., 1998 data are published in 1999, etc.). Additional data are required to document LTOs for foreign flag carriers and for smaller aircraft. Contacts have been established with the towers at each of the airports in each community to collect these data for 1999. The published FAA data will be obtained for each of the airports and contacts will be established at the towers to obtain the remaining data on LTOs required to prepare emission inventory estimates.

Anchorage - Contacts have been established with personnel at the following airports:

- Anchorage International Airport including Lake Hood,
- Merrill Field,
- Elmendorf Air Force Base, and
- Fort Richardson.

Fairbanks - Contacts have been established with personnel at the following airports:

- Fairbanks International Airport,
- Eielson Air Force Base,
- Metro Field, and
- Fort Wainwright Army Air Field.

Juneau - Contacts have been established with personnel at Juneau International Airport.

Rail

Contacts have been established with Alaska Railroad (ARR) for information on fuel consumption in terminal operations and line haul activity with the boundaries of Anchorage and Fairbanks (there is no rail activity in Juneau). Emission estimates will be calculated by multiplying the fuel consumption information by updated emission factors for railway locomotive operation.* An approach to speciation similar to the one outlined above for the nonroad equipment will be followed.

Vessels

There is no significant vessel activity in Fairbanks. For Anchorage, contacts have been established with the Port of Anchorage to obtain data on daily activity levels and related fuel consumption levels in 1999. Similar requests have been made to fuel suppliers and related contacts (e.g., agencies responsible for tracking cruise ships, etc.) in Juneau. Emissions will be computed by multiplying fuel consumption estimates by emission factors recently developed by EPA for marine vessels. An approach to speciation similar to the one outlined above for the nonroad equipment will be followed.

Inventory Development

Once the activity levels and emission factors are determined for each source, development of the inventory is a simple matter of multiplying one by the other. Source specific speciation profiles will then be applied to the HC emission estimates. Of greater difficulty will be spatially allocating the emission inventory of each equipment type to develop a gridded inventory. It is likely that some sources, such as snowblowers, would be allocated to grid cell on the basis of residential population, while others, such as snow machines, would be allocated based on the location of trails. Spatial allocation of equipment usage will be kept in mind during the review of activity levels outlined above, since it will be an integral component of the gridded inventory development. A more detailed discussion of these issues is presented in Section 6.

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* "Feasibility and Cost-Effectiveness of Controlling Emissions from Diesel Engines in Rail, Marine, Construction, Farm, and Other Mobile Off-Highway Equipment," prepared by Radian Corporation, for U.S. EPA, February 1988.

4. AREA SOURCES

While some small, dispersed sources like dry cleaning shops, plating shops, and gasoline-dispensing facilities have emissions through stacks or vents, they are often considered area sources for inventory and/or regulatory purposes. Typically, area sources include all stationary sources that are not major sources of hazardous air pollutants (HAPs) as defined in the Clean Air Act (greater than 10 tons per year [tpy] of an individual HAP or 25 typ of total HAPs). For purposes of this inventory, however, it is not important whether a facility is a major source of HAPs, and therefore it is convenient to include all facilities with air quality permits or with operating permit applications as stationary sources (it is easy to reclassify permitted, non-major HAP sources as area sources if federal protocols require it). Therefore, it is suggested that area sources be defined for this inventory as stationary, unpermitted emission sources.

Significant area sources are likely to include commercial, institutional, and residential heating, and residential wood combustion. As a result, typical summer and winter consumption rates will be obtained for the following fuel types:

- natural gas (Anchorage only);
- fuel oil;
- coal (Fairbanks only);
- propane; and
- wood.

Relevant AP-42 emission factors will be screened to identify other significant area HAP sources. In most cases these sources may be small, but numerous. Examples include open burning, prescribed burning, forest fires, and structural fires.

For those sources where ADEC does not have preexisting inventory data, these sources may be evaluated using population-based or similar factors to calculate the emissions. In this case, effort would be spent evaluating activity level and emissions using rates per capita, per household, per registered motor vehicle, or other units. Where locations are known, this information will be tracked. Otherwise, population densities, zoning information, or other methods to locate area sources will be applied. The four military bases (Elmendorf and Eielson AFBs; Forts Richardson and Wainwright) within the study area will receive special attention due to the likely significance in the total emissions. Where activity levels or emission factors are not available, emissions of volatile organic compounds (VOCs) or PM from the area source category will be used and HAPs emissions will be apportioned using speciation data. For example, if overall emissions from dry cleaning are known, perchloroethylene emissions could be estimated using the industry averages of perchloroethylene dry cleaning and petroleum-based solvent dry cleaning.

To the extent that emissions are seasonal, the HAPs emissions will be apportioned for winter and summer. Examples where activity levels are expected to vary seasonally include residential wood combustion, residential/commercial/institution heating, and architectural coatings. The seasonal activity levels will be based on past inventories, air quality plans, fuel sales, or other appropriate information.

5. POINT SOURCES

Data will be obtained from ADEC on permitted facilities, or facilities with operating permit applications, located in Anchorage, Fairbanks, and Juneau. All facilities required to have air quality construction or operating permits will be inventoried using ADEC=s point source methodology even though some of them may be classified as area sources. To the extent it is available, facility information should include the type of source (e.g., power plants, refineries, incinerators, tank farms, etc.), physical location (e.g., Universal Transverse Mercator coordinates), and process or operational data (e.g., throughput, fuel combustion rates, hours of operation, etc.). Each facility will be gridded as a single source (i.e., the emissions from individual sources within a facility will be aggregated). If coordinates are not available from ADEC, coordinates will be based on street addresses.

Appropriate emission factors will be obtained for HAPs emitted by each facility. To the extent feasible, emission factors will be obtained from EPA and the California Air Resources Board (CARB) sources, including:

- EPA's *Compilation of Air Pollutant Emission Factors*;
- EPA's *Locating and Estimating* series for toxic air pollutants;
- Background documentation for development of National Emission Standards for Hazardous Air Pollutants;
- EPA's Factor Information Retrieval (FIRE) database;
- EPA's SPECIATE database; and
- California Air Toxics Emission Factor database.

Emission factors from these sources are typically expressed in units of mass HAP emitted per unit of activity, where such units may be fuel consumption, power rating, throughput, material consumption, or other units. If source-specific factors for HAPs are not available, VOC or PM emission will be used together with speciation data (e.g., mass of HAP per mass of VOC) from EPA or CARB documents.

Activity levels for 1999 should be readily available from facility operating reports. Effort will be devoted to the collection of available reports for 1999 in each inventory area. Some facilities file reports quarterly and therefore seasonal data can be easily obtained. For facilities that file semi-annually, winter and summer emission allocations will be based on knowledge of the facility operation or information available from ADEC.

A separate methodology will be developed for rural areas. It will provide a range of emission factors for a representative set of source types and provide an approach for collecting activity information. Contacts will be established with one or more rural areas to identify the source types to be addressed.

6. GRIDDING

Source-specific toxic inventory emissions will be spatially gridded into a uniform, rectangular grid system. The size and areal extent of the grid cells will be defined in consultation with ADEC. (Typical cell sizes range from 1 km to 10 km, depending on the resultant use of the inventory.) Separate spatial gridding methodologies will be applied for on-road mobile, off-road mobile, area, and point sources as described below. These methods would rely on FORTRAN software developed by Sierra for spatially allocating emission sources. An alternative approach would be to use ArcView mapping software. The two approaches will be investigated and a joint decision will be made with ADEC to select the optimal methodology.

On-Road Mobile Sources - For Anchorage, Fairbanks, and possibly Juneau (depending on the level of detail in the available data), on-road toxic mobile source emissions will be spatially allocated into grid cells based on roadway link-level emission estimates developed under Task 2.

For communities in which link-level travel activity data are not available (i.e., rural communities), a spatial allocation scheme using GIS-based demographic survey or other surrogates (see "Area Sources" below) will be developed if sufficient data are available to support the calculations and only after consultation with ADEC.

Off-Road Mobile Sources - The primary sources of off-road mobile source toxic emissions are expected to include aircraft, marine vessels, and, in wintertime, snow machines. Discussions will be held with responsible agencies and contacts in each community to identify those specific sub-areas (and resulting grid cells) in which emissions from each of these types of source categories occur. For example, snowmobile usage will be allocated into grid cells corresponding to areas within the community in which they are heavily used. Similarly, marine vessel emissions will be allocated into shipping lane-based grid cells.

Area Sources - Stationary area source emissions will be spatially allocated to appropriate grid cells based upon available category-specific geographic usage patterns obtained from recently completed GIS-based demographic survey data. The availability of these GIS-based usage data will be determined from discussions with community planning departments. For those local areas for which such data exist, they will be used to allocate regionally developed area source emissions into specific grid cells based upon surveyed usage patterns. These spatial allocations will be performed on a category-specific basis using appropriate metrics as available in the demographic data. For example, households per square mile is a better spatial usage indicator of residential fuel combustion than population per square mile. For communities or area source categories for which appropriate spatial usage data are not available, emissions will be allocated uniformly into grid cells across the inventory domain. These latter instances will be clearly documented.

Point Sources - Of the four major source categories, point sources are the easiest to grid. By definition, point sources represent emissions from a single location. Thus, the emissions for each toxic point source will simply be allocated into the appropriate grid cell based on the coordinates of each separate point source.

This approach assumes that vertical gridding of the toxic inventory will not be required. Vertically gridded inventories are typically used only for photochemical and transport grid modeling of broad urbanized areas. In Alaska, the only non-ground-level emission sources are expected to be combustion stacks (e.g., from power plants) and aircraft. Thus, emissions from these categories will simply be gridded into a single vertical depth, which will be established in consultation with the Project Manager.

Finally, separate gridded inventories will be developed for both winter and summer for source categories that exhibit significant differences in spatial patterns between seasons. Snow machines are the most obvious example, but other categories will be evaluated for large seasonal differences in spatial patterns.

7. QUALITY ASSURANCE PLAN

Quality Assurance/Quality Control (QA/QC) procedures described in this plan were developed to ensure data accuracy, completeness, representativeness, and comparability. These procedures will be implemented throughout the planning, data collection, emission estimation, and reporting phases of the inventory development program. ADEC staff will take the lead in tracking the implementation of these procedures.

QC procedures that will be implemented during the inventory development process include the following:

- <u>Data Collection</u> - As described in the previous sections, data collection will be patterned after existing CO emission inventory development efforts that are governed by EPA-approved procedures.

- <u>Data Documentation</u> - All activities will be documented in notebooks with indices to facilitate the retrieval of recorded information. A notebook will be assigned to each team member and it will be used only to record information relative to the development of the inventory. To facilitate review, all entries will be made in a computer file (using Microsoft WORD) and uploaded to Q/A personnel for review. Records of contacts (e.g., agency, group, company, phone number, etc.) will be documented.

- <u>Emission Calculation</u> - The procedures to be followed in developing on-road, non-road mobile, area, and point source emission estimates were detailed in Sections 2 through 5. All changes to these procedures will be documented and submitted to ADEC for review and comment.

- <u>Reporting</u> - Prior to finalizing the report, all of the actions taken in response to the recommendations for corrective action will be evaluated to determine whether the report accurately reflects the corrections made.

QA activities are not directly involved in the development of the inventory and would normally include assessments of the effectiveness and appropriateness of the systems established by management to control data quality. This includes the management and supervision of the work. Specific steps involve Q/A training and a series of independent audits to assess the effectiveness of the QC system and management of inventory development activities. With the exception of the latter step (i.e., management, which will be addressed during the course of the effort), these activities are literally beyond the budget and scope of this project. More importantly, it is premature to initiate these efforts, because the inventories developed under this project will be the first for Alaska.

For that reason, all efforts will be focused on QC procedures to ensure that the results of this initial effort will be based on the best data possible. It would be prudent, however, to implement QA procedures in subsequent air toxic emission inventory development efforts.