

January 3, 2011

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EPA-HQ-OAR-2010-0448  
Mail Code: 6102T  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

To Whom It May Concern:

The National Association of Clean Air Agencies (NACAA) appreciates this opportunity to comment on the U.S. Environmental Protection Agency's (EPA's) decision regarding E15 blends, entitled *Partial Grant and Partial Denial of Clean Air Act Waiver Application Submitted by Growth Energy to Increase the Allowable Ethanol Content of Gasoline to 15 Percent; Decision of the Administrator*, as published in the *Federal Register* on November 4, 2010 (75 FR 68094) as well as the agency's proposal, entitled *Regulation to Mitigate the Misfueling of Vehicles and Engines with Gasoline Containing Greater than 10 Volume Percent Ethanol and Modifications to the Reformulated and Conventional Gasoline Programs*, as published in the *Federal Register* on November 4, 2010 (75 FR 68044). NACAA is the association of air pollution control agencies in 52 states and territories and over 165 metropolitan areas across the nation.

The issues raised by the partial granting of the waiver application are of direct relevance to the mission of state and local air pollution control agencies. NACAA recognizes the importance of expanding the use of sustainable alternative fuels and additives with low criteria pollutant and GHG emissions, as well as the need to reduce the nation's reliance on imported petroleum. At the same time, we believe it is essential that efforts to expand the use of renewable transportation fuels be done with strict adherence to public health imperatives underlying the National Ambient Air Quality Standards. Increases in criteria pollutant emissions are not an acceptable tradeoff for increasing the share of ethanol in the nation's gasoline pool.

NACAA recognizes the complexity of this issue and believes it is essential that EPA consider carefully the full range of possible consequences of an E15 waiver, as well as the mitigation measures necessary to offset any possible emissions increases. For example, the use of E15 will result in the increase in oxygen content of gasoline from 2.7 percent (for E10) to 5.5 percent. Such a fuel mixture change when used in Model Year (MY) 2007 and later vehicles covered by EPA's recent waiver decision (as well as other MY vehicles) can affect emission control system efficiency and durability, warranty status and the

operation of onboard diagnostic systems (OBD) and also lead to drivability impacts and increased tailpipe and evaporative emissions of nitrogen oxides (NO<sub>x</sub>) and hydrocarbons (HC).

NACAA is concerned by these potential adverse impacts and believes not only that EPA has not fully addressed or mitigated them in its recent waiver decision, but also that these impacts may be further compounded, and left unaddressed, by future decisions the agency will make regarding additional waivers for E15.

We would like to highlight the following critical issues in particular regarding EPA's November 2010 E15 waiver decision:

- NO<sub>x</sub> emissions are known to increase as the ethanol concentration in gasoline increases; in the case of E15, the oxygen content will increase to 5.5 percent, compared to the E10 baseline of 2.7 percent.
- Higher NO<sub>x</sub> and HC tailpipe emissions may also occur in use due to the possible accelerated deterioration of catalysts resulting from E15 use.
- The use of E15 will also have an impact on vapor pressure and the distillation characteristics of the final fuel formulation.
- Changes to the distillation characteristics resulting from E15 may also affect the Drivability Index (DI) used by auto manufacturers to optimize vehicle performance.
- Maintenance indicator lights may malfunction due to the presence of E15 and affect the OBD system designed to detect and offset excess emission occurrences.
- E15 use will change the solubility properties of the fuel compared to E10.
- The potential for commingling of E15 and E10 blends as a result of EPA's decision creates major uncertainty.
- When granting the E15 waiver, the agency did not fully address the likely use, through misfueling, of E15 by pre-2007 MY vehicles.

We provide further details on the basis of these concerns in the attached Appendix A.

In light of these considerations, we believe additional near-term and longer-term mitigation efforts should be undertaken by EPA. Specifically, we believe the following near-term mitigation measures are necessary if the waiver decision will remain in place:

- 1) Reducing sulfur levels by 5 to 10 parts per million (ppm) for gasoline blendstocks used for E15, to offset any NO<sub>x</sub> increase. This can be readily accomplished by virtually all U.S. refiners with slight adjustments to desulfurization residence times, operating pressures and catalyst density.
- 2) Putting in place immediately an effective program to prevent misfueling. Although the agency has proposed a rule to mitigate misfueling, the proposal contains neither concrete measures that will actually prevent misfueling in practice nor clear criteria for what constitutes ensuring that all reasonable precautions are achieved in practice to avoid misfueling.

Further, given that major U.S. auto manufacturers have indicated that at least 50 percent of their new car production beginning with MY 2012 will be flexible-fuel vehicles (FFVs), EPA should consider requiring the establishment of a minimum number of E85 fueling outlets in nonattainment areas to discourage sub-optimal fueling of these FFVs on conventional gasoline. This would reduce NO<sub>x</sub>, HC and carbon monoxide emissions on a fleet-wide basis.

We also recommend the following longer-term mitigation measures, which we believe are essential to ensure that there is no ongoing emissions backsliding associated with the use of E15 as prescribed:

- 1) Adjusting certification testing requirements for tailpipe and evaporative emission standards using E15 rather than E10.
- 2) Requiring gasoline blendstock adjustment to ensure no, or minor, change in the full distillation curve.
- 3) Updating EPA guidance to original equipment manufacturers regarding the sensitivity of OBD systems to 0.04-pounds-per-square-inch (psi) increases in fuel vapor pressure. (In California, this sensitivity is even greater, as OBD failures are triggered based on 0.02-psi changes.)
- 4) Planning additional testing beyond that already underway at the U.S. Department of Energy. There is a wide range of potential material compatibility concerns; long-term degradation studies should be undertaken to identify any problems with the prolonged use of E15. Real world aging of catalysts, rather than accelerated bench testing, will be important in this regard.
- 5) Providing states with clear guidance on quantifying emissions from E15. In the preamble to the proposed rule to mitigate misfueling EPA indicates that the "Complex Model" that predicts the emissions level of each regulated pollutant based on the measured values of certain gasoline properties will be updated. Other models such as Nonroad 2008, NMIM 2008 and MOVES should also be updated to accommodate the addition of E15 to the fuel supply. EPA should also endeavor to determine what percentage of control systems for all types of vehicles and engines will be damaged from misfueling with E15 and quantify the impact on emissions in the models.

EPA has openly acknowledged that allowing the use of E15 will result in emissions increases. This, in turn, will compromise the ability of state and local air agencies to achieve and sustain clean air and public health goals. We understand that the E15 waiver for MY 2007 and later vehicles is contingent upon 1) EPA's receipt of an application for E15 (to date none has been received) and the agency's response to that application, which will entail registration of the fuel and 2) the agency's promulgation of a final rule for mitigating the potential for misfueling pre-2007 MY vehicles. NACAA urges that the E15 waiver also be contingent upon EPA taking final action, including implementing the near- and longer-term measures we have recommended, to offset any adverse emissions impacts. In addition, if EPA decides to grant an additional waiver for the use of E15 in MY 2001 through 2006 vehicles, the agency should give careful consideration to the issues we have raised and ensure that they are fully addressed before any final action is taken.

Thank you for the opportunity to comment. If you have any questions, please feel free to contact either of us or S. William Becker, NACAA's Executive Director, at 202-624-7864.

Sincerely,



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Massachusetts  
Co-Chair  
NACAA Mobile Sources and Fuels Committee



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**NACAA Comments to EPA on the November 4, 2010  
Partial Grant and Partial Denial of a Requested E15 Waiver and  
Proposed Regulation to Mitigate Misfueling with E15**

**January 3, 2011**

**Appendix A**

- NO<sub>x</sub> emissions are known to increase with increasing ethanol concentration in gasoline.<sup>1</sup> In its analysis, EPA acknowledges that NO<sub>x</sub> emissions could increase 14 percent compared to baseline fuel use, based on the midpoint of the Coordinating Research Council (CRC) study of E10 and E20. A core assumption made by EPA is that there is a 50-percent compliance margin for NO<sub>x</sub> emissions control systems used in MY 2007 and later vehicles, and that such a compliance margin is sufficient to offset any risk of higher NO<sub>x</sub> emissions associated with E15. However, the EPA analysis is based on the drivability and emissions test data for 19 vehicles. Such a small data set is an insufficient basis on which to make such a critical regulatory judgment.<sup>2</sup> EPA's decision to forego any NO<sub>x</sub> mitigation as part of the implementation of the E15 waiver is therefore flawed, inconsistent with known and submitted data by numerous auto manufacturers and in direct contradiction with underlying criteria specified in the Clean Air Act and the National Environmental Policy Act.

For example, EPA failed to consider changing the gasoline feedstock through the use of lower sulfur gasoline, which can offset expected NO<sub>x</sub> increases. This offsetting strategy is at the heart of the NO<sub>x</sub> mitigation reflected in California's Phase 3 gasoline regulation. EPA should therefore strongly consider similar changes to federal gasoline specifications to achieve full direct mitigation of the NO<sub>x</sub> increase associated with additional low-level ethanol blend use.

- Higher NO<sub>x</sub> and HC tailpipe emissions may also occur in use due to the possible accelerated deterioration of catalysts resulting from E15 use. These effects have been documented by several auto manufacturers, which have found lower thermal degradation margins in three-way catalyst systems due to the higher combustion temperature and higher exhaust gas temperature associated with E15 compared to E10.<sup>3</sup> Although in its analysis EPA suggests that such changes may not affect the certification status of in-use vehicles, actual in-use emissions may still increase compared to vehicles operating on E10. EPA's decision should ensure that no backsliding occurs from in-use emission levels, regardless of the certification status of in-use vehicles.
- When granting the E15 waiver, the agency did not fully address the likely use, through misfueling, of E15 by pre-2007 MY vehicles. There may be strong economic incentives for

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<sup>1</sup> The use of E15 will result in a fuel with 5.5 percent oxygen content, compared to the E10 baseline of 2.7 percent.

<sup>2</sup> For example, EPA acknowledges that perhaps up to half of all Tier II cars do not employ fuel trim that would allow for the adjustment of the air-fuel ratio when in open loop operation. EPA's limitation on wide open throttle testing to no greater than 3,500 rpm is another indication of the relatively narrow consideration of the worst-case NO<sub>x</sub> effects associated with E15 use.

<sup>3</sup> There are several catalyst degradation scenarios that can potentially lead to reduced emission control system efficiency due to the use of E15: 1) sintering of active precious metal sites on three-way catalysts, 2) sintering of oxygen storage materials on such catalyst and 3) migration of active materials into inert support materials.

pre-2007 MY vehicles to use E15 if there are major cost advantages to its use, regardless of the labeling requirements ultimately prescribed by EPA. In the absence of additional enforcement mechanisms and deterrents, it is practically impossible to limit such behavior at the retail level if there is no nozzle reconfiguration or some other physical limitation at the point of sale. Additional enforcement mechanisms are needed to augment the label requirements being developed.

- The use of E15 will affect vapor pressure and the distillation characteristics of the final fuel formulation. As a result, the existing margins of compliance built into current evaporative control systems, as well as OBD systems, are at some risk due to the use of E15.<sup>4</sup> Although the Reid Vapor Pressure (RVP) level of E15 is likely to be less than that for E10, due to the non-ideal mixture characteristics of alcohols blended with gasoline, careful attention must be paid to the aggregate volatility impact of E15 introduction. EPA should, at a minimum, identify steps that blenders should take to ensure that the anticipated distillation curve of E15 matches E10 fuel.
- Changes to the distillation characteristics resulting from E15 may also affect the DI used by auto manufacturers to optimize the performance of vehicles. Changes in DI due to E15 have been shown to create noticeable changes in performance of some vehicles and may therefore result in aftermarket tampering to adjust for these differences. Due to the relative paucity of data on this issue, EPA should exercise caution with this decision and postpone final action until such data is available on a large number of test vehicles.
- Maintenance indicator lights (MILs) may malfunction due to the presence of E15 and affect the OBD system designed to detect and offset excess emission occurrences. Conversely, consumers may simply ignore all MIL illumination if they suspect such malfunction indicators are in error due to the use of E15 leading to higher vehicle emissions.
- E15 use will change the solubility properties of the fuel compared to E10. These effects are different from the changes to volatility mentioned earlier. Such changes have been shown to increase HC permeation emissions. EPA provided no analysis of the impact of E15 on permeation emissions. In contrast, California's latest Predictive Model governing ethanol/gasoline blends takes special note of permeation effects of increased ethanol levels in gasoline. Testing by CRC also suggests that the increase in permeation emissions is essentially linear as a function of ethanol content in low-level blends.
- The potential for commingling of E15 and E10 blends as a result of EPA's decision creates major uncertainty. Yet, the issue of commingling was not addressed in the rulemaking. The amount of co-solvents, corrosion inhibitors and stability additives varies depending on the amount and type of oxygenates in the fuel, vapor/liquid relative characteristics, RVP blending values, octane blending values and other factors. While a range of E10 fuels is routinely mixed in-use by consumers who switch brands of fuel, insufficient data exists to assess the impact of commingling E15 with E10 blends. Such in-use blending could conceivably result in a finished blend in the fuel tank that does not have sufficient corrosion inhibitors and stability agents to avoid added material compatibility concerns and/or phase separation during cold temperature operation.

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<sup>4</sup> Vapor canister durability may be affected by the use of E15 despite the fact that the RVP of E15 will be marginally lower than E10. Current canister durability certification testing is only done on E10, for example.