

# **Analysis of and Action on New York State Department of Environmental Conservation's Request for a Waiver of the Oxygen Content Requirement in Federal Reformulated Gasoline**

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Department of Environmental Conservation's  
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Transportation and Regional Programs Division  
Office of Transportation and Air Quality  
U.S. Environmental Protection Agency

**ANALYSIS OF AND ACTION ON  
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OXYGEN CONTENT REQUIREMENT IN FEDERAL REFORMULATED GASOLINE**

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## **I. INTRODUCTION**

The New York reformulated gasoline (RFG) area is required under the Clean Air Act to use RFG containing 2% oxygen by weight, unless that oxygen content requirement is waived by EPA. New York has requested a waiver of the RFG oxygen content requirement for the New York RFG area.<sup>1</sup> This document discusses the Clean Air Act oxygen content requirement for RFG, EPA's authority to waive that requirement, the basis for New York's request for a waiver, and the basis for EPA's determination to deny New York's request. Additional information is available in an accompanying Technical Support Document.

### **A. The RFG Oxygen Content Requirement and EPA's Waiver Authority**

Under the Clean Air Act ("CAA" or "the Act"), 42 U.S.C. § 7545(k)(2)(B), nine geographic areas in non-attainment for the ozone National Ambient Air Quality Standards (NAAQS), as well as other areas that subsequently are reclassified as severe ozone nonattainment areas, are required to use reformulated gasoline. CAA §§ 211(k)(10)(D), 211(k)(5). Certain other ozone non-attainment areas may "opt-in" to the RFG program as a means of addressing their ozone non-attainment problems. CAA §211(k)(6). The Act specifies certain gasoline content requirements for RFG. CAA § 211(k)(2). Of particular importance for New York's request is the Act's requirement concerning the oxygen content of RFG and EPA's authority to waive that requirement.

Section 211(k)(2)(B) of the Act provides:

The oxygen content of the [reformulated] gasoline shall equal or exceed 2.0 percent by weight (subject to a testing tolerance established by the Administrator) except as otherwise required by this Act. The Administrator may waive, in whole or in part, the application of this subparagraph for any ozone nonattainment area upon a determination by the Administrator that compliance with such requirement would prevent or interfere with attainment by the area of a national primary ambient air quality standard.

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<sup>1</sup> The term "New York RFG area" as it is used in this document means the New York State portion of the New York City Consolidated Metropolitan Statistical Area (CMSA) and the opt-in area of Dutchess County, New York.

Thus, EPA has discretion under this section to waive the oxygen content requirement if it determines that compliance with the oxygen content requirement would prevent or interfere with attainment of a primary National Ambient Air Quality Standard (NAAQS) in an ozone nonattainment area. This section requires, at a minimum, that an applicant seeking a waiver must clearly demonstrate the impact of a waiver for each applicable NAAQS. *See Davis v. EPA*, 348 F.3d 772, 779-80 (9<sup>th</sup> Cir. 2003)(affirming EPA's evidentiary standard in the context of EPA's denial of California's waiver request.)<sup>2</sup> EPA may take into consideration other available information in evaluating a request for a waiver.<sup>3</sup>

A key threshold question before the Agency when considering such a request is whether there has been a clear demonstration of the air quality impacts of a waiver of the RFG oxygen content requirement. To address the air quality impacts of a waiver, one must, as a technical matter, consider the gasoline fuel properties of the RFG that would likely be sold in the area with and without an oxygen content waiver. From this information, one must then evaluate the impact that a change in fuel properties would produce on emissions of pollutants. The expected change in emissions of pollutants associated with those different RFG blends is needed to evaluate the impact of a waiver on attainment of a NAAQS. All relevant categories of emissions need to be considered.

EPA cannot make a determination of interference with or prevention of attainment of any NAAQS due to compliance with the oxygen content requirement unless the projected emissions impacts of a waiver are analyzed for each applicable NAAQS. Absent such an analysis, EPA is not able to determine whether a waiver would aid, hinder, or have no effect on attainment of a NAAQS.

## **B. New York's waiver request**

In a letter dated January 6, 2003 from New York State Department of Environmental Conservation (DEC) Commissioner Erin Crotty to then Administrator Whitman, New York officially requested a waiver under CAA Section 211(k)(2)(B) from the federal RFG oxygen content requirement for the New York RFG area.<sup>4</sup> The submission stated that because MTBE would be banned in the State of New York beginning January 1, 2004, and because of the Act's oxygen content requirement for RFG, ethanol would be used as an oxygenate in the RFG areas in New York State.

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<sup>2</sup> Docket A-2000-10, III-A-1.

<sup>3</sup> For further discussion of EPA's interpretation of the authority to grant a waiver under section 211(k)(2)(B), see Appendix A of Docket A-2000-10, II-B-1.

<sup>4</sup> Docket OAR-2003-0004, II.D.1.

DEC asserted that the use of ethanol as a replacement for MTBE in RFG would result in an increase in Volatile Organic Compounds (VOCs), and oxides of nitrogen (NOx) during the summer ozone season. DEC further argued that “increases in these pollutants will immediately interfere with New York’s ability to demonstrate reasonable progress to attain and maintain the federal ozone standard...”

EPA determined that DEC’s submission did not contain sufficient information and failed to address the requirements specified in the statute. EPA notified NY that technical and supporting information was needed for EPA to evaluate the merits of the request. In a letter to DEC dated April 1, 2003, EPA requested clarification and additional information.<sup>5</sup>

A subsequent submission dated December 12, 2003 from DEC acknowledged EPA’s April 1, 2003 request for additional information.<sup>6</sup> DEC provided some additional information in support of its waiver request with this correspondence, but generally did not provide the information requested by EPA, for reasons set forth in its letter.<sup>7</sup>

## **II. EPA’S ANALYSIS OF THE INFORMATION THAT NEW YORK DEC SUBMITTED**

### **A. Basis for DEC’s request for a waiver**

DEC’s request for a waiver is based primarily on its contention that use of ethanol-oxygenated reformulated gasoline will interfere with attainment of the ozone NAAQS because:

- The NOx and VOC emissions performance of ethanol-oxygenated RFG will be worse than the emissions performance of the MTBE-oxygenated RFG supplied to New York prior to its MTBE ban.
- Commingling and permeation resulting from ethanol use will increase VOC emissions compared to MTBE-oxygenated RFG.

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<sup>5</sup> Docket OAR-2003-0004, Document II.C.1.

<sup>6</sup> Docket OAR-2003-0004, Document II.D.6.

<sup>7</sup> DEC’s stated reasons for not providing the information requested by EPA, and EPA’s responses to those statements (that are not otherwise addressed in the TSD), are set forth in Appendix B to the Technical Support Document.

- Ethanol-oxygenated RFG will not provide the NOx reduction benefits expected under the RFG program because the Complex Model does not fully capture the effects of oxygenates on vehicle emissions of NOx.
- Relaxation of the RFG VOC performance standard for 10 percent ethanol blends, or granting of a 1 psi volatility waiver for 10 percent ethanol blends could increase VOC emissions.
- The transport of ethanol into the New York area would cause an increase in emissions due to additional ships and barges transporting ethanol into the New York area for adding to RFG at terminals.

## **B. Major limitations in the information submitted by DEC**

As discussed above, a key threshold technical issue in evaluating a waiver request is to evaluate the emissions impact of a waiver. The emissions impact of a waiver is basically a comparison of emissions with a waiver (“waiver”) to emissions without a waiver (“no waiver”). This comparison is needed to clearly demonstrate whether a waiver would aid, hinder, or have no effect on attainment of a NAAQS.

Certain information is required in order to make a quantitative estimate, or even a reasonably certain qualitative directional estimate, of the emissions changes that a waiver might produce. This information includes knowledge of certain emission-related properties of the reformulated gasoline that would be supplied to New York with and without a waiver. Models relating these fuel properties to vehicle emissions would then be used to estimate percent differences in emissions between the “no waiver” and “waiver” conditions. Additionally, on-road and off-road gasoline emission inventory data are needed in order to convert relative (%) changes to absolute (tons/day) changes. Inventory information may be necessary even to perform a directional analysis. The need for this information is described in detail in the accompanying Technical Support Document.

New York’s submissions included almost no information or analysis of the expected fuel properties of RFG with and without a waiver. New York did not provide sufficient information or analysis to show either quantitative or directional estimates of the emissions differences between “no waiver” and a “waiver” for the pollutants contributing to ozone formation, NOx, VOCs and CO. Each of these three pollutants affect ozone to a varying degree, and their emissions rates could be altered by a waiver. While New York’s submissions did contain quantitative estimates of certain VOC emission changes that could be associated with ethanol use compared to MTBE use, these estimates were of little use even to estimate the net directional change that a waiver would produce in VOC emissions, for several reasons which are discussed in

the TSD.<sup>8</sup> Changes in NO<sub>x</sub> emissions were not quantified, and the lack of adequate information and analysis means that even the direction of any change in NO<sub>x</sub> is not clear. Changes in CO emissions were not addressed.

If New York had provided information and analysis on the change in fuel properties and associated emissions that a waiver would be expected to produce, and the resulting impact on ozone, EPA would be in a position to thoroughly review the basis for these estimates (fuel property estimation and emission modeling methodology), and evaluate the estimated impact a waiver might have on ambient ozone.

DEC's original waiver submission did not provide quantitative estimates of the "no waiver" to "waiver" emission changes, as well as the underlying information necessary to make such estimates. Consequently, EPA asked for additional information and analyses to estimate 1) the effect a waiver would have on the properties of New York reformulated gasoline, and 2) the effect these changes in fuel properties would have on emissions from highway and off-road vehicles and equipment. DEC has not provided the requested information.

EPA has considered the information that New York has provided which may be relevant to an analysis of New York's waiver request. EPA has determined as described in the Technical Support Document, that the relevant no-waiver to waiver comparison cannot be made either qualitatively or quantitatively. In making this evaluation, EPA has considered the information provided by New York with regard to the potential effect of a waiver on each of the pollutants, NO<sub>x</sub>, VOC and CO, for both on-road and off-road gasoline vehicles and engines.

In order to evaluate the adequacy of the information submitted by New York, we have identified the information on fuel properties, vehicle fleets (e.g., on-road versus off-road, older technology vehicles versus newer technology, etc.), and emission sources (e.g., exhaust, "as blended" evaporative, commingling and permeation-related) that would need to be provided to conduct an adequate waiver/no-waiver analysis. We have also identified emissions models and other information necessary to make the relevant emission estimates that could be utilized to make a waiver/no-waiver comparison.

Based on the available information, EPA has concluded that neither the magnitude nor even the direction of the NO<sub>x</sub> and VOC changes that would occur with a waiver can be determined using the information provided. Although a gross directional

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<sup>8</sup> For example, certain other potential VOC emissions changes which could occur were not quantified, and New York included estimates of VOC emission increases based on unsupported assumptions about increases in gasoline Reid Vapor Pressure (RVP).

determination for carbon monoxide (CO) emissions can be made, the change in CO likewise cannot be quantified with the information provided by DEC.<sup>9</sup>

### III. CONCLUSION

The information that DEC has provided fails to demonstrate what effect a waiver would have on ozone levels in New York. This is because: 1) there are three pollutants whose emission rates could be altered by a waiver (NO<sub>x</sub>, CO and VOC) and all three affect ozone formation to varying degrees; 2) the lack of information on fuel qualities with and without a waiver and the lack of other relevant and necessary information precludes even a directional estimate of the impact of a waiver on NO<sub>x</sub> and VOC emissions; 3) the best estimate of the net impact of a waiver on CO emissions is that CO emissions would be greater with a waiver than without, but the difference cannot be quantified; and 4) no analysis has been provided or performed, and the information before the agency does not allow an analysis to be performed, on the combined effect of these emissions changes on ozone.

Since no determination can be made regarding the overall effect of a waiver on ozone-related emissions, the information that DEC has provided fails to clearly demonstrate what effect a waiver would have on ozone. Since this threshold demonstration has not been made, EPA is not able to determine whether a waiver would aid, hinder, or have no effect on attainment of the ozone NAAQS, and therefore cannot determine whether compliance with the oxygen requirement for RFG prevents or interferes with attainment of the ozone NAAQS in the New York RFG area. EPA concludes that New York's request therefore should be denied.<sup>10</sup>

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<sup>9</sup> CO plays a far less important role in ozone formation than NO<sub>x</sub> or VOC. Thus, even though a gross directional determination can be made, such a determination provides little useful information in making a judgement about the net impact on ozone formation from a waiver.

<sup>10</sup> New York has not raised any issue concerning interference with attainment of the particulate matter (PM) NAAQS. However, our conclusions regarding the PM NAAQS would be the same as those regarding the ozone NAAQS, i.e., New York has provided insufficient information to clearly demonstrate what effect, if any, a waiver would have on PM. This is because New York has not provided sufficient information to determine PM-related emissions for the no waiver and waiver comparison.