

**OCCUPATIONAL SAFETY
AND HEALTH STANDARDS BOARD**

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Attachment No. 2

INITIAL STATEMENT OF REASONS**CALIFORNIA CODE OF REGULATIONS**

Title 8, Section 5155 of the General Industry Safety Orders

Airborne Contaminants: Hydrogen Chloride (HCl)**SUMMARY**

Labor Code, Section 144.6 requires that the Occupational Safety and Health Standards Board (Standards Board), when dealing with standards for toxic materials and harmful physical agents, adopt standards which most adequately assure, to the extent feasible, that no employee suffer material impairment of health or functional capacity even if such employee has regular exposure to the hazard for the period of their working lifetime. This section also requires that the Standards Board base standards on research, demonstrations, experiments and other information as may be appropriate. Labor Code, Section 144.6 also lists other considerations such as the latest scientific literature, the reasonableness of the standards, and experience gained under this and other health and safety laws.

Existing Section 5155 establishes minimum requirements for controlling employee exposure to specific airborne contaminants. This section specifies several types of airborne exposure limits, including limits on exposures as an 8-hour time-weighted average (TWA), short term exposure limits (STELs), and ceiling limits. Section 5155 also requires that, for specified substances that may be absorbed into the bloodstream through the skin, mucous membranes or the eye, appropriate clothing be provided for and used by employees as necessary to prevent skin absorption. Section 5155 also contains requirements for measurement of workplace airborne exposures and, in certain situations, medical surveillance.

On an ongoing basis with the assistance of an advisory committee, the Division of Occupational Safety and Health (Division) develops proposals to amend these airborne exposure limits known as Permissible Exposure Limits (PELs). This ongoing review is necessary to take into account changes in the information available to assess the health effects of exposures to airborne substances that can be present in the workplace.

The Standards Board is proposing for HCl to reduce the existing PEL Ceiling value to 2 parts per million (ppm), and to reduce the 8-hour TWA PEL from 5 ppm to 0.3 ppm.

This proposal was developed by the Division pursuant to its mandate in Labor Code Section 147.1 to maintain surveillance and propose standards to the Standards Board. The Division relies in part on changes made to the Threshold Limit Values (TLVs) published by the American Conference of Governmental Industrial Hygienists (ACGIH) to indicate substances with PELs to be considered for revision. The TLV for hydrogen chloride was last revised in 2003.

The Division, in developing this and past proposals for amendments to Section 5155, has convened advisory committees to consider and make recommendations on the substances in the base list. These advisory committees assist the Division in evaluating and interpreting the studies and other scientific information listed in the Documents Relied Upon section that form the factual basis of proposals for revisions to Section 5155. The advisory committees for PELs also provide an additional avenue for involvement in the rulemaking process by employers and worker representatives, and by other communities that can be affected by revisions to Section 5155.

The health basis of the PEL for hydrogen chloride was taken up by the Division's Health Expert Advisory Committee (HEAC) for PELs at five meetings in 2008 and 2009, with the final discussion on September 10, 2009. With assistance from the Office of Environmental Health Hazard Assessment (OEHHA) and the Hazard Evaluation System and Information Service, the HEAC discussed scientific information on both cancer and non-cancer risks presented by exposures to hydrogen chloride. After the HEAC discussions concluded, feasibility and cost issues were taken up at a meeting of the Division's Feasibility Advisory Committee (FAC) held on December 8, 2009. Minutes of the HEAC and FAC meetings are posted on the Internet. The website address for 2009-2010 meetings is http://www.dir.ca.gov/dosh/DoshReg/5155Meetings_2009.htm. The website address for 2007-2008 meetings is <http://www.dir.ca.gov/dosh/DoshReg/5155Meetings.htm>.

SPECIFIC PURPOSE AND FACTUAL BASIS OF THE PROPOSED ACTION

This regulatory proposal is intended to provide worker safety at places of employment in California.

The proposed rulemaking action:

- Is based on the following authority and reference: Labor Code Section 142.3, which states, at subsection (a)(1) that the Board is "the only agency in the state authorized to adopt occupational safety and health standards." When read in its entirety, Section 142.3 requires that California have a system of occupational safety and health regulations that at least mirror the equivalent federal regulations and that may be more protective of worker health and safety than are the federal occupational safety and health regulations.

- Differs from existing federal standards, in that the PEL Ceiling value proposed for HCl is lower than that found in the federal air contaminants standard at 29 CFR 1910.1000, and that federal standard also does not include an 8-hour TWA value as is being proposed in this rulemaking. Labor Code section 147.1(c) mandates with respect to occupational health issues not covered by federal standards that the Division maintain surveillance, determine the necessity for standards, and develop and present proposed standards to the Standards Board. For a variety of reasons, the federal standards for air contaminants have remained largely unrevised since their promulgation in the early 1970s, with the exception of substances for which individual comprehensive chemical hazard control standards have been promulgated, primarily for carcinogens. Since the federal standards were promulgated over 40 years ago, scientific studies with experimental animals have shown that HCl has the potential to cause acute and chronic health effects. The Standards Board believes the Division appropriately carried out its mandate under Labor Code section 147.1 to present to the Standards Board the PEL proposed for HCl in this rulemaking, including a determination of necessity for the proposed amendment. In addition, the Standards Board believes that with this proposal, it is carrying out its mandate under Labor Code section 144.6 to adopt standards dealing with toxic materials which most adequately assure, to the extent feasible, that no employee will suffer material impairment of health or functional capacity, taking into account the latest available scientific data in the field and the reasonableness of the standard.
- Is not inconsistent or incompatible with existing state regulations. This proposal is part of a system of occupational safety and health regulations. The consistency and compatibility of that system's component regulations is provided by such things as the requirement of the federal government and the Labor Code to the effect that the State regulations be at least as effective as their federal counterparts.
- This rulemaking proposal was developed with the assistance of two technical advisory committees: one that considered scientific data on health risks associated with exposure to HCl, and a second that considered concerns of cost and feasibility of implementation in the workplace. These committees were comprised of subject matter experts with expertise relevant to the concerns they were considering and from a range of different institutional orientations most notably health and chemical exposure science, industry, medicine, and government. The PEL amendments proposed are performance based and thus is consistent with the preference stated for this type of standard in Labor Code section 144.6 when dealing with toxic materials.

An amended Permissible Exposure Limit for hydrogen chloride is proposed to consist of the following: Reducing the existing Ceiling limit PEL value to 2 ppm and reducing the 8-hour TWA PEL value from 5 ppm to 0.3 ppm which is also expressed as the equivalent concentration in 0.45 mg/M³ based on the physical conditions listed in footnotes (e) and (f) of Table AC-1 in Section 5155.

In addition, it is proposed to delete the term “muriatic acid” because it is a non-systematic chemical term that does not represent precisely what the PEL is intended to address. The OSHA PEL for hydrogen chloride does not include reference to “muriatic acid.”

Hydrogen chloride is used in a number of industrial processes including electroplating, chemical synthesis, and cleaning of metal, masonry, and other materials. It is also widely used as a laboratory reagent.

The proposed PEL Ceiling limit of 2 ppm is based on the same rationale as the TLV Ceiling value of 2 ppm adopted by ACGIH in 2003. The 2003 TLV was adopted to minimize acute irritation of the eyes, mucous membranes and skin, based on the findings of Stevens et al. (1992) of a level of exposure in young asthmatic subjects that showed no adverse respiratory health effects. The Stevens et al. (1992) study is the basis for the OEHHA 1-hour acute Reference Exposure Level (A-REL) of 1.4 ppm current at the time of this rulemaking.

An 8-hour TWA PEL value of 0.3 ppm is proposed for HCl to address findings of laryngeal hyperplasia in rats exposed to 10 ppm HCl for 6 hours per day, 5 days per week, from 9 weeks of age for the remainder of their lives in the study of Sellakumar et al. (1985). The results of the Sellakumar et al. study are cited by OEHHA as the basis for its chronic Reference Exposure Level (REL) value current at the time of this rulemaking. The U.S. EPA also cited this study as the basis for its Reference Concentration for Chronic Inhalation Exposure (RfC) for hydrogen chloride. As discussed in the HEAC, the proposed TWA PEL value of 0.3 ppm is derived using the 10 ppm value of the Sellakumar et al. (1985) study as a Lowest Observed Adverse Effect Level (LOAEL) and dividing by factors of 3 for LOAEL to NOAEL (No Observed Adverse Effect Level) uncertainty, 3 for interspecies uncertainty, and 3 for intraspecies uncertainty.

The PEL for hydrogen chloride proposed in this rulemaking is generally consistent with the discussion in the FAC meeting of December 8, 2009. However, the FAC recommended a ceiling limit rather than a 15-minute Short Term Exposure Limit (STEL) value. The Division concurred with the FAC recommendation based on the ability to sample down to the new Ceiling level using the current OSHA sampling and analytical method which is capable of reliably detecting to a fraction of the proposed 2 ppm PEL Ceiling value in a 1-minute air sample.

DOCUMENTS RELIED UPON

1. American Conference of Governmental Industrial Hygienists. Threshold Limit Value for Hydrogen Chloride. 2003
2. Stevens B., et al.: Respiratory Effects from the Inhalation of Hydrogen Chloride in Young Adult Asthmatics. Journal of Occupational Medicine, 34(9):923–929. 1992.
3. Office of Environmental Health Hazard Assessment, California Environmental Protection Agency. Air Toxics "Hot Spots" Program Risk Assessment Guidelines Part I: Technical

Support Document for The Determination of Acute Reference Exposure Levels for Airborne Toxicants [March 1999]. Pages C-146 - 153. <http://www.oehha.ca.gov/air/pdf/acuted-1.pdf>

4. Sellakumar, A. R., et al. Carcinogenicity of Formaldehyde and Hydrogen Chloride in Rats. *Toxicology and Applied Pharmacology*. 81: 401-406. 1985.
5. Office of Environmental Health Hazard Assessment, California Environmental Protection Agency. Determination of Noncancer Chronic Reference Exposure Levels. Hydrogen Chloride. March 2000. Pages 309 - 312. http://www.oehha.ca.gov/air/hot_spots/rels_dec2008.html
6. Draft Meeting Summary of the HEAC on January 29, 2008, with a list of Members, Assisting Agencies, and Interested Parties.
7. Draft Meeting Summary of the HEAC on December 16, 2008, with a list of Members, Assisting Agencies, and Interested Parties.
8. Draft Meeting Summary of the HEAC on March 25, 2009, with a list of Members, Assisting Agencies, and Interested Parties.
9. Draft Meeting Summary of the HEAC on June 24, 2009, with a list of Members, Assisting Agencies, and Interested Parties.
10. Draft Meeting Summary of the HEAC on September 10, 2009, with a list of Members, Assisting Agencies, and Interested Parties.
11. Meeting Summary of the FAC on December 8, 2009, with a list of Members, Assisting Agencies, and Interested Parties.

These documents are available for review Monday through Friday from 8:00 a.m. to 4:30 p.m. at the Standards Board Office located at 2520 Venture Oaks Way, Suite 350, Sacramento, California.

DOCUMENTS INCORPORATED BY REFERENCE

None.

REASONABLE ALTERNATIVES THAT WOULD LESSEN ADVERSE ECONOMIC IMPACT ON SMALL BUSINESSES

No reasonable alternatives were identified by the Standards Board and no reasonable alternatives identified by the Standards Board or otherwise brought to its attention would lessen the impact on small businesses.

SPECIFIC TECHNOLOGY OR EQUIPMENT

This proposal will not mandate the use of specific technologies and equipment.

COST ESTIMATES OF PROPOSED ACTION

This rulemaking proposes to amend the existing Permissible Exposure Limit (PEL) for hydrogen chloride (HCl) in workplace air. Employers with workplaces where there may be worker exposures to HCl in California operate primarily in the private industrial and chemical sectors. The proposed PEL Ceiling for HCl is the same as the ACGIH TLV Ceiling value adopted in 2003 and so professional health and safety staff and consultants of affected employers should be aware of, and are probably already in compliance with, this value at most California workplaces.

The 8-hour TWA PEL value being proposed is based on scientific findings of which professional health and safety staff and consultants should be cognizant as it is based on the same study as that on which OEHHA bases its current chronic REL value for hydrogen chloride and on which the U.S. Environmental Protection Agency bases its Reference Concentration for Chronic Inhalation Exposure (RfC).

The only written comment on HCl received from an interested party for the FAC meeting was a letter from WorkSafe addressing three substances discussed in this FAC meeting, which noted briefly that HCl is used in a wide variety of cleaning applications and that there are many relatively non-toxic cleaning products and processes that may substitute for many of the uses of HCl. No other comments on cost or feasibility were provided to the FAC meeting and the FAC discussion did not raise objection to the PEL amendments proposed in this rulemaking. In addition, the Division contacted affected industry representatives, reviewed past inspection data and relevant literature. Based on the FAC recommendations and the Division's additional research, it is not anticipated that the reduced PEL will create a significant cost impact on the employers who use HCl in California.

The Board does not believe there are significant costs associated with this regulatory proposal. The Board also believes any possible unforeseen costs would be offset by the potential savings associated with limiting exposures to HCl to the PEL values proposed resulting in reduced Workers Compensation and other costs associated with the health effects intended to be prevented or minimized.

Costs or Savings to State Agencies

No costs or savings to state agencies will result as a consequence of the proposed action.

Impact on Housing Costs

The Standards Board has made an initial determination that this proposal will not significantly affect housing costs.

Economic Impact Analysis

The Standards Board has made a determination that this proposal will not result in a significant, statewide adverse economic impact directly affecting businesses, including the ability of California businesses to compete with businesses in other states.

For the FAC meeting at which HCl was discussed, a brief written comment was submitted by WorkSafe suggesting that less toxic alternatives exist for some uses of this chemical. The FAC generally concluded on a consensus basis that the PEL amendments proposed in this rulemaking should not pose problems of feasibility and the Division's further research concurs.

In light of the limited economic impact of the proposal (as a result of the FAC feasibility determination and Division further research), the adoption of the proposed amendments to these standards will neither create nor eliminate jobs in the State of California nor result in the elimination of existing businesses or create or expand businesses in the State of California.

This regulatory proposal is intended to provide worker safety at places of employment in California.

Cost Impact on Private Persons or Businesses

The Standards Board is not aware of any cost impact that a representative private person or business would necessarily incur in reasonable compliance with the proposed action.

Costs or Savings in Federal Funding to the State

The proposal will not result in costs or savings in federal funding to the state.

Costs or Savings to Local Agencies or School Districts Required to be Reimbursed

No costs to local agencies or school districts are required to be reimbursed. See explanation under "Determination of Mandate."

Other Nondiscretionary Costs or Savings Imposed on Local Agencies

This proposal does not impose nondiscretionary costs or savings on local agencies.

DETERMINATION OF MANDATE

The Occupational Safety and Health Standards Board has determined that the proposed standard does not impose a local mandate. There are no costs to any local government or school district which must be reimbursed in accordance with Government Code Sections 17500 through 17630.

EFFECT ON SMALL BUSINESSES

The Standards Board has determined that the proposed amendments may affect small businesses. The feasibility and cost of implementation of the proposed PEL for HCl was discussed by the FAC. Based on the FAC committee discussion and its own research, the Division concluded that no information had been presented or discovered to suggest that the proposed amended Ceiling limit value nor the new 8-hour TWA PEL would be infeasible in any particular industrial sector or operation. In light of this, the Standards Board believes there will be no adverse economic impact on small businesses as a result of the PEL proposed for HCl.

RESULTS OF THE ECONOMIC IMPACT ASSESSMENT

The proposed regulation will not have any effect on the creation or elimination of California jobs or the creation or elimination of California businesses or affect the expansion of existing California businesses.

BENEFITS OF THE REGULATION

Setting a Permissible Exposure Limit for hydrogen chloride that is up-to-date and consistent with current scientific information and state policies on risk assessment will send appropriate market signals to employers with respect to the costs of illness and injury which chemicals can impose on workers and their families, the government, and society at large. With appropriate market signals, employers may be better able to choose chemicals for use in the workplace that impose less of a burden on workers and society.

ALTERNATIVES THAT WOULD AFFECT PRIVATE PERSONS

No reasonable alternatives have been identified by the Standards Board or have otherwise been identified and brought to its attention that would be more effective in carrying out the purpose for which the action is proposed, would be as effective and less burdensome to affected private persons than the proposed action, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provision of law.

Labor Code section 144.6 provides that standards dealing with toxic materials be adopted that

are most adequately protective of employee health “to the extent feasible.” Discussions were held in public meetings with advisory committees for both health and feasibility assessment. These discussions addressed a number of factors relevant to consideration of a particular value for the PEL proposed in this rulemaking. These discussions are described in the minutes included in Attachment No. 4. Labor Code section 144.6 also provides that whenever practicable, standards for toxic materials be expressed in terms of objective criteria and of the performance desired. The proposal in this rulemaking is consistent with that stated preference in that it does not require particular specified equipment or methods for exposure level control, but rather provides an objectively stated performance criteria with affected employers determining the alternatives to use to achieve compliance in their particular operations involving employee exposure to the toxic material. The preference of Labor Code section 144.6 for performance based standards for toxic materials is consistent with the same stated preference contained in such Government Code section 11340.1(a).