

APPENDIX T

ESTIMATION OF THE BENEFITS FROM THE TIER 2/LOW SULFUR
RULEMAKING FOR LIGHT-DUTY VEHICLES AND TRUCKS

DALLAS/FORT WORTH ATTAINMENT DEMONSTRATION

APRIL 2000 REVISION

Estimation of the Benefits from the Tier 2/Low Sulfur Rulemaking for Light-Duty Vehicles and Trucks

Under contract to the TNRCC in February of 2000, Eastern Research Group (ERG) utilized the recently available Tier 2 spreadsheet model from EPA to calculate the benefits to be accrued from the implementation of the final Tier 2/Low Sulfur rulemaking. ERG had performed similar Tier 2 benefit analyses for TNRCC in 1999. However, in developing these “older” Tier 2 benefit estimates in 1999, ERG was unable to use EPA’s Tier 2 spreadsheet model, which was not made available until December of 1999. Nonetheless, these estimates were needed for the purposes of developing satisfactory 2007 mobile source inventories in the Dallas/Fort Worth and Houston/Galveston areas.

ERG obtained the “newer” Tier 2 benefit estimates in tons-per-day by combining the emission factor output (in grams/mile) from the Tier 2 spreadsheet model with vehicle miles traveled (VMT) estimates for various Texas counties. The TNRCC then compared the Tier 2 benefits for each county (or county grouping) with the pre-Tier 2 mobile source inventory estimates for those counties in order to obtain Tier 2 benefit adjustment factors. These factors were then applied to the mobile source inventory which was developed for input into the urban airshed model. This approach was approved by EPA as indicated in the following 3/17/00 E-mail from John Koupal to Rick Baker from ERG:

Subject: Benefits for control measures in the context of Tier 2
Author: JOHN KOU PAL <KOU PAL.JOHN@epamail.epa.gov>
Date: 3/17/00 12:59 PM

Rick,

We've discussed within OTAG and with Region 6 the issue of how to calculate benefits for additional control programs in the context of Tier 2. Instead of proceeding with the "ratio" approach you proposed, we would rather have you use MOBILE5 directly for evaluating the TPD benefit of a given control measure. For I/M, run MOBILE5 with and without I/M and take the delta TPD emissions as the benefit, without regard to Tier 2. The Tier 2 reductions should be considered a separable TPD benefit, independent of MOBILE5 credit for additional control measures. If you have questions, please give me a call.

It should be noted that the development of these “model-ready” mobile source inventories requires much time and computer processing. Therefore, it is not feasible to redevelop the entire mobile source inventory to test just one base case or control strategy scenario. Instead, adjustment factors for various rulemakings and control strategies (e.g., Tier 2, Inspection/Maintenance options, Reformulated Gasoline coverage, etc.) are applied to the inventory as a whole prior to input into the urban airshed model. It should also be noted that the Tier 2 spreadsheet model is based on data from EPA’s forthcoming MOBILE6 model. The current mobile source inventories for Texas are based on MOBILE5, which is EPA’s most recently available mobile emissions estimation model. MOBILE5 does not have the capability to provide benefit estimates for the Tier 2 rulemaking. Consequently, application of these adjustment factors is the only practical method of including Tier 2 benefits in the 2007 urban airshed modeling for the Dallas/Fort Worth area.

The NO_x and VOC Tier 2 benefit adjustment factors that were applied to the urban airshed model are provided below. The benefits vary among the various Texas counties based on factors such as:

- model year distribution within the local fleet;
- whether or not I/M tests are performed;
- whether or not reformulated gasoline (RFG) is in use, etc.

The Tier 2 adjustment factors for Liberty, Chambers, and Waller Counties were applied to the Texas counties within the modeling domain which are not listed below. This approach was taken because of the twelve counties listed in the table, the vehicle fleets in Liberty, Chambers, and Waller are most representative of the fleets in the many “rural” Texas counties.

<i>Counties</i>	<i>Unadjusted Weekday NO_x (tons)</i>	<i>NO_x Tier 2/ Low Sulfur Benefit (tons)</i>	<i>NO_x Tier 2 Adjustment Factor</i>
Dallas & Tarrant	204.4	25.2	0.877
Collin & Denton	53.9	4.5	0.917
Harris	190.1	22.6	0.881
Brazoria, Fort Bend, Galveston, Montgomery	75.6	6.6	0.913
Chambers, Liberty, Waller	15.9	1.4	0.912

<i>Counties</i>	<i>Unadjusted Weekday VOC (tons)</i>	<i>VOC Tier 2/ Low Sulfur Benefit (tons)</i>	<i>VOC Tier 2 Adjustment Factor</i>
Dallas & Tarrant	93.9	5.7	0.939
Collin & Denton	23.9	1.1	0.955
Harris	76.6	3.7	0.952
Brazoria, Fort Bend, Galveston, Montgomery	33.0	1.1	0.965
Chambers, Liberty, Waller	5.9	0.3	0.949

The Dallas/Fort Worth urban airshed modeling performed in 1999 utilized Tier 2 adjustment factors which were developed by ERG prior to availability of the Tier 2 spreadsheet model. Provided below is a comparison of the old and new Tier 2 adjustment factors. Overall, relatively minor differences exist between these old and new adjustment factors. Such minor differences highlight the excellent analytical work of ERG in predicting what the Tier 2 benefits would be in 2007 without the advantage of having EPA’s Tier 2 spreadsheet model.

<i>Counties</i>	<i>New NO_x Tier 2 Adjustment Factor</i>	<i>Old NO_x Tier 2 Adjustment Factor</i>
Dallas & Tarrant	0.877	0.880
Collin & Denton	0.917	0.863
Harris	0.881	0.877
Brazoria, Fort Bend, Galveston, Montgomery	0.913	0.886
Chambers, Liberty, Waller	0.912	0.918

<i>Counties</i>	<i>New VOC Tier 2 Adjustment Factor</i>	<i>Old VOC Tier 2 Adjustment Factor</i>
Dallas & Tarrant	0.939	0.941
Collin & Denton	0.955	0.934
Harris	0.952	0.940
Brazoria, Fort Bend, Galveston, Montgomery	0.965	0.940
Chambers, Liberty, Waller	0.949	0.945

Any additional questions with reference to development and application of these Tier 2 adjustment factors should be forwarded to Mr. Chris Kite of the TNRCC at (512)239-1959 or <ckite@tnrcc.state.tx.us>.