



MOBILE5 Information Sheet #7

NO_x Benefits of Reformulated Gasoline Using MOBILE5a



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September 30, 1998

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I. Introduction

MOBILE5 Information sheets are a series of documents intended to give users detailed information about techniques that can be used to more accurately model highway mobile source emissions and avoid potential errors or resolve limitations to modeling capabilities. When referring to MOBILE5 in this and other Information Sheets, we will mean the latest officially released version of the MOBILE model, unless otherwise specifically noted. At the time of this Information Sheet, two versions of the model were actively being used. The most current version of the model, MOBILE5b, was released in October of 1996 while the other version, MOBILE5a, was released in March of 1993.

All of the MOBILE5 Information Sheets will be made available on the EPA Office of Mobile Sources site on the World Wide Web (WWW). The WWW site is available to users 24 hours a day, 7 days a week, and may be reached at "<http://www.epa.gov/OMSWWW/>".

If you would like to be added to our mailing list, please follow the instructions included in the last section of the Information Sheet. This only need be done once. You do not need to send in this information if you are already on our mailing list.

II. Problem Description

When the original MOBILE5 was released in December 1992 and updated in March 1993 (MOBILE5a), the final rules for federal Reformulated Gasoline (RFG) had not yet been finalized. As a result, the original MOBILE5 (and MOBILE5a) RFG benefits were based on the proposed rule, which did not include NO_x benefits. When MOBILE5b was released in October 1996, it included updated estimates of RFG benefits, including the effect of RFG on NO_x emissions. Most States, however, had already completed most of their emission estimates using MOBILE5a. Any area can properly determine the NO_x benefits of RFG as described in the final rule by using

MOBILE5b. This is the most accurate method available and is the recommended approach for calculating the benefits of RFG. However, some areas requested a method to calculate the appropriate reductions in NOx emissions without repeating their inventory analysis. Although it is not the preferred approach, a solution is offered below for those areas who are unable to repeat their inventory analysis using the MOBILE5b model.

III. Remedy

MOBILE5b includes the effect of the final RFG rules on NOx emissions. When possible, users should make all highway vehicle estimates using the latest version of the MOBILE model. Users must never directly compare vehicle emission estimates based on MOBILE5a results with other estimates based on MOBILE5b. This policy is discussed in the memorandum to the EPA Regional Office Air Directors dated August 11, 1997, "Summary of Comments on and Guidance for Use of MOBILE5b" from Philip A. Lorang, the Director of the Assessment and Modeling Division of the Office of Mobile Sources available on our web site at:

<http://www.epa.gov/omswwww/m5.htm>

However, users calculating NOx benefits from federal Reformulated Gasoline (RFG) and who are unable to repeat their inventory analysis using the MOBILE5b model could use MOBILE5b results to adjust inventories based on MOBILE5a results if the input parameters of the MOBILE5a and MOBILE5b runs are carefully matched. The estimate can be made following three steps:

- Run MOBILE5b with and without RFG by using the RFGFLAG (Section 2.2.16.1 in the updated September 1996 MOBILE5 User Guide).
- Calculate the difference in NOx emissions ("without RFG" minus "with RFG" results). Divide this difference by the MOBILE5b results without RFG. This is the fractional NOx RFG benefit.
- Multiply the NOx emissions, based on MOBILE5a, by the fractional NOx RFG benefit. This will be the estimate of NOx emission benefit from RFG.

The MOBILE5b runs must use the same local parameters as were used in the original MOBILE5a runs. When preparing submissions for EPA, users must always consult with the appropriate EPA Regional office to determine the amount of aggregation of scenarios for the MOBILE5b runs that will be allowed. Depending on the variety of conditions modeled in the inventory, more than one fractional NOx RFG benefit based on MOBILE5b may be needed. For example, areas which calculate inventories separately by county would likely need to calculate at least a separate fractional NOx benefit determined for each county. Alternatively, inventories that are aggregates of MOBILE5a runs that used the same fleet characteristics (i.e., registration

distributions) would be good candidates for adjustment using a single, MOBILE5b based, fractional NOx RFG benefit. The fractional NOx benefit should be relatively insensitive to differences in speed, temperature and operating mode.

IV. Additional Information/ Listserver Subscription

The Emission Inventory Group, Assessment and Modeling Division, EPA Office of Mobile Sources sponsors a listserver named EPA-MOBILENEWS. A listserver is an electronic mailing list service that will send messages to the all of the persons with e-mail addresses who have "subscribed" to that particular listserver. This listserver has largely replaced physical mailings of information to parties interested in the MOBILE model, as well as others interested in general mobile source emission factor and inventory information (including particulate emissions and the PART emission factor model, and nonroad mobile sources).

To subscribe to the EPA-MOBILENEWS listserver send the following message:

subscribe EPA-MOBILENEWS FIRSTNAME LASTNAME

where FIRSTNAME and LASTNAME is your name (for example: Fred Flintstone) to the EPA List server address. The list server e-mail address is:

listserver@unixmail.rtpnc.epa.gov

Your e-mail address will then be added to the list of subscribers and a confirmation message will be sent to your e-mail address. Whenever a message is posted to the EPA-MOBILENEWS listserver by the listserver owner (The Assessment and Modeling Division of the EPA Office of Mobile Sources), a copy of that message will be sent to every person who has subscribed.

You can remove yourself from the list by sending another message to the listserver address. This message must be sent from the same e-mail address that you used to subscribe, and must contain the message:

unsubscribe EPA-MOBILENEWS

If you are interested in highway vehicle emission factors, including particulate matter, the MOBILE and PART emission factor models, and non-road vehicle emission factors and modeling, as well as guidance issued from OMS on the use of these models and development of emission inventories for all mobile sources, the Emission Inventory Group encourages you to take advantage of the EPA-MOBILENEWS listserver as the best and most efficient way to get up-to-date information about these issues.

We recognize that some parties interested in these topics may not be able to subscribe to the listserv, and will continue to mail paper copies of information to those parties on request. If you cannot subscribe to the EPA-MOBILENEWS listserv at this time and wish to continue to receive paper copies of information by regular mail, please mail or fax your current information (name, company name, mailing address, phone and fax numbers) to us at the address below and clearly indicate that you wish to continue receiving paper copies of all information distributed over the listserv. Send this request to:

MOBILE/PART Mailing Lists
US EPA NVFEL
Assessment and Modeling Division
2000 Traverwood
Ann Arbor, MI 48105

or fax the information to: 734/214-4939

and note "Attention: MOBILE/PART Mailing Lists" on the fax.