EMFAC Modeling Change Technical Memo

**SUBJECT:** REVISE IMPLEMENTATION DATES FOR PHASE 3 GASOLINE

**LEAD:** BEN HANCOCK

# SUMMARY

Phase 3 Reformulated Gasoline, in which the additive MTBE has been eliminated, was scheduled for mandatory introduction no later than December 31, 2002. The benefits were estimated to be about a two-percent reduction in oxides of nitrogen (NOx) and about a 30-percent reduction in sulfur dioxide. In the EMFAC model, emission benefits are calculated by applying a correction factor to the basic emission rate (BER). The fuel correction factors for RFG3 (phase 3 reformulated gasoline) are now applied in the model starting in calendar year 2003.

On March 14, 2002, Governor Davis issued Executive Order D-52-02 to postpone for one year the prohibitions of the use of MTBE and other specified oxygenates in California gasoline and the related requirements for California Phase 3 reformulated gasoline. On July 25, 2002, the Air Resources Board modified the California Phase 3 Reformulated Gasoline (CaRFG3) regulations to incorporate these changes. Thus, this model change is to accommodate this one-year delay.

Even with the one-year delay in the implementation date, much of the gasoline will still achieve the original benefits. Based on discussions with refiners and others, the staff expects about one half of the gasoline to achieve the benefits of Phase 3 gasoline. In addition, no change is expected in the projected sulfur levels in the fuel. Therefore, the staff has reduced the oxides of nitrogen benefits for 2003 by one half. No change to the sulfur level has been made, resulting in no change to the sulfur dioxide levels.

The emission inventory effect is an increase of about 10 tons per day of NOx for 2003 only.

# NEED FOR REVISION

# On March 14, 2002, Governor Davis issued Executive Order D-52-02 to postpone for one year the prohibitions of the use of MTBE and other specified oxygenates in California gasoline and the related requirements for CaRFG3. On July 25, 2002, the ARB modified the California Phase 3 Reformulated Gasoline (CaRFG3) regulations (13 CCR §2261 *et seq*.) to incorporate these changes.

**AFFECTED SOURCE CODE/VERSION**

CALC\_BER\_CF.for (8/17/2001).

## METHODOLOGY FOR REVISION

In the correction factor routine, the onset date for Phase 3 fuel correction factors that resulted in NOx reductions was changed from 2003 to 2004. For 2003, the fuel correction factors were 50% weighted to RFG2 and 50% to RFG3.

# INVENTORY EFFECTS

The change will affect NOx emissions from gasoline-fueled vehicles in calendar year 2003 only. The compositional change for RFG3 would lower the fleet-average NOx emission rate for light trucks and cars from 1.02 g/mi to 0.99 g/mi, which represents a four percent change. However, based on discussions with refiners, we expect that half the gasoline sold will comply with RFG3 anyway during the delay year. So the estimated change was halved. This results in a 10 tpd increase in NOx statewide for calendar year 2003. The full benefits of RFG3 will be realized in 2004.

Statewide Emissions, 2003

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 2003 MTBE Phase-out | | | | 2004 MTBE Phase-out | | | |
|  | LDV+MDV+LHDT |  | Total |  | LDV+MDV+LHDT |  | Total |  |
| VMT  (1000 mi/d) | 800,431 |  | 839,754 |  | 800,431 |  | 839,754 |  |
| Pop Reg | 24,103,881 |  | 24,752,700 |  | 24,103,881 |  | 24,752,700 |  |
| Gasoline  (1000 gal/d) | 41,579 |  | 42,135 |  |  |  |  |  |
| Diesel | 836 |  | 7,415 |  |  |  |  |  |
|  | tpd | g/mi | tpd | g/mi | tpd | g/mi | tpd | g/mi |
| ROG\_Exh | 304.4 | 0.3 | 337.1 | 0.4 | 304.4 | 0.3 | 337.1 | 0.4 |
| ROG\_Tot | 898.9 | 1.0 | 967.5 | 1.0 | 898.9 | 1.0 | 967.5 | 1.0 |
| CO\_Tot | 8719.8 | 9.9 | 9329.3 | 10.1 | 8719.8 | 9.9 | 9329.3 | 10.1 |
| NOx\_Tot | 876.6 | 0.99 | 1544.1 | 1.7 | 886 | 1.005 | 1554. | 1.7 |
| CO2\_Tot | 400,100. | 454 | 477,700. | 517 | 400,100. | 454 | 477,700. | 517 |
| SOx | 4.7 | 0.005 | 11.1 | 0.012 | 4.7 | 0.005 | 11.1 | 0.012 |