California Environmental Protection Agency

# Air Resources Board

# Public Hearing to Consider an Emergency Regulatory Amendment Relaxing the Reid Vapor Pressure Standard for California Reformulated Gasoline in September and October 2005

## STAFF REPORT

**Release Date: September 6, 2005**

**State of California**
**California Environmental Protection Agency**
**AIR RESOURCES BOARD**
**Stationary Source Division**

**STAFF REPORT**

# Public Hearing to Consider an Emergency Regulatory Amendment Relaxing the Reid Vapor Pressure Standard for California Reformulated Gasoline in September and October 2005

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# I. INTRODUCTION AND SUMMARY

## A. Introduction

This staff report has been prepared to support staff's proposal for emergency amendments to the California Phase 3 reformulated gasoline regulations to relax the Reid vapor pressure (RVP) standards. This proposal is in response to the impact of Hurricane Katrina on the imports of gasoline and gasoline blending components to California.

The Air Resources Board (ARB) adopted its reformulated gasoline regulations in 1992. These regulations have significantly reduced the emissions of volatile organic compounds (VOC), oxides of nitrogen (NOx), and toxics from motor vehicles and other gasoline powered engines. To provide an adequate supply of California reformulated gasoline to California's consumers, the California refining industry regularly imports finished gasoline and blendstocks from around the world. Imports, either blendstocks or finished gasoline, constitute about 5 to 10 percent of the fuels supplied to California. These imports historically came from Europe, Canada, the Caribbean and the Gulf Coast of the United States (U.S.).

## B. Summary

On August 28, Hurricane Katrina made landfall on the south U.S. coast, causing massive damage and flooding to broad areas of Alabama, Louisiana, and Mississippi. As of September 2, nine major oil refineries remained closed in Louisiana and Mississippi and several others had reduced output. With about 2 million barrels per day (bpd) of refining capacity shut in or reduced due to Hurricane Katrina, approximately 1 million bpd of gasoline is not being produced. This represents about 10 percent of the nation's consumption, and is a major reduction in the production of gasoline.

In addition, major pipelines originating in the Gulf of Mexico area have been severely impacted. Initially they were closed. They have resumed operation but at a much reduced rate. As a result, the distribution of gasoline, particularly in the Gulf Coast, Midwest, and East Coast regions of the country, has been significantly impacted. Also, at least initially, imports from historical suppliers to California including the Gulf Coast are being diverted to the East Coast to help replace supplies lost due to the production and pipeline disruptions.

ARB staff in consultation with staff from the California Energy Commission (CEC) estimates that there will be a significant reduction in imports to California until the refineries on the Gulf Coast and pipelines originating there are back to normal production capacity and inventories have been replenished.

In response to the effects of Hurricane Katrina, on August 30, 2005, the United States Environmental Protection Agency (U.S. EPA) Administrator, Stephen L. Johnson, determined that the impact of Hurricane Katrina created an extreme and unusual fuel supply circumstance in the southern states most affected by the hurricane. The Administrator announced that U.S. EPA will temporarily allow all parties in the fuel distribution system, including refiners, importers, distributors, carriers and retail outlets to supply gasoline meeting a Reid Vapor Pressure (RVP) standard of 9.0 pounds per square inch (psi) in areas of the affected states where a lower RVP is required. On August 31, 2005, the U.S. EPA Administrator announced that the relief would be extended to all 50 states and U.S. territories.

The ARB staff is proposing an emergency regulatory amendment that would grant similar temporary relief to enable increased in-state gasoline production to make up for the lost imports from the Gulf Coast and other regions of the world. Staff is proposing that the limit for the RVP of gasoline sold in California be raised from the current 6.9 to 7.0 psi level to 9.0 psi for the rest of the 2005 RVP control season, which ends in most of the state on October 31 and September 30, 2005 in a few air basins in the state. This increase in allowable vapor pressure of gasoline would enable refiners to retain or add back higher volatility components into gasoline that would normally not be allowed until the wintertime non-RVP control season. This would result in an increase in gasoline production of almost 10 percent, which is approximately equal to the expected loss in imports.

ARB staff estimates that the increase in emission from on-road motor vehicles associated with this amendment could be as large as 50 tons per day (tpd) of VOCs. Emission increases would be limited to VOCs only with no expected increase in oxides of nitrogen or toxic air contaminants. Also, this increase in VOCs would occur when ozone levels are lower than the peak summer ozone season of June through August. The RVP control season ends on October 31 in most areas of the state and earlier in some areas.

After consultation with the CEC, ARB staff believes that a temporary change in the Board's gasoline regulation is essential to the public's general welfare, and should be made on an emergency basis. To minimize the environmental impacts staff believes that the temporary changes should be limited to the RVP portion of the rules, thus preserving the public health protection of the regulations to the greatest degree possible.

Staff expects that the CEC staff will provide findings and recommendations regarding the expected gasoline supply shortage and the potential impacts on fuel prices. While the increase in emissions is significant, staff believe temporary change in the Board's gasoline regulations is warranted to minimize gasoline shortages and price increases.

## II. RECOMMENDATION

Staff recommends that a temporary adjustment to the RVP limits be approved. This one-time adjustment would apply through October 31 when the 2005 RVP control period ends. This action will help ensure adequate supply and availability of gasoline fuel to California consumers, and as a result should help alleviate price increases created as a result of Hurricane Katrina in the Gulf Coast.

## III. BACKGROUND

This chapter describes the existing regulations for motor vehicle gasoline and diesel.

### A. Federal Reformulated Gasoline

The federal Clean Air Act (CAA) Amendments of 1990 directed the U.S. EPA to adopt federal RFG regulations. Phase 1 of the regulations became applicable January 1995 and Phase 2 of the regulations became applicable in January 1999. These regulations require the year-round use of reformulated gasoline (RFG) containing at least 2.0 weight percent oxygen in on-road vehicles in severe and extreme non-attainment areas for ozone. The federal RFG requirements apply in San Diego County, the greater Los Angeles area (Los Angeles, Orange and Ventura Counties, and parts of Riverside and San Bernardino Counties), the greater Sacramento area (Sacramento County and parts of Yolo, Solano, Sutter, Placer, and El Dorado Counties), and the San Joaquin Valley Air Basin. Together, these areas account for about 80 percent of the gasoline sold in California.

The federal Energy Policy Act of 2005 removed the requirement for oxygen in federal reformulated gasoline, allowed the U.S. EPA to grant waivers under certain circumstances, and made other changes.

### B. California's Reformulated Gasoline Program

#### *1. Fuel Specifications*

In November 1991, the ARB approved the Phase 2 reformulated gasoline regulations (CaRFG2) regulations which became applicable beginning March 1, 1996. These regulations established standards for the following eight gasoline properties:

- Reid vapor pressure (RVP)
- the 50 percent distillation temperature (T50)
- the 90 percent distillation temperature (T90)
- sulfur
- benzene
- olefins
- aromatic hydrocarbons
- oxygen

The California Phase 3 Reformulated Gasoline (CaRFG3) regulations were adopted June 16, 2000 following a December 9, 1999 hearing by the ARB. The CaRFG3 regulations prohibited production of California gasoline, after December 31, 2003, with the use of Methyl Tertiary-Butyl Ether, established CaRFG3 standards, and established a CaRFG3 Predictive Model. The Predictive Model provides refiners with flexibility to use alternative formulations while preserving the benefits of the program. The regulations are contained in sections 2260-2273.5, title 13, California Code of Regulations (CCR). The table in Appendix A presents the Phase 3 limits.

With the exception of RVP and oxygen content, the regulations provide producers and importers with three compliance options when supplying gasoline from the production or import facility. First, producers and importers may choose to comply with a flat limit applicable to all the gasoline, or they can meet a more stringent averaging limit. The averaging limits allow some flexibility as some batches of gasoline can be above or below the average specifications. There is no averaging option for RVP and oxygen standards.

The second compliance option allows a producer or importer to use the "Predictive Model" to specify alternative flat and averaging limits that may be optimal for a particular refiner. The Predictive Model is a set of mathematical equations that relate emissions rates of exhaust hydrocarbons, NOx, and potency-weighted toxics for four toxic air contaminants (benzene, 1,3-butadiene, formaldehyde, and acetaldehyde) to the values of the eight regulated gasoline properties. The Predictive Model allows refiners the flexibility to certify alternative formulations by trading off the value of one fuel property against another while maintaining the benefits associated with the reformulated gasoline program.

An alternative gasoline formulation is acceptable if emissions of hydrocarbons, NOx, and potency-weighted toxics resulting from this formulation are no greater than emissions from gasoline having the basic flat or averaging limits set forth in the CaRFG3 standards. The third compliance option allows certification of alternative formulations based on the results of vehicle emissions testing. Currently, almost all the gasoline sold in California complies with the CaRFG regulations through the use of the Predictive Model.

### *2. RVP Provisions*

The maximum cap limit for the RVP of California gasoline is 7.2 psi as presented in Appendix A, during the following regulatory control periods throughout California:

(A) April 1 through October 31:
South Coast Air Basin and Ventura County
San Diego Air Basin
Mojave Desert Air Basin

Salton Sea Air Basin

(B) May 1 through September 30:
Great Basin Valley Air Basin

(C) May 1 through October 31:
San Francisco Bay Area Air Basin
San Joaquin Valley Air Basin
Sacramento Valley Air Basin
Mountain Counties Air Basin
Lake Tahoe Air Basin

(D) June 1 through September 30:
North Coast Air Basin
Lake County Air Basin
Northeast Plateau Air Basin

(E) June 1 through October 31:
North Central Coast Air Basin
South Central Coast Air Basin (Excluding Ventura County)

## C. Diesel

"CARB diesel" is diesel fuel that meets the ARB's regulations controlling the sulfur and aromatic contents of diesel fuels used in motor vehicles. The California Division of Measurement Standards requires that motor vehicle diesel fuel meet ASTM D-975 specifications and have a minimum cetane number of 40. About 90 percent of the diesel fuel sold or supplied in California meets "CARB diesel" requirements. The requirements of the CARB diesel fuel regulations are summarized in Table III.1 along with the EPA diesel fuel requirements.

Section 2281 of Title 13, CCR regulates the sulfur content of vehicular diesel fuel sold or supplied in California. The regulation was approved by the ARB in 1988 originally as section 2255 and was implemented in 1993 statewide. All diesel fuel sold or supplied in California for motor-vehicle use, both on-road and off-road, must have a sulfur content no greater than 500 parts per million by weight (ppmw). The sulfur content of motor vehicle fuel in the South Coast Air Basin and Ventura County had been limited to 500 ppmw since 1985 for large refiners and 1989 for small refiners.

Section 2282 of Title 13, CCR regulates the aromatic hydrocarbon content of vehicular diesel fuel sold or supplied in California. The regulation was approved by the ARB about 17 years ago in 1988 originally as Section 2256 and was implemented in 1993. The aromatic hydrocarbon content of vehicular diesel sold or supplied in California must not exceed 10 percent by volume for large refiners. Small refiners are allowed to meet a less stringent 20 percent limit on aromatic

hydrocarbons. The regulation allows alternatives to the aromatic hydrocarbon limit if a refiner can demonstrate that the alternative formulation provides emission reductions equivalent to that obtained with the basic 10- or 20-percent aromatic hydrocarbon reference fuels, as determined through a series of engine emission tests.

Section 2284 of Title 13, CCR, approved by the ARB in July 2003, sets the lubricity standards of 520 microns based on American Society for Testing and Materials (ASTM) test method D6079-02, Standard Test Method for Evaluating Lubricity of Diesel Fuels by the High Frequency Reciprocating Rig (HFRR).

**Table III.1: Requirements of Motor Vehicle Diesel Fuel Regulations**

| | EPA | CARB |
|---|---|---|
| 1. Applicability | On-road | On- and Off-road |
| 2. Specifications<br>a) Maximum Sulfur Content (ppmw)<br>b) Maximum Aromatic Hydrocarbon Content[1] (% by volume)<br>- Independent and Large Refiners<br>- Small Refiners | 500<br>35% or Cetane No. ≥40 | 500<br>10%<br>20% |
| 3. Allows for Certification of Alternative Formulations | No | Yes[2] |

[1] Averaging of aromatic hydrocarbon content allowed over a period of 90 days.
[2] Requires demonstration of equivalency to the appropriate 10% or 20% aromatic hydrocarbon reference fuel.

## IV. ACTIONS IN RESPONSE TO HURRICANE KATRINA

This Chapter describes the recent actions taken by the U.S. Environmental Protection Agency and some states to allow increases in gasoline supply.

### A. Hurricane Katrina

On August 25, Hurricane Katrina made first landfall on the south Florida coast, then crossed the state and greatly increased in intensity as it moved over the Gulf of Mexico. On August 28, Katrina turned north and made second landfall on the south U.S. coast, causing massive damage and flooding to broad areas of Alabama, Louisiana, and Mississippi.

As of September 2, nine major oil refineries remained shut in Louisiana and Mississippi and several others had reduced output. With about 2 million barrels per day of refining capacity shut in or reduced due to Hurricane Katrina, approximately 1 million barrels per day (42 million gallons per day) of gasoline is not being produced. This represents about 10 percent of the nation's consumption, and is a major drop in the normal flow of gasoline through the system. In addition, major pipelines originating in the Gulf of Mexico area (namely the Plantation and Colonial product pipelines and the Capline crude oil pipeline) have been severely impacted or are closed. Over the weekend some progress was made at some of the facilities, however, the distribution of gasoline, particularly in the Gulf Coast, Midwest, and East Coast regions of the country, has been significantly affected, and recovery is expected to take many weeks.

### B. U.S. EPA Actions

In response to Hurricane Katrina, on August 30, 2005 U.S. EPA issued a waiver of the federal RVP limits for the states of Alabama, Florida, Louisiana and Mississippi. U.S. EPA Administrator Stephen L. Johnson determined that the impact of Hurricane Katrina created an “extreme and unusual fuel supply circumstance” in Alabama, Florida, Louisiana and Mississippi and that the situation will prevent the distribution of an adequate supply of fuel to consumers that is compliant with the Clean Air Act. The Administrator also said that this is “a natural disaster that could not reasonably have been foreseen or prevented and not attributable to a lack of prudent planning on the part of the suppliers of the fuel to these affected States.”

Under the authority granted by the U.S. Clean Air Act, the U.S. EPA Administrator has temporarily allowed all parties in the fuel distribution system, including refiners, importers, distributors, carriers and retail outlets (regulated parties) to supply gasoline meeting a RVP standard of 9.0 psi in areas of the affected states where a lower RVP is required. A copy of this letter is presented in Appendix B.

U.S. EPA will temporarily allow regulated parties to supply motor vehicle diesel fuel to affected states having a sulfur content greater than 500 parts per million (ppm) because of the expected shortage of motor vehicle diesel fuel meeting the 500 ppm sulfur standard.

This waiver became effective immediately and would continue through the remainder of the high-ozone period, through Sept. 15, 2005. However, retail outlets or wholesale purchaser-consumers that receive motor vehicle diesel fuel having a sulfur content greater than 500 ppm, under the terms of this waiver may continue selling or dispensing this fuel after Sept. 15, 2005, until their supplies are depleted.

On August 31, 2005, the U.S. EPA extended the fuel waiver to all 50 states, U.S. territories and the District of Columbia:

> "In order to increase the supply of gasoline and minimize potential gasoline supply disruptions caused by Hurricane Katrina, U.S. EPA is waiving the requirement to sell 'summer gasoline' which contains a lower volatility limit. This action has the effect of allowing early use of wintertime gasoline. U.S. EPA is also allowing the use of diesel fuel which exceeds 500 ppm sulfur content. Both waivers are effective immediately and will continue through September 15th of this year and are applicable throughout all 50 states, U.S. territories and the District of Columbia."

In order to provide comparable relief to all regions of the United States, the U.S. EPA changed the relief from easing the RVP requirement to 9 psi to accelerating entrance into the non-RVP controlled winter season that would have started on September 15, 2005 for areas using federal fuel. For those states or regions that have additional fuel regulations imposed by state regulators, relief must be provided by the appropriate state agency. A copy of this letter is presented in Appendix B.

## C. Other States Actions

In addition to the actions taken by the U.S. EPA, states with additional state fuel regulations have provided relief from those regulations to alleviate supply pressures caused by Hurricane Katrina. Those actions are listed below.

### *1. Georgia*

On September 1, 2005 the Georgia Department of Natural Resources made a formal request to allow the importation, distribution, and sale of gasoline that does not meet the low RVP and low sulfur requirements of Georgia's federally-enforceable SIP, and requested that the EPA waive federal enforcement of these provisions until midnight on September 15, 2005. This waiver was granted to the state of Georgia by the U.S. EPA. The letter granting Georgia this waiver can be seen in Appendix B.

### *2. Arizona*

On September 1, 2005 Governor Napolitno authorized the Arizona Department of Weights and Measures to exercise its discretion and not take enforcement action for the transport, delivery, and sale of gasoline other than Arizona Cleaner Burning Gasoline (CBG) to the retail outlets in CBG Covered Area and high-sulfur diesel for on-road use statewide (red-dyed diesel excepted). This action was taken in conjunction with the waiver issued by the U.S. EPA in response to Hurricane Katrina on August 31, 2005. The letter by the Arizona Department of Weights and Measures issuing this relief can be seen in Appendix C.

### *3. Nevada, Oregon, and Washington*

In Nevada, Oregon, and Washington, appropriate action has been provided to implement the relief granted by the U.S. EPA. In response to the waiver issued by the U.S. EPA on August 31, 2005, Kinder Morgan began shipping 9 psi RVP conventional regular and premium gasoline to Reno, Nevada on the North Line. Kinder Morgan on September 1, 2005 began shipping 11.5 psi RVP conventional gasoline in Oregon and Washington. Shipments of diesel remained restricted to 500 ppm sulfur or less, as no diesel has been shipped above this limit since 1999, and current production should be able to satisfy demand. The letter issued by Kinder Morgan addressing these issues can be seen in Appendix C.

### *4. Virginia*

On Sept. 2, EPA granted a limited waiver through Sept. 9 from the reformulated gasoline requirement for gasoline sold in the Richmond, Va., metropolitan area. The U.S. EPA will temporarily allow regulated parties to produce, import, distribute and sell gasoline that does not comply with Virginia's federally approved state implementation plan. These waivers will be in effect until midnight September 9. However, retail outlets or wholesale purchase consumers who receive gasoline under the waiver may continue selling it or dispensing it until their supplies are depleted.

## V. PROPOSED AMENDMENT TO INCREASE FLAT AND CAPS LIMITS FOR REID VAPOR PRESSURE

This chapter describes the staff's proposed amendment to title 13, CCR, §2262, "The California Reformulated Gasoline Phase 2 and Phase 3 Standards." The proposed amendment would increase the limit for the RVP of motor vehicle gasoline fuel to 9 psi for the remainder of the 2005 vapor control season.

The text of the proposed amendment is presented in Appendix D.

### A. Requirements for Adopting an Emergency Amendment

Under the California Administrative Procedure Act and state regulations an agency is authorized to amend a regulation on an emergency basis without following the regular procedural requirements upon a finding that the amendment "is necessary for the immediate preservation of the public health and safety or general welfare." The Office of Administrative Law (OAL) has an abbreviated maximum 10-day period to review the amendment after it is submitted by the adopting agency, and the amendment may go into effect immediately after it is approved by the OAL and filed with the Secretary of State. An amendment adopted on an emergency basis may remain in effect for no more than 120 days unless the adopting agency complies with the procedural requirements for a normal amendment. (Government Code section 11346.1.)

### B. Rationale for Emergency Action

Based on the CEC and U.S. Department of Energy information, currently California imports about 9 percent of its motor vehicle gasoline, either as finished gasoline or as blending components. Most imports are from the Gulf of Mexico (including the Virgin Islands), Canada (Nova Scotia) and Europe (Finland). With the disruption in the Gulf of Mexico (Louisiana and Mississippi), imports that would otherwise come to California are being diverted to the eastern seaboard to help replace lost gasoline supply there and in the midwest. This could leave California supply short by between 5 to 10 percent when these imports do not arrive as previously expected in the next week or so.

Since Hurricane Katrina, wholesale prices of gasoline have risen by about $0.70 per gallon in California. In New York and other areas directly impacted by refinery and pipeline shutdowns wholesale prices initially increased by an even greater amount. If, California supply is unable to meet demand it is expected that California price increases could exceed those being experienced in the eastern U.S. To help prevent supply shortages and the resulting price increases, additional California production is needed, as quickly as is possible. Based on information from the CEC and affected industry, the only option to significantly increase production is to modify the RVP requirements. Accordingly, staff is

proposing that temporary changes in the ARB's regulations be made on an emergency basis for the remainder of the 2005 RVP season.

### C. Increase Flat and Cap Limits for Reid Vapor Pressure

Staff proposes that the gasoline regulations be amended to increase both the Flat and Cap limits for RVP to 9 psi for the remainder of the vapor control season, ending no later than October 31, 2005.

As discussed above, a finding of emergency must be made in order to amend the motor vehicle gasoline rules on an emergency basis. Staff believes that a finding of emergency is justified based on the disruptions in supplies of gasoline and gasoline blend components as a result of Hurricane Katrina shutting down several major oil refineries and pipelines in the Gulf Coast, especially Louisiana and Mississippi.

### D. Diesel

Staff is not proposing amendments to the ARB's regulations governing diesel fuels. The U.S. EPA is temporarily allowing regulated parties to supply motor vehicle diesel fuel having sulfur content greater than 500 parts per million. The 500 parts per million limit is temporarily lifted until September 15, 2005. This relief was proposed to allow on-road motor vehicles to use non-road diesel fuel should there be a shortage or lack of availability of on-road diesel fuel. U.S. EPA regulation allows non-road diesel fuel to contain sulfur concentration up to 5000 ppmw.

Staff is not proposing amendments to ARB's vehicular diesel fuel sulfur standard to be consistent with the U.S. EPA actions because California's diesel fuel regulations require that fuel used for on-road and off-road, meet the same 500 ppm standard. Therefore, lifting the allowable motor vehicle sulfur levels for diesel fuel would not increase the supply or availability of fuel to consumers.

Generally, diesel fuel for stationary engines in California must meet the same sulfur limit of 500 ppm as motor vehicle diesel fuel. The majority of the production that contains more than 500 ppm sulfur, which account for only one percent of available supplies, is currently used by marine vessels. Allowing diesel fuel with sulfur concentrations greater than 500 ppm would not significantly increase the supply and availability of diesel fuel to consumers.

## VI. POTENTIAL IMPACTS OF THE PROPOSED AMENDMENT ON THE PRODUCTION OF GASOLINE FUEL BY CALIFORNIA REFINERIES

This chapter describes the potential impacts of the proposed amendment on the production of gasoline fuel by California refineries.

### A. Volume Increase due to Increasing the RVP Limit

The objective of the amendment is to avoid disruptions of gasoline fuel supplies in the state. Increasing the RVP limit for California gasoline will allow California refineries to produce extra volume of gasoline almost up to 10 percent.

Currently, most CaRFG contains between 5.7 and 7.7 percent ethanol. In the ozone season, CaRFG is limited to an RVP of no more than 7.2 psi. To accommodate ethanol and comply with the RVP specification for finished gasoline, the gasoline portion is refined to have a RVP of about 5.8 to 6.0 psi. This is because when ethanol is added to gasoline the resulting blend has a RVP of about 1.0 psi higher than the gasoline by itself. This means that the lighter more volatile components, mainly pentanes, equal to about 6 percent by volume are removed from gasoline already meeting a RVP of 7.0 psi.

Increasing the RVP limit of finished gasoline to 8.0 psi would allow about a 6 percent increase in the volume of gasoline. A further increase to 9.0 psi would allow butanes to be retained or added to gasoline to increase the produced volume by another 3 to 4 percent.

As described above, staff estimates that increasing the summer ozone season RVP limit from 7.0 to 9.0 will allow an increase in gasoline production of up to 10 percent by allowing the more volatile gasoline components to be retained or added back in. This is consistent with the findings by the U.S. EPA that for the same volume of crude processed and without impacting the refining of other products that RVP relief is the only effective option to increase gasoline production during the RVP control period.

Going to a limit higher than 9.0 RVP during the months of September and October would not make significantly more gasoline available to California motorists. For most of California, ambient temperatures can routinely be in the mid $90^{o}$ Fahrenheit (F) range. At these temperatures, gasolines with RVP higher than 9 psi will have significantly higher evaporative emissions. An 11.0 psi RVP gasoline could have 25 percent more evaporative emissions than a 9.0 psi RVP gasoline at $90^{o}$ F, while only providing a very modest increase in volume.

## B. Alternative Options

Staff considered the following alternatives to the proposed amendment:

- Default to Federal RFG. This could allow for a very small amount of additional potential relief above the recommended proposal. However, this is limited by the ability to process crude oil because refiners are already processing the maximum amount possible. Also, this would result in significant increases in emissions of oxides of nitrogen and toxic air contaminants with no compensating increase in gasoline supplies.

- Default to conventional gasoline. This would not change the above by any significant amount. Except for volatility, the other CaRFG and Federal RFG specifications do not significantly impact the volume of gasoline that can be refined.

- Further facilitate the use of 10 percent ethanol. Current ARB regulations allow up to 10 percent ethanol to be used, but requires that any emissions increases associated with higher oxygen content be compensated for by controlling other fuel properties. Removing these emission mitigation requirements could allow up to 3 percent increase in supply, provided that additional ethanol supplies could be made available from the Midwest or other locations. However, under today's circumstances this is not likely. Ethanol inventories are balanced around current use patterns, and the average ethanol content of gasoline cannot be increased unless greater supplies are imported into California. This is not expected to be possible in the near term. Current ethanol production is about 4 billion gallons per year, while gasoline production is about 140 billion gallons per year. Almost all ethanol produced is currently being used by California and other states, thus increasing California's consumption of ethanol would only reduce it's availability in other states.

- No Action. If the ARB did not amend the regulation to increase limits for the RVP of motor vehicle gasoline fuel to 9.0 psi for the remainder of the vapor control season, California motor vehicle gasoline fuel supplies could potentially fall short by about 5 to 10 percent.

## VII. ENVIRONMENTAL IMPACTS OF THE PROPOSED AMENDMENT

This chapter describes the possible environmental impacts of the proposal.

### A. Effects of the Proposed Amendments on the Vehicle Emissions Inventory

The ARB staff estimates that the implementation of the emergency amendment would result in a temporary increase in VOC emissions. Table VII.1 shows three options that were evaluated, and their relative impacts on gasoline production and emissions. The first option, the recommended amendment, is relaxing the current RVP flat limit for CaRFG from 7.0 psi to 9.0 psi. This RVP increase of about 2 psi would give refiners flexibility to use more volatile blendstocks that could increase production volume by up to 10 percent.

The higher RVP gasoline is estimated to increase the 2005 statewide on-road vehicles evaporative VOC emissions by approximately 50 tpd or about 7 percent of on-road vehicle VOC emissions and about 2 percent of overall VOC emissions. Staff also estimate on- and off-road emissions impact of the proposal to be about 75 tpd. This is about 3 percent of total VOC emissions and 1 percent of total (VOC and NOx) ozone precursor emissions.

**Table VII.1**
Impact of Considered Options on Emissions Statewide, 2005

| No. | Option | Emissions[1] |
|---|---|---|
| 1. | CaRFG<br>2 psi RVP Increase (9.0 psi) | +7% VOC (50 tpd) |
| 2. | 10% Ethanol<br>2 psi RVP Increase (9.0 psi) | +5% NOx (30 tpd)<br>+7% VOC (50 tpd) |
| 3. | Default to the U.S. EPA Specification with 9.0 psi RVP cap | +4% NOx (25 tpd)<br>+40% toxics<br>+7% VOC (50 tpd) |

[1]On-road vehicles

Although the proposed RVP limits are expected to take affect immediately, in reality the new blend gasoline would not get to consumer fuel tanks for at about another two weeks; a normal transition time that is required to flush out older batches of gasoline from the distribution system. By then some of the air basins are about to transition to wintertime gasoline. Given these facts and the likelihood that motorists may somewhat curtail their driving in response to recent

gasoline price hikes, the expected emissions increase would be less than estimated above.

Staff also estimated the impact of refiners to blend in more ethanol, up to 10 percent volume, into CARBOB on emissions. As noted previously, this option is limited by the ability to quickly import additional amounts of ethanol. Higher content oxygen fuel would increase NOx emissions by up to 5 percent (30 tpd).

## B. State Implementation Plan

The 1994 SIP for ozone is California's master plan for achieving the federal ozone standard in six areas of the state by 2010. The SIP includes state measures to control emissions from motor vehicles and fuels, consumer products and pesticide usage, local measures for stationary and area sources, and federal measures for sources under exclusive or practical federal control. U.S. EPA approved the 1994 SIP in 1996. Some of the districts have updated their plans. For example, the South Coast Air Quality Management District revised its part of the Ozone SIP in 1997 and again in 1999. U.S. EPA approved the South Coast's 1999 Ozone SIP revision in 2000.

The proposed amendments will result in a temporary increase in emissions. However, U.S. EPA has indicated that this increase in emission above the current approved SIP levels will not be counted against the SIP. In the U.S. EPA's Questions and Answers document released September 2, 2005 states that the, "U.S. EPA interprets the Aug. 31, 2005 waiver to include federally approved SIP RVP requirements. However, individual states must also grant relief from their SIP requirements in order to prevent state law violations." The increase in emission associated with the adoption of the temporary amendments proposed by staff will not adversely affect California's SIP status. A copy of the U.S. EPA's Questions and Answers document is provided in Appendix B.

## C. Water Quality

The proposed amendments are not expected to have any significant impact on the quality of ground or surface water. The proposed amendments would only be in effect until the end of the RVP control season. The expected impacts of the proposed amendments are to allow refiners to produce wintertime blends prior to the end of the RVP control season.

## D. Environmental Justice and Neighborhood Impacts

The primary environmental justice and neighborhood impacts of the proposed action would be an increase in the emissions of hydrocarbons from motor both on-road motor vehicles and off-road engines. However, the portions of the gasoline rules that govern emissions of toxic compounds would be fully pressured. Californians may be exposed to an increase in ozone and evaporative emissions. This increase is expected to be statewide. An offsetting consideration is the potential for shortfalls in fuel supply and expected associated increases in fuel costs if relief is not provided.

## E. Greenhouse Gas Emissions

The proposed temporary amendments are not expected to have a significant impact on the emissions of greenhouse gases. The proposed amendments would be in affect no later than October 31, 2005. There maybe some small decrease in greenhouse gas emission associated with the expected reduction in imports from the Gulf Coast and other regions. Staff is unable to quantify this effect at this time.

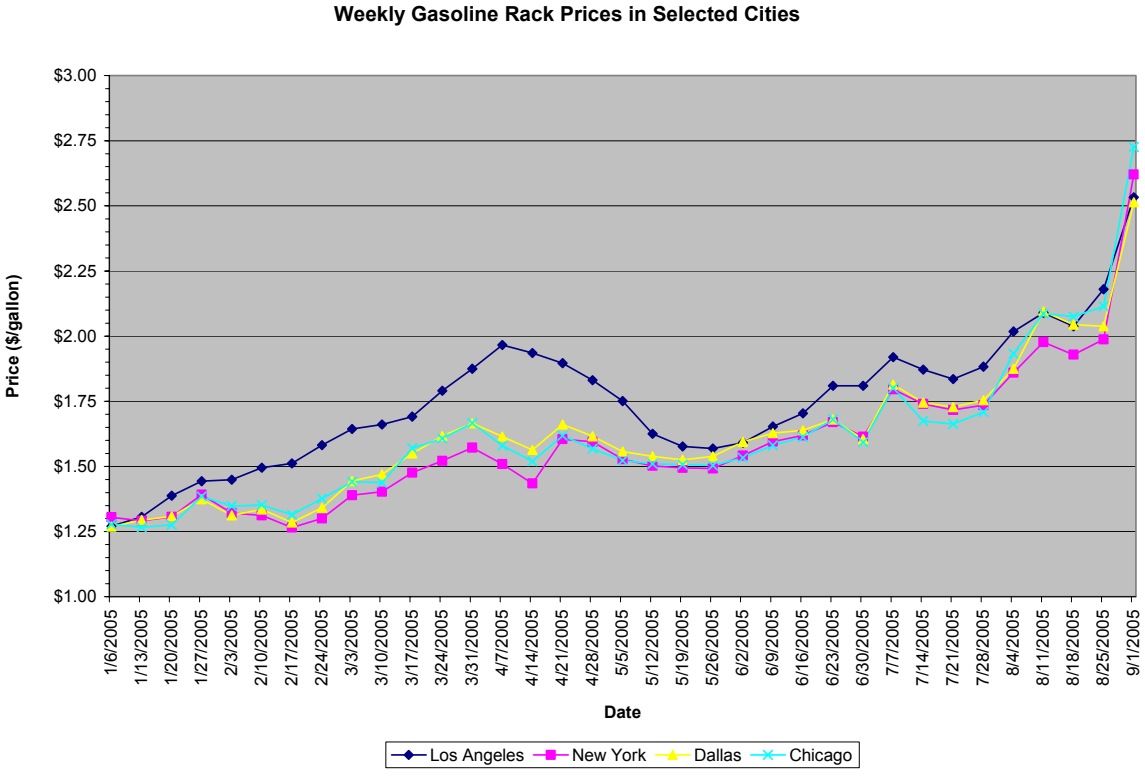
## VIII. ECONOMIC IMPACT OF THE PROPOSED AMENDMENT

### A. California Economy

Without the proposed amendments, staff expects that California would experience about a 5 to 10 percent reduction in production due to the inability to import finished gasoline and blendstocks. This decrease in supply would be expected to have a significant adverse effect on the availability and price of gasoline in California and surrounding states. Figure VIII.1 presents the rack gasoline prices for four US cities. Since the mid-August gasoline prices have increased by more than 60 cents a gallon due to Hurricane Katrina's impact on the Gulf Coast refining industry.

ARB staff, in consultation with the CEC staff, believes that the proposed amendments are essential to provide needed supplies and concurrently help prevent even greater upward price pressure in California. The impact of Hurricane Katrina on the refining industry has resulted in about 10 percent loss in the nation's refining capacity. This loss in capacity has resulted in a significant increase in fuel prices. Without increased in-state production in California, prices will continue to increase and shortages could occur until facilities in the gulf coast are restored and normal imports to California can resume.

**Figure VIII.1**



## B. Small Businesses

Government Code sections 11342 et. Seq. requires the ARB to consider any adverse effects on small businesses that would have to comply with a proposed regulation. In defining small business, Government Code section 11342 explicitly excludes refiners from the definition of "small business." Also, the definition includes only businesses that are independently owned and, if in retail trade, gross less than $2,000,000 per year. It is staff's assessment that the proposed changes would greatly benefits small business owner by increasing the supply and availability of California gasoline.

Without the proposed amendments staff expects that California would experience about a 5 to 10 percent reduction in production due to the decreased importation of finished gasoline and blendstocks. This decrease in supply and availability of gasoline would be expected by have a significant adverse effect on the price of gasoline in California and surrounding states.

## IX. REFERENCES


Air Resources Board, *Proposed Amendments to the California Diesel Regulations*, *Final Statement of Reasons*, June 2004.

Air Resources Board, *Proposed Amendments to the California Diesel Regulations*, *Staff Report: Initial Statement of Reasons*, June 6, 2003.

Air Resources Board, *Proposed California Phase 3 Reformulated Gasoline Regulations, Proposed 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, Final Statement of Reasons,* June 2000

Air Resources Board, *Proposed California Phase 3 Reformulated Gasoline Regulations, Proposed 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, Staff Report: Initial Statement of Reasons*, October 22, 1999.

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United States Department of Energy*, Hurricane Katrina's Impact on the U.S. Oil and Natural Gas* (2005, September) Retrieved on September 3, 2005, from http://tonto.eia.doe.gov/oog/special/eia1_katrina.html

# X. APPENDICIES

# A. APPENDIX A

## CALIFORNIA REFORMULATED GASOLINE PHASE 3 STANDARDS

The California Reformulated Gasoline Phase 3 Standards

| ***Property*** | ***Flat Limits*** | ***Average Limits*** | ***Cap Limits*** |
|---|---|---|---|
| | ***CaRFG Phase 3*** | ***CaRFG Phase 3*** | ***CaRFG Phase 3*** |
| Reid Vapor Pressure[1] (pounds per square inch) | 7.00 or 6.90[2] | Not Applicable | 6.40 - 7.20 |
| Sulfur Content (parts per million by weight) | 20 | 15 | 60[4] |
| | | | 30[4] |
| Benzene Content (percent by volume) | 0.80 | 0.70 | 1.10 |
| Aromatics Content (percent by volume) | 25.0 | 22.0 | 35.0 |
| Olefins Content (percent by volume) | 6.0 | 4.0 | 10.0 |
| T50 (degrees Fahrenheit) | 213 | 203 | 220 |
| T90 (degrees Fahrenheit) | 305 | 295 | 330 |
| Oxygen Content (percent by weight) | 1.8 - 2.2 | Not Applicable | 1.8[6]-3.5[7] |
| | | | 0[6] - 3.5[7] |
| Methyl tertiary-butyl ether (MTBE) and oxygenates other than ethanol | Prohibited as provided in § 2262.6 | Not Applicable | Prohibited as provided in § 2262.6 |

1 The RVP standards apply only during the warmer weather months identified in section 2262.4.

2 The 6.90 pounds per square inch (psi) flat limit applies only when a producer or importer is using the evaporative emissions model element of the CaRFG Phase 3 Predictive Model, in which case all predictions for evaporative emissions increases or decreases made using the evaporative emissions model are made relative to 6.90 psi and the gasoline may not exceed the maximum RVP cap limit of 7.20 psi. Where the evaporative emissions model element of the CaRFG Phase 3 Predictive Model is not used, the RVP of gasoline sold or supplied from the production or import facility may not exceed 7.00 psi.

3 For sales, supplies, or offers of California gasoline downstream of the production or import facility starting on the date on which early compliance with the CaRFG Phase 3 standards is

permitted by the executive officer under section 2261(b)(3), the CaRFG Phase 2 cap limits for Reid vapor pressure and aromatics content shall be 7.20 psi and 35.0 percent by volume respectively.

[4] The CaRFG Phase 3 sulfur content cap limits of 60 and 30 parts per million are phased in starting December 31, 2003, and December 31, 2005, respectively, in accordance with section 2261(b)(1)(A).

[5] Designated alternative limit may not exceed 310.

[6] The 1.8 percent by weight minimum oxygen content cap only applies during specified winter months in the areas identified in section 2262.5(a).

[7] If the gasoline contains more than 3.5 percent by weight oxygen from ethanol but no more than 10.0 volume percent ethanol, the maximum oxygen content cap is 3.7 percent by weight.

## B. APPENDIX B

## EMERGENCY ACTIONS BY UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

## C. APPENDIX C

## EMERGENCY REGULATION ORDERS BY OTHER STATES

# D. APPENDIX D

## PROPOSED EMERGENCY REGULATION ORDER

## Amendments to the California Phase 3 Reformulated Gasoline Regulations