

Facsimile Cover Page

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UNOCAL CORPORATION

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DATE: 3/21/95

TO: DAN DONOHUE

CALIFORNIA AIR RESOURCES

FAX #: 916-3275621

FROM: NICK ECONOMIDES

PHONE NO.: 213-9776844

COMMENTS: ORIGINAL IS IN THE MAIL (FEDEX)

THE FAX MAIL
AND NOTHING
BUT THE FAX.



TOTAL PAGES INCLUDING COVER: 4

**SEVENTY-SIX PRODUCTS COMPANY****WILLIAM W. LAMB**
General Manager
Risks Planning & Technology

March 20, 1995

Dan Donohue, Manager
Technical Analysis Section
Stationary Source Division
California Air Resources Board
P.O. Box 2815
Sacramento, California 95814**PROPOSED AMENDMENTS TO PHASE 2
RFG REGULATIONS (15-DAY PACKAGE)**

Dear Mr. Donohue,

Seventy-Six Products Company, a wholly owned subsidiary of Union Oil Company of California, submits the following list of suggested revisions to the Phase 2 RFG Regulation Amendments proposed by CARB on March 6, 1995:

Attachment B, Page 10, Table 6

The first entry in this Table describes the equivalence testing to be performed when both the maximum and minimum of the candidate specification for oxygen lie between 1.8 and 2.2 weight percent. The minimum is currently shown as [≥ 1.8] and the maximum as [≤ 2.2]. To be consistent with the convention used to define the remainder of the cases in the same Table, we suggest that both the minimum and maximum entries should be represented as [$\geq 1.8, \leq 2.2$].

Attachment B, Pages 10-33, Complex Model Equations

The changes implemented as a result of setting RVP equal to 7.00 psi appear to be incomplete. Once constants are calculated as the result of this procedure, term consolidation should be performed in the following equations:

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Page #	Emission	Tech Type	Terms to Consolidate
17	NOx	3	RVP with intercept
18	NOx	4	RVP with intercept
18 & 19	NOx	4	RVPOXY with Oxygen
21	HC	3	RVP with intercept
21 & 22	HC	3	RVPT50 with T50
22	HC	4	RVP with intercept
30	Benzene	4	RVP with intercept
33	Acetaldenhyde	4	RVP with intercept

Attachment B, Pages 40-41, Tables 11&12

In line with the term consolidations described above by setting RVP equal to 7.00 in all the Complex Model equations, changes need to be made to both Tables 11 and 12. The relevant portions of these two Tables are shown below in before and after fashion.

Table 11 as is with values to be corrected shown

Pollutant Emission	Tech 3		Tech 4	
	NOx	HC	NOx	HC
Intercept	-0.15597638	-0.79454695	-0.58546115	-1.18303668
RVP	-0.01671797	0.004470128	0.03005909	-0.00850444
Oxygen			0.011321599	
T50		0.010253528		
RVPT50		-0.01626671		
RVPOXY			0.006283521	

Table 11 with corrected values shown

Pollutant Emission	Tech 3		Tech 4	
	NOx	HC	NOx	HC
Intercept	-0.108411658	-0.80716502	-0.8825367	-1.15555
RVP				
Oxygen			-0.008991891	
T50		0.056534		
RVPT50				
RVPOXY				

Table 12 as is with values to be corrected shown

Pollutant Emission	Tech 4			
	Benzene	Butadiene	Formaldehyde	Acetaldehyde
Intercept	2.078612			-0.30842
RVP	0.01972			0.061495

Table 12 with corrected values shown

Pollutant Emission	Tech 4			
	Benzene	Butadiene	Formaldehyde	Acetaldehyde
Intercept	2.014861			-0.50722
RVP				

Attachment B, Pages 40-41, Table 12

Please confirm that the new coefficient for the oxygen term in the Tech 3 Benzene Equation (shown as -0.034762) is correct. The sign of the coefficient has changed (versus the previous Table 12). Also, there has been a change of two orders of magnitude in the absolute value of this coefficient. The reason this change is difficult to understand, given that the revisions to Table 12 merely involve re-regression of the data after removal of statistically non-significant terms.

If you have any questions or require clarification on the information submitted, please contact Nick Economides at (213) 977-6848.

Sincerely,



for

Dennis W. Lamb,
General Manager,
Fuels Planning & Technology

California

Renewable

Fuels Council

Renewable Resources → Cleaner Fuels → Cleaner Air

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AIR RESOURCES BOARD
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COMMENTS REGARDING THE
CALIFORNIA AIR RESOURCES BOARD

**"California Phase 2 Reformulated Gasoline Regulations
Including Amendments Providing for the Use of a Predictive Model"**

The California Renewable Fuels Council supports the efforts by ARB staff to develop a Predictive Model to provide greater flexibility in complying with its Phase II gasoline specifications. CRFC is concerned, however, that the model might have a bias against the use of higher levels of oxygen. CRFC, on behalf of the California ethanol industry, believes that oxygen should be allowed to vary up to 3.5 percent by weight under the Predictive Model and commits to working with staff over the next months to provide the technical justification for this point. CRFC strongly believes that amending the Predictive Model in the future to allow up to 3.5 percent oxygen by weight will provide refiners an important option in complying with Phase II regulations.

Section III.C., and IV.A.2. "Adjust the RVP*Oxygen Response in the Oxides of Nitrogen Equation for Tech Class 4." The predictive model methodology led to a version of the model which responded to low RVP and oxygen by the Tech 4 Class NO_x equation that was not supported by the data. Therefore, staff proposed modifications to linearize or "flatten out" the RVP and oxygen response. This reaction by the model seems to identify an area in the methodology that requires continued development and refinement in order to make a model that would be more robust. The relationship between RVP, oxygen and NO_x is critical to the ethanol industry and we are currently supporting research to further explore this relationship within the framework of the predictive model methodology in order to provide a better statistical fit to the data. CRFC strongly urges staff to continue to refine this relationship within the model.

Table 7, Optional Worksheet for Candidate and Reference Fuel Specifications. The Reference Fuel specification for RVP has been fixed at 7.0 psi. This approach seems appropriate for use for summertime fuels, however for any gasoline refiner or producer that chooses to use the Predictive Model for certifying a fuel for use during the wintertime this approach may not prove satisfactory. CRFC would urge ARB staff to continue to look at the issue of whether the Predictive Model can be used for wintertime fuels.

Resolution 94-38 "There is a possibility that the amendments approved herein may sometimes result in an increase in summertime CO emissions in 1996 and subsequent years when the predictive model is used because gasoline producers will not be required to demonstrate that there will be no increases in CO;" ARB has predicted that California will be in attainment for CO by 1996 except in the Los Angeles basin area, however the predictive model no longer quantifies CO emissions. CRFC would urge ARB staff to consider an option for CO to be included within the Predictive Model as a means of monitoring CO levels.

Resolution 94-38 "...a minimum of 2.0 percent oxygen by weight throughout the year will help minimize CO emissions and will fully mitigate any increase in CO emissions that could otherwise be associated with use of the California Predictive Model approved herein;" CRFC disagrees with this argument since the Predictive Model no longer contains an oxygen term. CRFC suggests that oxygen levels at a minimum of 2.7 percent by weight in the winter months as stipulated in the CAAA of 1990 would allow for greater CO reductions without exacerbating other air quality problems. (It should be noted that California has not received a waiver from EPA for winter oxygen levels below 2.7 percent by weight.)

The California Renewable Fuels Council is supportive of the work of ARB staff and industry representatives in the development of the Predictive Model. CRFC also acknowledges that the Predictive Model in its current form will require review at regular intervals to incorporate changes in the predictive model methodology as it evolves through further research. We would urge the Board to set policy for the regular review of the Predictive Model.

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Chevron

March 21, 1995

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Chevron U.S.A. Products Company
675 Market Street
San Francisco, CA 94105

Via Fax (916) 322-4737

Dixon B. Smith
General Manager
Alternative Fuels
Phone 415 894 4036
Fax 415 894 2769

Ms. Pat Hutchins, Board Secretary
California Air Resources Board
P. O. Box 2815
Sacramento, CA 95812

Dear Ms. Hutchins,

Chevron is pleased to comment on the modified regulatory text regarding the use of the predictive model to evaluate and approve alternative Phase 2 gasoline formulations, and to the modifications to the Phase 2 regulations that are designed to facilitate introduction of the fuel into the State.

We support the changes contained in the amendments released for public comment on March 6, 1995. We appreciate the cooperative nature of the CARB Staff to develop workable regulations.

Sincerely,

cc: Dan Donohue
Bob Fletcher
Dean Simeroth
Peter Venturini



15-Day Comment
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 SSB
 31 March 1995

STATE OF CALIFORNIA
 AIR RESOURCES BOARD
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Gina Grey
 Managing Coordinator
 Board Members
 California Air Resources Board
 c/o Board Secretary
 P.O. Box 2815
 Sacramento, CA 95812

Re: Proposed Amendments to the CA Phase 2 Reformulated Gasoline Regulation,
 Including Amendments Providing for the Use of a Predictive Model

Dear Board Members:

WSPA has been deeply involved in the development of the California Phase 2 reformulated gasoline regulations, in particular the use of the predictive model to evaluate and approve alternative gasoline formulations. At the June 9, 1994 Air Resources Board hearing to address the amendments to the Phase 2 RFG regulations, WSPA provided oral and written comments which were supportive of the suggested amendments. Some of these changes to the model occurred after the release of the 45 day notice, and WSPA recognizes the need to address them in this 15 day package. However, completion of this and similar 15 day packages in a more timely fashion by CARB is essential to ensure a smooth transition to Phase 2 RFG.

Upon review of the 15 day package, WSPA members have found that CARB staff has integrated all the changes requested by the Board. We do have a concern over the revisions to Table 12 "Coefficients for Toxics Equations": in particular a change in direction and magnitude of the coefficient value for the oxygen/benzene interaction (formally 0.00010461, now - 0.034762). We would like to request staff review Table 12 to assure the coefficients are correct.

Other than the above-mentioned concern, WSPA fully supports CARB staff in the development and amendments included in this version of the model. We consider the changes, both to the predictive model and averaging protocol, to be essential to the success of the Phase 2 RFG program. WSPA believes the proposed model meets the requirements to balance enforceability, emissions benefits and flexibility. Once again we would like to recognize the efforts and cooperation of staff, particularly on the development of the predictive model.

Sincerely,

cc: P. Venturini
 D. Donohoue
 B. Fletcher



Environmental and
Safety Engineering
Ford Automotive Operations

Ford Motor Company
The American Road
Dearborn, Michigan 48121

March 21, 1995

Ms. Pat Hutchens
Board Secretary
State of California
Air Resources Board
Post Office Box 2815
Sacramento, California 95812

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STATE OF CALIFORNIA
AIR RESOURCES BOARD
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Dear Ms. Hutchens:

Ford Motor Company (Ford) appreciates this opportunity to provide comments on the modifications to the California Phase 2 reformulated gasoline regulations, including amendments providing for the use of a predictive model.

We appreciate the continuing efforts the Air Resources Board Staff has put into the development of the predictive model. As these recent amendments demonstrate, the Staff has been receptive and willing to address the concerns raised by both the oil and automotive industries. Nearly all comments that Ford has raised in the past appear to have been addressed.

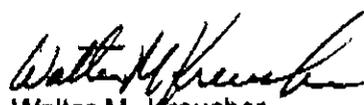
The complexity of the model, and the challenge of accurate emissions predictions, would dictate that improvements may always be possible in the future. A prime example is the model's failure to predict aldehyde emissions as a function of fuel oxygenate type and content. We would expect, from the chemistry of aldehyde production in vehicle emissions, that increases in oxygen (and the type of oxygenate used) would increase aldehyde and other toxic emissions. As the overall model output is in terms of potency-weighted toxics, this may not play a major role.

We are more concerned with the way the new T_{50} requirement may be implemented. The new provision allows T_{50} to go below 180°F. Recently, ASTM began considering reducing T_{50} in Class D and E areas to 150°F. If this change is enacted, it could result in driveability problems, such as poor hot restart performance and/or poor idle quality.

As we stated, through AAMA, earlier in this rulemaking process, we would encourage a process through which the Staff can update the model to improve its prediction capability. However, this process must be implemented in a manner which would not cause undue burden on the fuel providers who depend on the model for their compliance demonstration.

If you have any questions regarding our comments, please feel free to contact me at (313) 845-8247.

Sincerely,


Walter M. Kreucher
Manager, Advanced
Environmental &
Fuels Engineering