

## TITLE 13. CALIFORNIA AIR RESOURCES BOARD

### NOTICE OF PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE CALIFORNIA REFORMULATED GASOLINE REGULATIONS, INCLUDING A DECEMBER 31, 2002 PROHIBITION OF USING MTBE IN GASOLINE, ADOPTION OF PHASE 3 GASOLINE STANDARDS, A PHASE 3 PREDICTIVE MODEL, AND OTHER CHANGES

The Air Resources Board (ARB or Board) will conduct a public hearing at the time and place noted below to consider amendments to the California Reformulated Gasoline (CaRFG) Regulations. The proposed amendments would prohibit California gasoline that is produced with the use of methyl tertiary-butyl ether (MTBE) starting December 31, 2002, adopt CaRFG Phase 3 standards, establish a CaRFG Phase 3 Predictive Model that includes an evaporative emissions element, and make various other changes.

Date: December 9, 1999

Time: 9:30 a.m.

Place: Board Hearing Room, Lower Level  
2020 L Street  
Sacramento, California 95814

This item will be considered at a two-day meeting of the Board, which will commence at 9:30 a.m. on December 9, 1999, and may continue at 8:30 a.m. on December 10, 1999. This item may not be considered until December 10, 1999. Please consult the agenda for the meeting, which will be available at least 10 days before December 9, 1999, to determine the day on which this item will be considered.

This facility is accessible to persons with disabilities. If accommodation is needed, please contact ARB's Clerk of the Board at (916) 322-5594, or TDD (916) 324-9531, or (800) 700-8326 for TDD calls for outside the Sacramento area at least 7 days before the hearing.

### INFORMATIVE DIGEST OF PROPOSED ACTION/PLAIN ENGLISH POLICY STATEMENT OVERVIEW

#### **Proposed Actions and Sections Affected**

Proposed amendments to sections 2260, 2261, 2262.1, 2262.5, 2263, 2264, 2264.2, 2265, 2266, 2266.5, 2269, 2270 and 2271, repeal of sections 2262.2, 2262.3, 2262.4, 2262.6, 2262.7 and 2264.4, and adoption of sections 2262, 2262.3, 2262.6, 2262.9, of Title 13, California Code of Regulations (CCR). Adoption of the "California Procedures for Evaluating Alternative

Specifications for Phase 3 Reformulated Gasoline Using the California Predictive Model,” incorporated by reference in section 2265(a)(2), title 13, California Code of Regulations.

## **Background**

**The existing CaRFG regulations.** The CaRFG Phase 2 (CaRFG2) regulations were adopted by the Board following a hearing in November 1991 and became applicable in the spring of 1996. The regulations established a comprehensive set of standards for gasoline designed to achieve the maximum feasible reductions in emissions of criteria pollutants and toxic air contaminants from gasoline-powered motor vehicles. The standards cover sulfur, benzene, olefin, oxygen, and aromatic hydrocarbon contents, the 50-percent and 90-percent distillation temperatures (T50 and T90), and summertime Reid vapor pressure (RVP). The table in the next part of this notice shows the current CaRFG Phase 2 standards and compares them to the CaRFG Phase 3 standards being proposed in this rulemaking.

The primary element of the CaRFG Phase 2 standards is a set of limits that apply to gasoline when it is first supplied from the production facility (typically a refinery) or import facility. These will be referred to as the “refiner” limits. The CaRFG Phase 2 standards also include a set of “cap limits” that apply throughout the gasoline distribution system and for all properties but RVP are less stringent than the refiner limits. This approach allows the imposition of very stringent standards at the refinery while allowing refiners to vary the composition of individual batches in a cost effective way up to the cap limits as long as overall equivalent emissions performance is achieved. The cap limits allow for effective enforcement for gasoline in transit to, and being sold at, service stations and other fueling facilities.

With the exception of RVP and oxygen content, the regulations provide three compliance options for meeting the refiner limits. One option is to have the gasoline subject to either a “flat limit,” set forth in the regulations which must be met by every gallon of gasoline leaving the refinery, or a specified “averaging limit.” The averaging limits for each of the six properties are numerically more stringent than the comparable flat limits. Under the averaging option, the producer may assign differing “designated alternative limits” (DALs) to different batches of gasoline being supplied from the refinery. Each batch of gasoline must meet the DAL for the batch. A producer or importer supplying a batch of gasoline with a DAL above the averaging limit must, within 90 days before or after, supply sufficient quantities of gasoline subject to more stringent DALs to fully offset the excess over the averaging limit.

The CaRFG regulations also contain a second compliance mechanism under which a refiner may use the “CaRFG Phase 2 Predictive Model” to identify alternative flat and averaging limits applicable when gasoline is supplied from the refinery. The Predictive Model consists of mathematical equations which predict the changes in exhaust emissions of hydrocarbons, oxides of nitrogen (NOx), and potency weighted toxics for four toxic air contaminants that result from different gasoline formulations. The four toxic air contaminants are benzene, 1,3-butadiene, acetaldehyde, and formaldehyde. The Predictive Model is based on data from 18 vehicle emission test programs analyzing the relationship of gasoline properties and emissions. An alternative

gasoline formulation is acceptable if there will be essentially no increase in emissions of hydrocarbons, NO<sub>x</sub>, and potency-weighted toxics under the Predictive Model. Currently, most of the gasoline sold in California complies with the CaRFG2 regulations through the use of the Predictive Model.

The third compliance option provided by the CaRFG regulations allow for certification of alternative gasoline formulations based on the results of vehicle emission testing. Under this option, producers must perform a comparative vehicle emissions test program to show that their gasoline formulation achieves equivalent emissions as compared to a CaRFG2 reference test fuel.

Gasoline oxygen content is regulated somewhat differently from the other properties in that there are both minimum and maximum oxygen content standards. Oxygen is added to gasoline by blending in an "oxygenate." The oxygenate most used by far in California has been MTBE. Much smaller amounts of ethanol have been used. While the CaRFG2 oxygen standard is 1.8 to 2.2 percent by weight, producers and importers may use the Predictive Model to vary the applicable limit. The oxygen content may be as low as zero percent or as high as 3.5 wt. percent when the Predictive Model is used. Since adding oxygen to gasoline will reduce emissions of carbon monoxide (CO) from most vehicles now on the road, the CaRFG regulations originally required a minimum oxygen content of 1.8 wt. percent statewide in the winter months when CO concentrations are the highest. Last year, the ARB eliminated the wintertime minimum oxygen requirement in those areas where the requirement was not necessary to meet the national and state ambient CO standards. After this winter, the wintertime 1.8 wt. percent minimum oxygen requirement will apply only in Los Angeles, Orange, Ventura, San Bernardino, Riverside and Imperial Counties. The state is conditionally mandated by section 211(m) of the federal Clean Air Act (FCAA) to maintain a wintertime oxygen requirement in all of these counties except Imperial.

**Comparable Federal Regulations.** Pursuant to the 1990 amendments to the FCAA, the U. S. Environmental Protection Agency (U.S. EPA) has adopted federal RFG regulations that apply in San Diego County, the greater Los Angeles area (Los Angeles, Orange and Ventura counties, and parts of Riverside and San Bernardino counties), and the greater Sacramento area (Sacramento county and parts of Yolo, Solano, Sutter, Placer, and El Dorado counties). Together, these areas make up about 70 percent of the state's gasoline market. Both the federal and state RFG regulations apply in those areas. To avoid unnecessary duplication of the enforcement requirements, in 40 C.F.R. §80.81, the U.S. EPA exempted California producers from many of the federal enforcement requirements until January 1, 2000 when federal "Phase II" requirements apply; this was recently extended indefinitely (64 F.R. 49992 (September 15, 1999)). The oxygen requirements in the federal RFG and CaRFG programs differ considerably. The FCAA requires a minimum 2.0 wt. percent oxygen requirement year-round, even when it is not needed to avoid exceedances of the ambient CO standards and formulations with less or no oxygen will achieve equivalent reductions in emissions of hydrocarbons and toxics. Thus because of federal law, California refiners must comply with the federal minimum oxygenate requirement in 70 percent of California's gasoline. For the remaining 30 percent of the state's gasoline, refiners have the flexibility to produce gasoline without oxygen if they choose, as long as minimum emissions

performance required by the CaRFG regulations are met. Using this flexibility, California refiners have been providing substantial quantities of oxygen-free gasoline where permitted in Northern California with no loss in emission benefits.

**Recent Developments.** During the initial implementation of the federal RFG regulations in 1995, concerns were raised regarding exposure to MTBE during vehicle fueling and associated potential adverse health effects. These concerns were initially raised in other states. In addition, concerns were raised regarding the detection of MTBE in surface and ground water, including a number of drinking water supplies in California and other states. Legislation enacted in 1997 required the University of California (U.C.) to conduct a study of the health and other environmental risks and benefits of MTBE in gasoline compared to other oxygenates. This same legislation also required the Governor to take appropriate action based on the findings and information from public hearings conducted on the U.C. Report. The U.C. Report was released in late 1998, and concluded that there were significant risks to the environment, as well as costs associated with water contamination due to the use of MTBE. This was because MTBE is highly soluble in water and will transfer more readily than most other gasoline components to groundwater from gasoline leaking from underground storage tanks, pipelines and other parts of the gasoline distribution system. MTBE was also shown to pose an odor and taste problem in water at very low concentrations.

As a result, on March 25, 1999, Governor Davis signed Executive Order D-5-99, in which he found that, on balance, there is a significant risk to the environment from using MTBE in gasoline in California. Governor Davis directed the California Energy Commission (CEC) to issue a timetable for the removal of MTBE from gasoline at the earliest possible date but not later than December 31, 2002. The CEC subsequently determined that December 31, 2002 was in fact the earliest feasible time. The Executive Order also directed the ARB by December 1999 to adopt CaRFG Phase 3 regulations that will provide additional flexibility in lowering or removing the oxygen content requirement while maintaining current emissions and air quality benefits and ensuring compliance with the State Implementation Plan (SIP).

Senate Bill 989 (Sher) was signed by the Governor on October 10, 1999. It enacts a law requiring, in part, that the CEC develop a timetable for the removal of MTBE from gasoline at the earliest possible date, and requiring the ARB to ensure that the CaRFG Phase 3 regulations maintain or improve upon emissions and air quality benefits achieved by CaRFG Phase 2 as of January 1, 1999 and to provide additional flexibility to reduce or remove oxygen from motor vehicle fuel. Senate Bill 529 (Bowen), also signed by the Governor on October 10, establishes a mechanism for conducting environmental assessments of revisions to the ARB's CaRFG standards proposed before January 1, 2000, and the mechanism will be used in connection with this rulemaking.

Removal of MTBE from California gasoline would be considerably easier and less expensive if federal law did not mandate that it be replaced by another oxygenate in 70 percent of the state's gasoline. In April, Governor Davis asked the U.S. EPA to issue a waiver of the oxygenate requirement under a waiver provision in the federal law, and legislation has been introduced in the

House and Senate to allow the CaRFG program to substitute for the federal RFG program in the state as long as it achieves equivalent or greater reductions in ozone-forming compounds and toxic air contaminants.

### **Proposed Amendments**

The staff is proposing amendments to the CaRFG regulations consistent with the Governor's Executive Order D-5-99, SB 989, and the timetable for removing MTBE approved by the CEC. In developing these amendments, staff held eight public workshops since February 1999 and had numerous meetings and discussions with a variety of interested parties.

**Prohibition on MTBE in California gasoline produced after December 31, 2002.** Staff is proposing a ban on production of California gasoline produced with the use of MTBE, which would apply to all gasoline supplied from production and import facilities starting December 31, 2002. This is consistent with the Governor's Executive Order D-5-99 and the schedule approved by the CEC. The prohibition on production of gasoline with MTBE would quickly result in its phase-out throughout the storage and marketing system. For enforcement purposes, the prohibition will apply 45 days later to all downstream facilities except bulk plants, retail outlets, and bulk purchaser-consumer facilities. After another 45 days, the ban on dispensing of California gasoline produced with the use of MTBE will apply throughout the distribution system. This phase-in is similar to the same schedule used in the phase-in of CaRFG Phase 2 in 1996, and is necessary to avoid disruptions in the gasoline distribution system.

Along with the prohibition on the use of MTBE in gasoline, staff proposes a three-phase reduction of limits on the small residual levels of MTBE in produced and imported California gasoline. As the ban on the dispensing of MTBE in gasoline is implemented, it is expected that very low levels of MTBE may continue to exist in parts of the gasoline distribution system. During the first year, starting December 31, 2002, there would be prohibition of gasoline containing 0.3 volume percent or more MTBE. This limit would have the same 90-day phase-in period for downstream facilities as the prohibition of gasoline made with the use of MTBE. Starting in December 31, 2003, California gasoline would be prohibited from containing 0.15 volume percent or more MTBE, and a permanent prohibition of 0.05 percent or more MTBE would apply starting December 31, 2004. A 90-day downstream phase in period would apply for each change in allowable MTBE.

In recognition that other ethers (such as ethyl tertiary-butyl ether and tertiary-amyl methyl ether) have similar characteristics as MTBE and could likely pose similar risks to the environment if used in significant volume, the staff proposes to require a comprehensive evaluation prior to the use of these ethers, as well as alcohols other than ethanol, as replacements for MTBE. Under this requirement, any non-MTBE ether, or alcohol other than ethanol, must undergo a multimedia evaluation regarding the use of the ether or alcohol. Furthermore, the California Environmental Policy Council, which was established by Public Resources Code section 71017, would also have to determine that the ether or alcohol will not cause a significant adverse impact on the public health or the environment before its use would be allowed in California gasoline.

**The CaRFG Phase 3 standards.** In addition to the required phase-out of MTBE use, staff is also proposing a number of changes to the current specifications for CaRFG Phase 2 gasoline. Collectively, these are referred to as the CaRFG3 standards. Table 1 shows the current CaRFG Phase 2 standards and the proposed CaRFG3 standards, which would become applicable starting December 31, 2002, with a 90-day phase in period downstream of production and import facilities. It is important to note that ARB staff expects that refiners will generally continue to use

**Table 1**

| <i>Property</i>  | <i>Flat Limits</i>   |                         | <i>Averaging Limits</i> |                      | <i>Cap Limits</i>      |                        |
|--|----------------------|-------------------------|-------------------------|----------------------|------------------------|------------------------|
|  | <i>CaRFG Phase 2</i> | <i>CaRFG Phase 3</i>    | <i>CaRFG Phase 2</i>    | <i>CaRFG Phase 3</i> | <i>CaRFG Phase 2</i>   | <i>CaRFG Phase 3</i>   |
| Reid Vapor Pressure (pounds per square inch; warmer months only) | 7.00                 | 7.00 or 6.90 w/ evap PM | Not Available           | Not Available        | 7.00                   | 6.40 – 7.20            |
| Sulfur Content (parts per million by weight)                     | 40                   | 20                      | 30                      | 15                   | 80                     | 60                     |
|  |                      |                         |                         |                      |                        | 30 (12/31/04)          |
| Benzene Content (percent by volume)                              | 1.0                  | 0.8                     | 0.8                     | 0.7                  | 1.2                    | 1.1                    |
| Aromatics Content (percent by volume)                            | 25.0                 | 25.0                    | 22.0                    | 22.0                 | 30.0                   | 35.0                   |
| Olefins Content (percent by volume)                              | 6.0                  | 6.0                     | 4.0                     | 4.0                  | 10.0                   | 10.0                   |
| T50 (degrees Fahrenheit)   | 210                  | 211                     | 200                     | 201                  | 220                    | 225                    |
| T90 (degrees Fahrenheit)   | 300                  | 305                     | 290 (max. 310)          | 295                  | 330                    | 335                    |
| Oxygen Content (percent by weight)                               | 1.8 - 2.2            | 1.8 - 2.2               | Not Available           | Not Available        | 1.8 - 3.5 winter areas | 1.8 - 3.7 winter areas |
|  |                      |                         |                         |                      | 0 - 3.5                | 0 – 3.7                |
| Driveability Index (DI)  | None                 | 1225                    | Not Available           | Not Available        | None                   | None                   |

the Predictive Model in producing California gasoline. Thus for any particular batch of gasoline the refiner will vary the limits for the regulated properties from those in the table, as long as the Predictive Model shows that the alternative limits applicable to the batch will not increase emissions of hydrocarbons, NOx, and potency-weighted toxics compared to the limits in the regulations.

Using the proposed CaRFG Phase 3 Predictive Model described below, staff has compared the emissions performance of fuels expected to be produced meeting the proposed CaRFG Phase 3 limits with the average fuel produced in 1998 (in compliance with the current CaRFG Phase 2 standards). This analysis shows that the proposed CaRFG standards are expected to achieve in 2005 additional emission reductions from motor vehicles of 0.1 percent for hydrocarbons, 2.2 percent for NO<sub>x</sub>, and 7 percent for potency-weighted toxics. These reductions translate to statewide ozone precursor emission reductions in 2005 of 0.5 tons per day hydrocarbons and 20 tons per day NO<sub>x</sub>. Thus, the proposed amendments preserve and enhance the benefits of the current CaRFG Phase 2 gasoline program and ensure compliance with the State Implementation Plan.

The proposed specifications are intended to strike a balance between providing as much flexibility as possible in producing complying gasoline without MTBE, preserving and obtaining additional cost-effective emissions benefits, and minimizing the loss in supply from in-state gasoline production due to the removal of MTBE. For example, the staff is proposing increases in the flat, average and cap limits for T50 and T90 to increase refiner flexibility. The proposed reductions in the sulfur and benzene limits are designed to preserve existing benefits and gain additional NO<sub>x</sub> and toxic emissions reductions. The increases in T50 and T90 are to increase flexibility and allow higher production volumes.

A specification is being proposed for driveability index (DI) to preserve vehicle driveability and to ensure that compliance with the Low Emission Vehicle (LEV) II standards is not hampered by the cap limit increases proposed for T50 and T90. High DI limits are associated with emission increases.

**The CaRFG Phase 3 Predictive Model.** Staff proposes that a new CaRFG Phase 3 Predictive Model be applicable along with the CaRFG Phase 3 standards. The revised model is based on the existing Predictive Model with three basic changes. First, the proposal would add an evaporative hydrocarbon emissions element that would allow refiners to vary RVP and use the hydrocarbon impacts in conjunction with the exhaust emissions Predictive Model. This would facilitate ethanol usage by permitting refiners that use ethanol to produce a fuel with higher RVP provided that the increase in evaporative emissions were offset by reductions in exhaust emissions. It would also allow refiners to use lower RVP gasolines as part of their compliance demonstration under the Predictive Model. When using the evaporative model, the RVP flat limit would be 6.9 psi.

A second change in the Predictive Model allows a hydrocarbon credit for gasoline that provides CO emissions reductions associated with an oxygen content greater than 2.0 wt. percent. The credit reflects the fact that CO contributes to ozone formation, and would be based on the relative reactivity of CO compared to the various hydrocarbon species. Also, when less than 2.0 wt. percent oxygen is used, a CO debit would apply. Again, this credit will facilitate the use of ethanol in California gasoline.

Third, the Predictive Model has been updated to reflect recent vehicle test data and changes in the current vehicle fleet and to account for changes in newer vehicles' response to changes in fuel properties.

**Other changes pertaining to the use of oxygenates in California gasoline.** Certain characteristics of gasoline blends containing ethanol make them infeasible to be transported through pipeline systems. Because of this, ethanol is typically added to gasoline at the terminal or in the delivery truck. The CaRFG regulations allow a refiner to ship non-oxygenated gasoline from the refinery without complying with the RFG standards if it is specially formulated to be combined with oxygenate "downstream" from the refinery and the resulting blend will meet all of the CaRFG standards. This allows entities adding oxygen downstream from the refinery to take advantage of the contribution the oxygenate can make to complying with the CaRFG, particularly by diluting the concentration of compounds like sulfur. The nonoxygenated blend is called "California reformulated gasoline blendstock for oxygenate blending," or "CARBOB". The staff is proposing a number of changes to the CARBOB provisions, which in most cases will make it easier for refiners and oxygenate blenders to comply. These changes include elimination of quality audit requirements, elimination of a "representativeness" requirement for sampling at the refinery, adding standards for denatured alcohol intended for blending in gasoline, allowing up to 3.7 wt. percent oxygen if ethanol does not exceed 10 vol. percent, and facilitating use of the Predictive Model for gasoline containing 2.7 or 3.7 wt. percent oxygen from ethanol.

**Additional information expected prior to the Board hearing.** Staff is expecting additional information to become available prior to the December Board hearing. The ARB EMFAC7G Emissions Inventory used by staff to calculate emissions from the amendments is being modified and a new inventory model will be presented to the Board for consideration for modification in November of 1999. Staff is currently reviewing the inventory updates and will review any modifications made at the November hearing. The new inventory may change the basis for staff's emissions calculations.

Testing of the effects of sulfur and oxygen content in fuels on new vehicle emission control technology is underway and the results from these tests may result in small corrections to the Predictive Model proposed changes. Staff are also continuing to evaluate the effects of mixing non-oxygenated RFG and RFG oxygenated with ethanol in vehicle fuel tanks. In addition, the ARB and the State Water Resources Control Board are currently evaluating the environmental fate and transport analysis of ethanol in air, surface water, and groundwater. This information will also likely be available by the Board hearing. The Office of Environmental Health Hazard Assessment is also evaluating the potential public health impacts and groundwater contamination of ethanol as a replacement for MTBE. Staff will evaluate such information, and if changes are warranted to the staff proposal, then such changes will be presented to the Board at the hearing.

**Environmental impacts.** The proposed changes will result in less risk to water quality by removing MTBE from beginning December 31, 2002. Existing MTBE contamination would continue until natural effects or remedial efforts would reduce it. To the extent ethanol would replace MTBE, ethanol could contribute to further water contamination. Also, the use of

alkylates, branched chain alkane hydrocarbons, in gasoline are expected to increase and more alkylates could also get into water from the use of gasoline. However, ethanol and alkylates are biodegradable and water issues are less likely than with MTBE. The other proposed changes should not change the risk to water quality. Finally, the reduction in benzene should further limit the amount of benzene, a known human carcinogen, in CaRFG and reduce the risk to water.

The air quality impacts of the proposed amendments should be positive. Reductions in ozone and particulate matter precursor emissions will directionally reduce ozone levels and ambient particulate matter levels. Reduction in benzene will result in reduced ambient levels of benzene. With elimination of MTBE ambient MTBE levels and public exposure will also decrease.

To the extent that non-oxygenated gasoline and gasoline oxygenated with ethanol are commingled in vehicle tanks, evaporative emissions of hydrocarbons could increase. Initial evaluations of this effect are complex, and are continuing. The initial assessments suggest that the expected emissions effect is minor; however, any different results from the ongoing assessments will be discussed at the Board meeting.

Finally, global warming emissions are expected to be neutral. However, if the production of biomass ethanol increases in California, there could be reductions in global warming emissions.

## **AVAILABILITY OF DOCUMENTS AND CONTACT PERSON**

The Board staff has prepared a Staff Report which includes the Initial Statement of Reasons for the proposed action and a summary of the environmental and economic impacts of the proposal, if any. Copies of the Staff Report and the full text of the proposed regulatory language may be obtained from the Public Information Office, Air Resources Board, 2020 L Street, Sacramento, California 95814, (916) 322-2990. To obtain this document in an alternative format, please contact the Air Resources Board's ADA Coordinator at (916) 322-4505, TDD (916) 624-9531, or (800) 700-8326 for TDD calls from outside the Sacramento area.

This notice, the staff report, and all subsequent regulatory documents are being made available on the ARB Internet site for this rulemaking, <http://www.arb.ca.gov/regact/carfg3/carfg3.htm>.

The Board staff has compiled a record which includes all information upon which the proposal is based. This material is available for inspection upon request to the contact person identified immediately below. The ARB has determined that it is not feasible to draft the regulation amendments in plain English due to the technical nature of the regulation; however, a plain English summary of the proposed regulation is available from the agency contact person named in this notice, and is also contained in the Staff Report for this regulatory action.

Further inquiries regarding this matter should be directed to Mr. Dean C. Simeroth, Chief, Criteria Pollutants Branch, Stationary Source Division, at (916) 322-6020.

## **COSTS TO PUBLIC AGENCIES AND TO BUSINESSES AND PERSONS AFFECTED**

The determinations of the Board's Executive Officer concerning the costs or savings necessarily incurred in reasonable compliance with the proposed regulatory action are presented below.

The Executive Officer has determined that the proposed regulatory action will not create costs or savings, as defined in Government Code section 11346.5(a)(6), to any state agency or in federal funding to the state, costs or mandate to any local agency or school district whether or not reimbursable by the state pursuant to Part 7 (commencing with section 17500, Division 4, Title 2) of the Government Code, or other non-discretionary savings to local agencies.

In preparing the regulatory proposal, the staff has considered the potential economic impacts on California business enterprises and individuals. Demand for gasoline has been steadily increasing at about 1.5 percent per year and is expected to continue increasing into the foreseeable future. Therefore, gasoline importation will increase in the future to meet the rising gasoline demand in the state. A combination of substantial capital modifications and an increased level of imports (either blendstocks or finished gasoline) will be needed to ensure that California refineries maintain close-to-current production levels when MTBE is prohibited. The necessary refinery changes are greater in refineries that must add ethanol in lieu of the MTBE, either to provide sufficient octane or to meet federal mandates requiring oxygen year-round in federal RFG areas of the state. Also, existing more complex refineries will be at a greater advantage to increase their flexibility than less complex refineries. Based on discussions with California refiners, the CEC and others, staff estimates the necessary capital improvement costs to comply with the proposed amendments are approximately \$1 billion, with the annualized after-tax cost over ten years being approximately \$360 million per year. This is equivalent to about 4.1 cents per gallon on a before-tax basis and about 2.4 cents per gallon after taxes. Of this cost, about 90 percent are associated with the removal of MTBE alone, and the remaining cost is associated with the additional sulfur removal.

The capital improvement costs do not include the cost of importing whatever gasoline or blending materials would be necessary to supplement California production to the level needed to satisfy demand. Staff estimates that after the implementation of the proposed amendments to phase-out MTBE use, the state's refinery capacity for producing complying gasoline will be 85 to 90 percent of current levels. In addition, by replacing MTBE with ethanol, half as much ethanol is needed to provide the same oxygen content as MTBE; this decrease in volume would also necessitate additional imports. Costs associated with this would be approximately 10 cents per gallon of hydrocarbon blendstock imported (based on transportation costs), translating into approximately 1.5 to 2 cents per gallon of gasoline. This increase applies to all gasoline. In addition to importing more hydrocarbon blendstocks after MTBE is banned, it will be necessary to import ethanol from the Midwest to meet the winter oxygen requirements in the South Coast, the federal oxygen requirements (if they remain), and octane needs (The need for imports of ethanol will decrease with time to the extent that biomass-to-ethanol facilities are constructed within California). Costs associated with the use of ethanol as a gasoline blendstock are lower than

MTBE for each gallon of gasoline because approximately half as much ethanol is needed to provide the same oxygen content as MTBE, so transportation costs will be lower. Apart from these costs, capital expenditures of approximately \$60 million will be needed at pipeline terminals and ethanol off-loading sites for the handling and storage of ethanol and ethanol-blended gasoline.

In determining the overall cost estimate of the proposed amendments, staff estimates first year costs to be 4 to 7 cents per gallon. However, after the first year, stability in the importation, price and production of gasoline components, as well as optimization of new equipment installed by refiners, should result in lower costs. Staff estimates that costs during the second year and beyond will be 2 to 6 cents per gallon, averaging about 4 to 5 cents per gallon. In addition, elimination of the federal 2.0 percent minimum oxygen requirement in Sacramento and Southern California would be expected to significantly reduce the costs of removing MTBE, especially for those refiners with existing capability to produce complying fuel without the addition of oxygen. Most of these costs are attributable to the elimination of MTBE. The proposed amendments that will enhance compliance flexibility — higher cap limits, evaporative emissions model and increased T50 and T90 limits — should reduce the net cost of meeting the MTBE phase-out, but will not produce savings relative to the production costs of the current fuel, which allows MTBE use. While refiners may spend money in response to the proposed CaRFG Phase 3 changes, those expenditures should on the whole be remunerative in that they should moderate the basic costs of meeting the MTBE phase-out.

On the basis of these cost estimates, the Executive Officer finds that the adoption of the proposed amendments may have a significant adverse impact on some businesses. The Executive Officer has considered proposed amendments that would lessen any adverse economic impact on business and invites you to submit proposals. Submissions may include the following considerations:

- (i) The establishment of differing compliance or reporting requirements or timetables which take into account the resources available to businesses;
- (ii) Consolidation or simplification of compliance and reporting requirements for businesses;
- (iii) The use of performance standards rather than prescriptive standards;
- (iv) Exemption or partial exemption from the regulatory requirements for businesses.

In accordance with Government Code section 11346.3, the Executive Officer has determined that the proposed regulatory action should have minor, if any, impact on the creation or elimination of jobs within the State of California, the creation of new businesses or elimination of existing businesses within California, or the expansion of businesses currently doing business within California. An assessment of the economic impacts of the proposed regulatory action can be found in the Staff Report.

The Executive Officer has also determined, pursuant to Government Code section 11346.5(a)(3)(B), that the proposed regulatory action will affect small business.

Before taking action on the proposed regulatory action, the Board must determine that no alternative considered by the agency would be more effective in carrying out the purpose for which the action is proposed or would be as effective and less burdensome to affected private persons than the proposed action.

## **SUBMITTAL OF COMMENTS**

The public may present comments relating to this matter orally or in writing. To be considered by the Board, written submissions must be addressed to and received by the Clerk of the Board, Air Resources Board, Post Office Box 2815, Sacramento, California 95812, no later than 12:00 noon, December 8, 1999, or received by the Clerk of the Board at the hearing.

The Board requests but does not require that 20 copies of any written statement be submitted and that all written statements be filed at least 10 days prior to the hearing so that ARB staff and Board members have time to fully consider each comment. The Board encourages members of the public to bring to the attention of staff in advance of the hearing any suggestions for modification of the proposed regulatory action.

## **STATUTORY AUTHORITY AND HEARING PROCEDURES**

This regulatory action is proposed under that authority granted in sections 39600, 39601, 43013, 43013.1 (eff. 1/1/2000), 43018, 43101, and 43830, Health and Safety Code, and Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975). This regulatory action is proposed to implement, interpret, and make specific sections 39000, 39001, 39002, 39003, 39010, 39500, 39515, 39516, 41511, 43000, 43013, 43013.1 (eff. 1/1/2000), 43016, 43018, 43021, 43830, 43830.8 (eff. 1/12/2000) and 43101, Health and Safety Code, and Western Oil and Gas Ass'n. v. Orange County Air Pollution Control District, 14 Cal.3d 411, 121 Cal.Rptr. 249 (1975).

The public hearing will be conducted in accordance with the California Administrative Procedure Act, Title 2, Division 3, Part 1, Chapter 3.5 (commencing with section 11340) of the Government Code.

Following the public hearing, the Board may adopt the regulatory language as originally proposed, or with nonsubstantial or grammatical modifications. The Board may also adopt the proposed regulatory language with other modifications if the text as modified is sufficiently related to the originally proposed text that the public was adequately placed on notice that the regulatory language as modified could result from the proposed regulatory action; in such event the full regulatory text, with the modifications clearly indicated, will be made available to the public, for written comment, at least 15 days before it is adopted. Potential modifications include, but are not limited to changes to the CaRFG Phase 3 specifications, CaRFG Phase 3 Predictive

Model (including its use prior to December 31, 2002), CARBOB provisions, allowable residual MTBE levels, and if warranted, separate treatment of small refiners. The public may request a copy of the modified regulatory text from the Board's Public Information Office, 2020 L Street, Sacramento, California 95814, (916) 322-2990.

CALIFORNIA AIR RESOURCES BOARD

Michael P. Kenny  
Executive Officer

Date: October 12, 1999