

State of California
AIR RESOURCES BOARD

Response to Significant Environmental Issues

Item: Public Hearing to Consider the Adoption of a Regulatory Amendment
Identifying Chloroform as a Toxic Air Contaminant

Agenda Item No.: 90-19-2

Public Hearing Date: December 13, 1990

Issuing Authority: Air Resources Board

Comment: No comments were received identifying any significant
environmental issues pertaining to this item. The staff report
identified no adverse environmental effects.

Response: N/A

Certified:

Patricia Hitchcock for
Judith M. Lounsbury
Board Secretary

Date:

3/22/91

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RESOURCES AGENCY OF CALIFORNIA

State of California
AIR RESOURCES BOARD

Resolution 90-75

December 13, 1990

Agenda Item No.: 90-19-2

WHEREAS, Sections 39600 and 39601 of the Health and Safety Code authorize the Air Resources Board (the "Board") to do such acts and to adopt such regulations as may be necessary for the proper execution of the powers and duties granted to, and imposed upon, the Board;

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 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, in California, chloroform is emitted from many activities including chlorination of swimming pools and drinking water, bleaching of pulp at pulp and paper mills, pharmaceutical manufacturing, laboratory usage, flouorocarbon 22 production, publicly owned treatment works, cooling towers, domestic use of laundry bleach, combustion of leaded gasoline, air stripping towers, perchloroethylene production and contamination of chlorinated products; and chloroform is not naturally removed or detoxified in the atmosphere at a rate that would significantly reduce the resulting public exposure;

WHEREAS, pursuant to the request of the Board, the Department of Health Services (DHS) evaluated the health effects of chloroform in accordance with Section 39660 of the Health and Safety Code;

WHEREAS, DHS concluded in its evaluation that chloroform is causally associated with cancer in humans; that health effects other than cancer are not expected to occur at existing or expected ambient levels of chloroform; that based on the upper 95 percent confidence limit of potency, the estimated range of lifetime (70 year) excess lung cancer mortality risk from continuous exposure to 1 part per-billion (ppb) of atmospheric chloroform is from 2.9×10^{-6} /ppb to 9.8×10^{-5} /ppb and that, based on available data, 2.6×10^{-5} /ppb is the most plausible estimate of the upper bound of the overall unit risk;

WHEREAS, based on the best estimate of 2.6×10^{-5} /ppb and a population weighted outside exposure of .03 ppb, the DHS staff estimates that the excess carcinogenic risk from a 70-year lifetime exposure to ambient outdoor chloroform to be approximately 1 case per million persons exposed;

WHEREAS, for the reasons set forth in its evaluation, DHS treats chloroform-induced carcinogenesis as a nonthreshold phenomenon because DHS found no evidence that there is a carcinogenic threshold level for chloroform;

WHEREAS, upon receipt of the DHS evaluation, staff of the Board prepared a report including and in consideration of the DHS 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, considered the public comments received regarding the report, and on August 14, 1990 adopted, for submittal to the Board, findings which include the following:

1. Chloroform has been identified as an animal carcinogen and should be regarded as a possible human carcinogen;
2. Chloroform is emitted into the air by a variety of stationary sources in California. It is emitted indoors and can give rise to concentrations that are greater than outdoor concentrations;
3. Based on its gas-phase reactivity with hydroxyl radicals, chloroform has an atmospheric lifetime estimated to range from 150 to 230 days;
4. Approximately 20 million people in California represented by the ARB toxics monitoring network (out of the 28 million total California population) are estimated to be exposed outdoors to a population-weighted mean chloroform concentration of 0.03 parts per billion (ppb);
5. Adverse health effects other than cancer are not known or expected to occur at predicted concentrations of chloroform in ambient outdoor air;
6. Based on available scientific information, a chloroform exposure level below which carcinogenic effects are not expected to occur cannot be identified with certainty;

7. Based on an interpretation of available scientific evidence, DHS staff estimated the range of unit risk (exposure to 1 ug/m (.21 ppb)) based on the upper 95% confidence limit is from 2.9×10^{-6} /ppb to 9.8×10^{-6} /ppb. Based on available data, 2.6×10^{-6} /ppb is the best estimate of potency as a unit risk. These upper bound excess lifetime risks are health protective estimates; the actual risk may well be below these values;
8. Inhalation exposure to a statewide mean ambient outdoor concentration (weighted by population) of 0.03 ppb for a population of 20 million people could result in up to 16 excess lifetime cancers, based on the DHS' best estimate for unit risk. Assuming that this applies to the California state population of 30 million, this could result in up to 24 excess lifetime cancers, based on the DHS' best estimate for unit risk;
9. Indoor inhalation exposures are greater than outdoor exposures and significantly contribute to risk beyond the estimated outdoor risk;
10. Chloroform in drinking water may contribute more to the overall risk from chloroform exposure than chloroform in ambient air. The risk from ingestion equals 3.5×10^{-6} . This corresponds to 35 excess cancer cases per 1 million people per lifetime based on average drinking water consumption; and
11. The numbers cited here are subject to a significant degree of uncertainty, because chloroform's mechanism of carcinogenicity has not been identified;

WHEREAS, the SRP found the staff report to be without serious deficiency, and the SRP agreed with the staff recommendation that chloroform should be listed by the Air Resources Board as a toxic air contaminant, and found that, based on available scientific information, the chloroform exposure level below which carcinogenic effects are not expected to occur cannot be identified;

WHEREAS, the California Environmental Quality Act and Board regulations require that no project having significant adverse environmental impacts be adopted as originally proposed if feasible alternatives or mitigation measures are available;

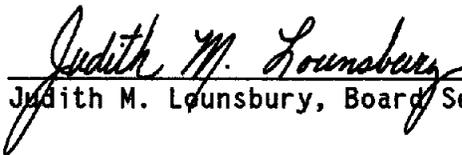
WHEREAS, a public hearing and other administrative proceedings have been held in accordance with provisions of Chapter 3.5 (commencing with Section 11340), Part 1, Division 3, Title 2 of Government Code;

WHEREAS, in consideration of the staff report, including DHS' evaluation and recommendations, the available evidence, the findings of the SRP, and the written comments and public testimony it has received, the Board finds that:

1. Chloroform has been identified as an animal carcinogen and should be regarded as a possible human carcinogen;
2. Health effects other than cancer are not anticipated at existing or expected chloroform exposure levels in ambient outdoor air;
3. Indoor air exposures range from outdoor levels up to approximately ten times greater than that of outdoor exposures;
4. The DHS and the SRP agree that the most plausible estimate of the upper bound of the overall unit risk is 2.6×10^{-5} /ppb;
5. Chloroform is an air pollutant which, because of its carcinogenicity, 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 and is therefore a toxic air contaminant;
6. There is not sufficient available scientific evidence to support the identification of a threshold exposure level for chloroform; and
7. Pursuant to the requirements of the California Environmental Quality Act and Board regulations, this regulatory action will have no significant adverse impact on the environment.

NOW, THEREFORE BE IT RESOLVED, that the Board hereby identifies chloroform as a toxic air contaminant and adopts the proposed regulatory amendment to Section 93000, Titles 17 and 26, California Code of Regulations, as set forth in Attachment A.

I hereby certify that the above is a true and correct copy of Resolution 90-75, as adopted by the Air Resources Board.



Judith M. Lounsbury, Board Secretary