

## Rationale for Senate Bill 193 Application to 1-Bromopropane

*Prepared by the California Department of Public Health (CDPH), Hazard Evaluation System and Information Service (HESIS), in July 2017*

HESIS proposes to apply Senate Bill (SB) 193 authority to the solvent 1-bromopropane (1-BP), which is used primarily in workplaces as a degreaser (vapor, cold cleaning, and aerosol) and spray adhesive, among other applications. SB 193 (Chapter 830, Statutes of 2014, incorporated into Labor Code Section 147.2) authorizes HESIS to obtain California customer information from chemical manufacturers, formulators, suppliers, distributors, importers, and their agents, to enable HESIS to provide critical information to California employers and workers who may be exposed to toxic substances. The bill stipulates that this information must be provided to HESIS when *there is new scientific or medical information* and the Chief of HESIS determines that a substance *may be in use* in a place of employment, *may pose a hazard under a reasonable anticipated condition of use*, and *potentially poses a serious new or unrecognized health hazard to an employee*.<sup>1</sup> Additionally, CDPH has separate authority to gather information for investigations from Government Code 11180. This document summarizes how 1-BP meets both the legal criteria for exercising SB 193 authority and supporting criteria HESIS considered for selecting 1-BP. For a summary of 1-BP physical characteristics, industrial uses, health effects, regulatory history in California, and occupational exposure limits, please see the HESIS document, “1-Bromopropane Background.”

### **Criteria under SB 193**

**New scientific or medical information.** In terms of new hazard information, the National Toxicology Program (NTP) concluded in 2014 that 1-BP is “reasonably anticipated to be a human carcinogen” based on sufficient evidence for skin, lung, and large intestine tumors in rodents. In 2014, the American Conference of Governmental Industrial Hygienists (ACGIH) classified 1-BP carcinogenicity as A3, Confirmed Animal Carcinogen with Unknown Relevance to Humans. In 2016, California Environmental Protection Agency’s (EPA’s) Office of Environmental Health Hazard Assessment (OEHHA) listed the chemical as a carcinogen under Proposition 65, and the International Agency for Research on Cancer (IARC) classified 1-BP as “possibly carcinogenic to humans” (group 2B), based on “sufficient evidence of carcinogenicity in experimental animals.” The U.S. EPA and National Institute for Occupational Safety and Health (NIOSH) are likewise in the process of finalizing risk assessments of the carcinogenicity and other health hazards of 1-BP. NIOSH is developing a recommended exposure limit (REL) based on evidence of carcinogenicity.

In addition to recent findings of carcinogenicity, ACGIH concluded in 2014 that other adverse health outcomes, particularly neurologic, may occur at doses lower than previously appreciated. ACGIH adopted a revised Threshold Limit Value (TLV) of 0.1 ppm (reduced from 10 ppm). For comparison, the California Permissible Exposure Limit (PEL)

<sup>1</sup> See [https://leginfo.legislature.ca.gov/faces/billCompareClient.xhtml?bill\\_id=201320140SB193](https://leginfo.legislature.ca.gov/faces/billCompareClient.xhtml?bill_id=201320140SB193)

of 5 ppm became effective in 2010 and is the only existing regulatory occupational exposure limit in the nation.

**May pose a hazard under a reasonable anticipated condition of use.** The carcinogenic effects in experimental studies occurred at concentrations comparable to those measured during occupational exposure. 1-BP hazards thus arise under the “reasonable anticipated condition of use” specified under SB 193. The NIOSH REL being developed aims to prevent a 1/1000 excess working lifetime risk of lung cancer.

**Potentially poses a serious new or unrecognized health hazard.** The health hazards of 1-BP clearly are severe, given the potential for terminal illness compounded by multiple other organ system effects, and possible permanence of non-cancer health effects such as peripheral neuropathy. Other non-cancer health hazards include developmental toxicity; female and male reproductive toxicity; and hepatic and renal toxicity observed in animal studies. In 2013, the Occupational Safety and Health Administration (OSHA) and NIOSH produced a hazard alert on 1-BP. In light of the severity of potential disease, U.S. EPA in 2015 proposed adding 1-BP to the Toxics Release Inventory based on carcinogenicity and also received a petition requesting the addition of 1-BP to the list of hazardous air pollutants (HAP). These serious health effects may remain unrecognized by employers and employees.

**May be in use in a place(s) of employment in California.** U.S. EPA considers 1-BP to be a high production volume chemical (>15 million lbs in 2011) in the U.S. The California Environmental Reporting System (CERS, operated by California EPA) database confirms industrial use in California, mainly as a vapor degreaser and spray adhesive.

### ***Supporting Criteria***

In addition to confirming that the SB 193 criteria above are robustly fulfilled, HESIS considered several other pertinent factors in selecting 1-BP, as follows:

- The **information requested under SB 193 cannot be obtained through other means** since 1-BP is either not tracked by hazard databases or tracked only when stored in large quantities as in CERS. While HESIS could potentially identify businesses within an industry using commercial databases, this method cannot determine which businesses use 1-BP.
- **The PEL in California (5 ppm) may not be protective** for cancer or the reproductive and developmental endpoints on which it was originally based. Lower exposure limits have been adopted by ACGIH and are being developed by NIOSH.
- **1-BP use has increased.** This increase has occurred in part because 1-BP has been marketed as a substitute in the dry cleaning industry. The increase also follows the 2007 final US EPA Significant New Alternatives Program (SNAP) rule that lists 1-BP as a substitute for ozone-depleting substances when used as a solvent in metals and electronics cleaning.

- **Safer alternatives are available**, including aqueous-based products.
- Other state, federal, and international agencies have listed this substance as a **priority for consumer and worker protection**.
- Further information is **needed to better understand typical exposure conditions and work processes in California**. HESIS will incorporate new information into an outreach product(s) highlighting relevant interventions to reduce exposure for California workers.
- Information on extent of usage in California **could help estimate the degree of potential exposure reduction achieved by a lowered PEL**.

In summary, 1-BP meets SB 193 criteria of potentially posing a serious new or unrecognized health hazard to employees under reasonable conditions of use in California. The current scientific evidence of toxicity being reviewed by multiple authoritative bodies warrants an intervention to alert employers and workers of these health risks and provide further guidance on exposure control.