

Western Australian

Department of the Environment

452/99

James Forrest

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Dear Graeme

SETTING NATIONAL FUEL QUALITY STANDARDS – PAPER 7 – DISCUSSION PAPER ON DIESOHO

I refer to your letter of 27 May 2004 inviting the Department of Environment to provide comments on the development of a fuel quality standard for diesohol.

The *Setting National Fuel Quality Standards – Paper 7 – Discussion Paper on Diesohol* provides an objective analysis of the issues and options for the development of a fuel quality standard for diesohol. The Department has reviewed the Paper and is supportive of developing a fuel quality standard for diesohol as detailed.

In addition the Department provides the following comments:

- In terms of the use of diesohol, the Department is not aware of any blending or use of diesohol within WA.
- It is noted that the oxygenate properties of the alcohol in diesohol result in a potential decrease in emissions of particulate matter (PM). This advantage is partially off set by possible increases to hydrocarbons (HC) and carbon monoxide (CO). There is also concern regarding possible increases in oxides of nitrogen (NO_x) emissions.
- By developing an appropriate fuel quality standard, emissions can be minimised. This is particularly relevant for potential increases in emissions of NO_x, which can be minimised by controlling the cetane parameter. Cetane is further commented on at question box 6.
- All diesel used in the blending of diesohol should be required to meet the standards for diesel as set out in the Determination. Likewise, the alcohol used for blending should meet all future standards.
- Due to the technical nature relating to testing methods, the Department is not able to provide comment on the appropriateness of testing methods raised throughout the Paper in the question boxes.

- The Department has provided specific comments relating to the questions posed in the question boxes at Attachment 1.

Thank you for the opportunity to comment on the development of a fuel quality standard for diesohol.

Any inquiries related to this submission should be directed to James Forrest on (08) 9278 0638 or james.forrest@environment.wa.gov.au.

Yours sincerely

Fred Tromp
DIRECTOR, RESOURCE SCIENCE

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Comments Relating to Question Boxes

Box 1. Vehicle Warranties and the Use of Diesohol

The development of a fuel quality standard for diesohol will provide engine manufacturers with an assured standard for diesohol, such that they will be able to inform customers as to whether their engine can be used with diesohol without affecting the engine warranty, and also provide guidance on adjustments to the engine are required to improve performance on diesohol. Without a consistent standard, this would prove difficult.

Box 2. Preferred Option for the Regulation of Diesohol

If certain diesohol parameters fail to meet minimum requirements, engine operability may be compromised, resulting in higher emissions than vehicles operating on diesel.

The Department agrees that there is a need for the development of a diesohol standard, primarily due to the availability of both diesel and alcohols, allowing for uncontrolled blending of diesohol to occur.

An industry standard would be a desirable path, but as stated in the Paper, being of a voluntary nature there is potential for operation outside any such agreement.

Regulating diesohol through existing State fuel quality regulations (*Environment Protection (Diesel and Petrol) Regulations 1999*), has the disadvantages outlined in the Paper. Such an approach would not be favoured by the Department unless there were compelling reasons for doing so.

Box 3. Introduce a Diesohol Fuel Quality Standard Under the Fuel Quality Standards Act 2000

The Department suggests development of an appropriate standard through the Fuel Quality Standards Act 2000 is the option that provides the strongest platform for the future development of the diesohol industry and increased use without leading to unacceptable emissions outcomes. The Paper details the advantages of this proposal.

Box 4. Acidity

The Department considers the regulation of acidity would be desirable given the possible impacts of high acidity from alcohols corroding fuel system components, and associated impacts on emission outcomes. Although not able to comment on the technical reasons for the recommended level, the maximum total acidity limit of 0.08 mg KOH/g is supported based on information provided in the Paper.

Box 5. Alcohol Quality and Content

The Department considers there should be a limit on alcohol content of 15 percent, for reasons outlined in the Paper. The use of oxygen content appears an appropriate parameter to regulate the alcohol content, however, as stated in the Paper, such a limit would need to be developed.

Box 6. Cetane

It has been noted that the cetane index calculation measures 'natural cetane' and does not take into consideration the potential influence of diesel ignition improvers. The use of cetane index calculation is not possible for diesohol because of the chemically different nature of diesohol. Therefore, access to a cetane engine or comparable method is required for the testing of cetane number in diesohol. The issue of cetane number measurement is currently being examined by Department of Environment and Heritage.

Due to the potential for lower cetane increasing oxides of nitrogen in vehicles using diesohol, the cetane parameter should be regulated.

The cetane number of diesohol should be regulated such that it is maintained as close to the cetane index (46 (min)) of the diesel used to blend the diesohol in order to minimise NOx emissions.

Box 7. Density

As higher density relates to higher aromatics and higher emission of particulates, setting a maximum limit on density as proposed appears to be appropriate. However, as there are operability concerns related to too low density, a minimum may need to be established rather than leaving open. The Department supports the density limits as proposed in the Paper.

Box 8. Lubricity

In considering the importance of maintaining lubricity for diesel engine performance, setting a lubricity standard of a maximum wear of 0.460mm at 60°C is supported.

Box 9. Polyaromatic Hydrocarbons

As the blending additives and alcohol used in diesohol contain no PAHs it appears appropriate to set a limit of 11% m/m, coming into effect from 1 January 2006. However, diesel used in blending should be required to meet the limit prior to blending of diesohol, resulting in diesohol having lower PAHs than diesel and hence lower PAH emissions. This is important as it furthers the emission reduction benefits of using diesohol.

Box 10. Storage Stability

Due to a lack of experience and technical knowledge in dealing with diesohol, the Department is not able to comment with regard to storage stability requirements. However, due to impacts on operability and hence emissions, the Department considers this an important issue to be resolved. The Department will be guided by industry and other stakeholder comments.

Box 11. Sulfur

The effects of sulfur on particulate levels are well established. As the blending additives and alcohol used in diesohol contain minimal sulfur, it appears appropriate to set a limit of for sulfur the same as diesel. However, diesel used in blending should be required to meet the limit prior to blending of diesohol, resulting in diesohol having lower sulfur than diesel and hence lower particulate emissions. This is important as it furthers the emission reduction benefits of using diesohol.

Box 12. Viscosity

There appears to be a requirement for a standard for viscosity, for the reasons of operability and emissions performance as outlined in the Paper. However, the Department is unable to comment on an appropriate limit.

Box 13. Water and Sediment

The water and sediment limit of 500 ppm, as per diesel, seems appropriate, provided water is defined as free water and does not consider water than is associated with the dispersed alcohol phase of the emulsion.

Box 14. Ash and Suspended Solids

The regulation of the diesel used to blend diesohol appears to be sufficient to regulate ash and suspended solids in diesohol.

Box 15. Carbon Residue

The regulation of the diesel used to blend diesohol appears to be sufficient to regulate carbon residue in diesohol.

Box 16. Conductivity

The regulation of the diesel used to blend diesohol appears to be sufficient to regulate the conductivity of diesohol.

Box 17. Copper Corrosion

The regulation of the diesel used to blend diesohol combined with the proposed acidity limit appears to be sufficient to regulate the copper corrosion of diesohol.

Box 18. Distillation

The regulation of other fuel parameters in diesohol and the fact that alcohol will not alter the distillation curve (as all the alcohol boils off at a single temperature), combined with the regulation of diesel used in blending, appear to remove the need for a distillation limit.

Box 19. Filter Blocking Tendency

The regulation of the diesel used to blend diesohol appears to be sufficient to regulate the filter blocking tendency of diesohol.

Box 20. Flash Point

The Department considers flash point does not require regulation as it does not impact on operability or emissions outcomes. The requirements for storage and handling of diesohol are addressed by following the same procedures as for petrol.