

State of California
AIR RESOURCES BOARD

Resolution 98-35

August 27, 1998

Agenda Item No.: 98-8-1

WHEREAS, sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (ARB or Board) to adopt standards, rules, and regulations and to do such acts as may be necessary for the proper execution of the powers and duties granted to, and imposed upon, the Board by law;

WHEREAS, Chapter 3.5 (commencing with section 39650) of Part 2 of Division 26 of the Health and Safety Code establishes procedures for the identification of toxic air contaminants (TACs) by the Board;

WHEREAS, section 39655 of the Health and Safety Code defines a “toxic air contaminant” as an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health;

WHEREAS, section 39662 of the Health and Safety Code directs the Board to list, by regulation, substances determined to be toxic air contaminants, and to specify for each substance listed a threshold exposure level, if any, below which no significant adverse health effects are anticipated;

WHEREAS, pursuant to the request of the Board, the Office of Environmental Health Hazard Assessment (OEHHA) evaluated the health effects associated with diesel exhaust in accordance with section 39660 of the Health and Safety Code;

WHEREAS, the OEHHA concluded that diesel exhaust is an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health because it is a potential human carcinogen;

WHEREAS, upon receipt of the OEHHA evaluation, the staff of the Board prepared a report including, and in consideration of, the OEHHA evaluation and recommendations and in the form required by section 39661 of the Health and Safety Code and, in accordance with the provisions of that section, made the report available to the public and submitted it for review to the Scientific Review Panel (SRP) established pursuant to section 39670 of the Health and Safety Code;

WHEREAS, in accordance with section 39661 of the Health and Safety Code, the SRP reviewed the staff report, including the scientific procedures and methods used to support the data in the report, the data itself, and the conclusions and assessments on which the report was based; the SRP considered the public comments received regarding the report; and on April 22, 1998, found the report to be based on sound science and adopted findings (Attachment A) for submittal to the Board;

WHEREAS, the SRP and the OEHHA, based on available scientific evidence, did not find an exposure level below which carcinogenic effects are not expected to occur;

WHEREAS, a number of adverse long-term non-cancer effects have been associated with exposure, including a greater incidence of cough, phlegm, and chronic bronchitis;

WHEREAS, more than 30 human epidemiological studies have investigated the potential carcinogenicity of diesel exhaust, and these studies are consistent with an association between long-term occupational exposure and lung cancer;

WHEREAS, other scientific agencies including the National Institute of Occupational Safety and Health and the International Agency for Research on Cancer (IARC) have determined that diesel exhaust is either a potential or probable human carcinogen based on animal and/or human evidence;

WHEREAS, diesel exhaust is a complex mixture of gases and fine particles emitted by a diesel-fueled internal combustion engine;

WHEREAS, the gaseous fraction contains volatile organic compound components, but is primarily composed of typical combustion gases such as nitrogen, oxygen, carbon dioxide, and water vapor. However, as a result of incomplete combustion, the gaseous fraction also contains air pollutants such as carbon monoxide, sulfur oxides, nitrogen oxides, and volatile organic compounds such as alkenes, aromatic hydrocarbons, aldehydes such as formaldehyde and 1,3-butadiene, and low-molecular weight polycyclic aromatic hydrocarbons (PAH) and PAH-derivatives;

WHEREAS, particulate and volatile organic compound emissions in diesel exhaust include over 40 substances that are listed by the U.S. Environmental Protection Agency (U.S. EPA) as hazardous air pollutants and by the ARB as toxic air contaminants, and fifteen of these substances are listed by the IARC as carcinogenic to humans, or as a probable or possible human carcinogen;

WHEREAS, the OEHHA concluded that based on human epidemiological data, and based on the 95 percent upper confidence limit, the estimated range of lifetime (70 year) excess lung cancer risk is 1.3×10^{-4} to 2.4×10^{-3} per microgram of particulate emissions in a cubic meter of air exposure;

WHEREAS, the results of a study, approved by the ARB Research Screening Committee on April 3, 1998, funded by the ARB at the University of California, Riverside, College of Engineering, Center for Environmental Research and Technology (CE-CERT) indicate that the diesel exhaust from reformulated diesel fuel tested contained the same toxic air constituents as diesel fuel used in the 1980's and early 1990's, although their concentrations may differ for some compounds;

WHEREAS, the methodology used by OEHHA and ARB staff for estimating the associated risk utilizes exposure to diesel particulate to estimate cancer risks;

WHEREAS, the scientific evidence indicates particulate matter and organic vapor phase emissions are the most likely contributors to adverse health effects from exposure to diesel exhaust;

WHEREAS, the unit risk values reported in this Resolution, the SRP findings, and related staff reports reflect exposures to emissions from historical diesel fuel formulations and engine technologies and, subsequent changes in diesel fuel formulations and engine technologies may have had an effect on the particle characteristics and chemical composition of diesel exhaust;

WHEREAS, the Board is sensitive to concerns voiced in testimony that guidance is needed to better clarify the components in diesel-fueled engine exhaust that may be responsible for creating a majority of the health risk, and recognition should be given to changes in diesel engine technology and fuel formulations that may reduce public exposure to harmful combustion constituents;

WHEREAS, organic vapor phase substances emitted by diesel-fueled engines have been listed as TACs or have and can be controlled as VOC emissions;

WHEREAS, particulate emissions from diesel-fueled engines, while currently subject to regulation, are not currently listed as a TAC;

WHEREAS, although the human studies on which the risk estimates were based involve exposure to whole diesel exhaust, listing particulate emissions from diesel-fueled engines is consistent with OEHHA's and the SRP's findings;

WHEREAS, the major sources of particulate emissions from diesel-fueled engines are on-road mobile sources which include heavy-duty trucks, buses, light-duty cars and trucks, all ubiquitous in this state and the country;

WHEREAS, many existing federal and state regulations already provide significant reductions in emissions from diesel-fueled vehicles including oxides of nitrogen, oxides of sulfur, and particulate matter. Particulate emissions emitted by on-road diesel-fueled mobile sources are expected to decline by approximately 60 percent from 1995 to 2010 as a result of mobile source regulations already adopted by the ARB;

WHEREAS, the unit risk values reported in this Resolution, the SRP findings and related staff reports reflect exposures to exhaust from historical diesel fuel formulations and engine technologies, and although people are exposed to emissions from new and old diesel engines, changes in diesel fuel formulations (e.g., the introduction of California reformulated diesel fuel in 1993) and engine technologies have significantly reduced mass emissions of particulate matter, oxides of sulfur, volatile organic compounds, carbon monoxide, and oxides of nitrogen. Additionally, these changes may have had an effect on the particulate characteristics and chemical composition of diesel exhaust. Therefore, the risk estimates should be updated as more information becomes available.

WHEREAS, the Board agrees with the SRP that research would be helpful to quantify the amounts of specific compounds emitted from a variety of engine technologies, operating cycles, and diesel fuel formulations to characterize better any differences between old and new diesel fuel formulations and engine technologies and to clarify further the health effects from exposure to particulate emissions from diesel-fueled engines and other potentially harmful emissions from diesel-fueled engines. The Health Effects Institute, with the participation of ARB, is in the process of initiating human health effects research to clarify health effects from exposure to emissions from diesel-fueled engines;

WHEREAS, the Board has approved three diesel-related research projects in the Planned Air Pollution Research for Fiscal Year 1998-1999 that will help characterize particulate emissions resulting from a variety of diesel-fueled engines, operating cycles, and fuel;

WHEREAS, in certain cases (e.g., stationary sources), air pollution control districts currently permit and otherwise regulate emissions from diesel-fueled engines;

WHEREAS, AB 1807 was enacted by the State of California in 1983 and requires that the ARB identify and control emissions of toxic air contaminants to reduce ambient levels of pollutants. Proposition 65 was approved by the citizens of California in 1986 and is a separate and distinct program from AB 1807. Proposition 65 requires warnings regarding exposure to significant risk levels from specific sources of Proposition 65 listed chemicals. Additionally, there may be separate civil actions or proceedings under statutory and common law that may be used to pursue claims for personal injuries or other damages. The Board is sensitive to concerns expressed in testimony that the Board's identification action could have indirect implications in terms of potential litigation.

WHEREAS, the Board recognizes that the transportation fleet which relies on diesel fuel in California contains intra-state and inter-state vehicles and fuel, and that a coordinated effort will be needed with the U.S. EPA, U.S. Department of Transportation, U.S. Department of Energy, and interested states;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project which may have adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available to reduce or eliminate such impacts; and,

WHEREAS, a public hearing and other administrative proceedings have been held in accordance with the provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of the Government Code.

NOW, THEREFORE, BE IT RESOLVED that the Board determines that it is appropriate to list particulate emissions from diesel-fueled engines as a TAC and further that it is resolved that the Board finds that existing authority related to already identified TACs or criteria pollutants can be utilized to consider any additional reductions that may be necessary in vapor organic gases.

BE IT FURTHER RESOLVED that the Board directs staff to begin the risk management process. That process should focus on control measures that may be needed as a consequence of listing particulate emissions from diesel-fueled engines as a toxic air contaminant and that also may be needed to reduce other potentially harmful pollutants from diesel-fueled engines. The staff is directed to form a diesel emissions risk management working group to advise the staff in connection with its risk management efforts.

BE IT FURTHER RESOLVED that the Board directs the staff during development of the needs assessment for further control to thoroughly evaluate the reduced exposures to particulate emissions from diesel-fueled engines resulting from full implementation of all existing regulations controlling diesel exhaust particulate matter.

BE IT FURTHER RESOLVED that the Board directs the staff, in conjunction with the OEHHA, to follow health studies with respect to diesel-fueled engines which are designed to further refine the quantification of health risks.

BE IT FURTHER RESOLVED that given the AB 1807 (AB 1807, Tanner, Chapter 1047, Statutes of 1983, Health & Safety Code Section 39650 et seq.) context in which the reported unit risk factors were derived, and given the potential that may arise for the use of the reported unit risk factors in the context of civil litigation, the Board finds that the proper courts must determine whether the use of the reported unit risk factors is appropriate for the specific sources, fuel formulations, engine technologies, and exposures at issue in any such litigation.

BE IT FURTHER RESOLVED that the Board directs the staff to develop risk management guidelines for use by the air pollution control districts in permitting and/or otherwise regulating emissions from certain diesel-fueled engines (e.g., stationary sources). The staff shall work closely with the air pollution control districts, affected industry, environmental groups and other interested parties to develop risk management guidelines and shall report within one year to the Board.

I hereby certify that the above is a true and correct copy of Resolution 98-35, as adopted by the Air Resources Board.

Pat Hutchens, Clerk of the Board

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Identification of Attachments to the Resolution

Attachment A: Scientific Review Panel Findings on *Proposed Identification of Diesel Exhaust as a Toxic Air Contaminant* with cover letter.

Attachment B: Proposed amendment to section 93000, Title 13, California Code of Regulations.