SCREENING-LEVEL HAZARD CHARACTERIZATION
1,2-Dibromoethane
(CASRN 106-93-4)

The High Production Volume (HPV) Challenge Program[1] was conceived as a voluntary initiative aimed at developing and making publicly available screening-level health and environmental effects information on chemicals manufactured in or imported into the United States in quantities greater than one million pounds per year. In the Challenge Program, producers and importers of HPV chemicals voluntarily sponsored chemicals; sponsorship entailed the identification and initial assessment of the adequacy of existing toxicity data/information, conducting new testing if adequate data did not exist, and making both new and existing data and information available to the public. Each complete data submission contains data on 18 internationally agreed to "SIDS" (Screening Information Data Set[1,2]) endpoints that are screening-level indicators of potential hazards (toxicity) for humans or the environment.

The Environmental Protection Agency's Office of Pollution Prevention and Toxics (OPPT) is evaluating the data submitted in the HPV Challenge Program on approximately 1400 sponsored chemicals by developing hazard characterizations (HCs). These HCs consist of an evaluation of the quality and completeness of the data set provided in the Challenge Program submissions. They are not intended to be definitive statements regarding the possibility of unreasonable risk of injury to health or the environment.

The evaluation is performed according to established EPA guidance[2,3] and is based primarily on hazard data provided by sponsors; however, in preparing the hazard characterization, EPA considered its own comments and public comments on the original submission as well as the sponsor's responses to comments and revisions made to the submission. In order to determine whether any new hazard information was developed since the time of the HPV submission, a search of the following databases was made from one year prior to the date of the HPV Challenge submission to the present: ChemID (to locate available data sources including Medline/PubMed, Toxline, HSDB, IRIS, NTP, ATSDR, IARC, EXTOXNET, EPA SRS, etc.), STN/CAS online databases (Registry file for locators, ChemAbs for toxicology data, RTECS, Merck, etc.) and Science Direct. OPPT's focus on these specific sources is based on their being of high quality, highly relevant to hazard characterization, and publicly available.

OPPT does not develop HCs for those HPV chemicals which have already been assessed internationally through the HPV program of the Organization for Economic Cooperation and Development (OECD) and for which Screening Initial Data Set (SIDS) Initial Assessment Reports (SIAR) and SIDS Initial Assessment Profiles (SIAP) are available. These documents are presented in an international forum that involves review and endorsement by governmental authorities around the world. OPPT is an active participant in these meetings and accepts these documents as reliable screening-level hazard assessments.

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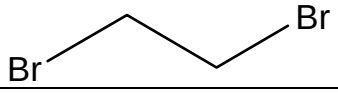
[1] U.S. EPA. High Production Volume (HPV) Challenge Program; http://www.epa.gov/chemrtk/index.htm.
[2] U.S. EPA. HPV Challenge Program – Information Sources; http://www.epa.gov/chemrtk/pubs/general/guidocs.htm.
[3] U.S. EPA. Risk Assessment Guidelines; http://cfpub.epa.gov/ncea/raf/rafguid.cfm.

These hazard characterizations are technical documents intended to inform subsequent decisions and actions by OPPT. Accordingly, the documents are not written with the goal of informing the general public. However, they do provide a vehicle for public access to a concise assessment of the raw technical data on HPV chemicals and provide information previously not readily available to the public.

Chemical Abstracts Service Registry Number (CASRN)	**106-93-4**
Chemical Abstracts Index Name	**Ethane, 1,2-dibromo**
Structural Formula	

Summary

This chemical is a colorless liquid with high water solubility and high vapor pressure. This chemical is expected to have high mobility in soil. This chemical did not pass a ready biodegradation test (OECD 301C); however, it was shown to degrade at varying rates in soils under aerobic conditions. Persistence can vary greatly from soil to soil. In one laboratory screening study using 100 soils, half-lives were determined to range from 1.5 to 18 weeks. The rate of volatilization from water and moist soil is considered moderate based on its Henry's Law constant. The rate of uncatalyzed hydrolysis is considered negligible, but hydrolysis catalyzed by the presence of various natural substances (such as HS ion) may be competitive with biodegradation (half-life of 1-2 months). This chemical is expected to have moderate persistence (P2) and low bioaccumulation potential (B1).

Acute oral toxicity to rats is moderate and to rabbits is high. Acute dermal toxicity to rabbits and acute inhalation toxicity to rats is moderate. CASRN 106-93-4 is irritating to skin and eyes. In chronic inhalation bioassays with rats and mice, the noncancer effects observed included testicular and adrenal cortex degeneration, retinal atrophy and hepatic necrosis (rats) or mortality, inflammation/cellular abnormalities in the respiratory tract and hepatic necrosis (mice) at 0.077 mg/L; NOAELs for systemic toxicity were not established. Repeated inhalation of this chemical resulted in fatty degeneration in the liver of monkeys at 0.38 mg/L, mortality in guinea pigs at 0.19 mg/L and no effects in rabbits at 0.38 mg/L (highest dose tested); the NOAEL for systemic toxicity was 0.19 mg/L, not established and0.38 mg/L in monkeys, guinea pigs and rabbits, respectively. Noncancer effects after repeated oral exposures included hepatitis/liver inflammation, adrenal cortex degeneration and testicular atrophy at 38 mg/kg-bw/day (rats) and mortality (mice) at 62 mg/kg-bw/day; NOAELs for systemic toxicity were not established. A reproductive toxicity study in rats via inhalation resulted in effects on male and female reproductive organs, fewer matings and changes in estrous cycles at 0.61 mg/L; the NOAEL for reproductive toxicity was 0.30 mg/L. Human epidemiological studies suggest that CASRN 106-93-4 is associated with male reproductive toxicity. In prenatal inhalation developmental toxicity studies in rats and mice, maternal toxicity (decreased body weight in rats and mortality in mice) was seen at 0.29 mg/L. In these developmental studies, fewer viable fetuses and increased resorptions were seen at 0.29 mg/L in rats, and skeletal anomalies, resorptions and decreased fetal body weights were seen at 0.15 mg/L in mice. In rats, the NOAEL for maternal and developmental toxicity was 0.15 mg/L. In mice, the NOAEL for maternal toxicity was 0.15 mg/L and for developmental toxicity was not established. CASRN 106-93-4 induced gene mutations and chromosomal aberrations *in vitro*; induced micronuclei *in vivo* in mice via inhalation, but did not induce dominant lethal mutations *in vivo*. Increased DNA adducts have been observed *in vivo* and humans have shown increased chromosomal exchanges after exposure

to this chemical. CASRN 106-93-4 was carcinogenic in rats and mice via the inhalation and oral routes; human epidemiological studies on carcinogenicity are inconclusive.

The 96-hour LC_{50}s of CASRN 106-93-4 to fish ranged from 136 to 991 mg/L. The predicted 48-hour EC_{50} of CASRN 106-93-4 to aquatic invertebrates is 82 mg/L, and the predicted 96-hour EC_{50} of CASRN 106-93-4 to aquatic plants is 35.4 mg/L.

A data gap for toxicity to aquatic plants was identified under the HPV Challenge Program.

The sponsor, Great Lakes Chemical Corporation, submitted a Test Plan and Robust Summaries to EPA for CASRN 106-93-4 (CASRN 106-93-4; CA Index Name: ethane, 1,2-dibromo-) on December 28, 2001. EPA posted the submission on the ChemRTK HPV Challenge website on February 5, 2002 (http://www.epa.gov/oppt/chemrtk/pubs/summaries/ethanedi/c13454tc.htm). EPA comments on the original submission were posted to the website on October 10, 2002. Public comments were also received and posted to the website.

1 Chemical Identity

1.1 Identification and Purity

It should be noted that although one of the common synonyms for CASRN 106-93-4 is ethylene dibromide (EDB), there are no double bonds in the compound's structure.

No information on percent purity was provided in the industry sponsor's submission.

1.2 Physical-Chemical Properties

The physical-chemical properties of CASRN 106-93-4 are summarized in Table 1. CASRN 106-93-4 is a colorless liquid with high water solubility and high vapor pressure.

Table 1. Physical-Chemical Properties of 1,2-Dibromoethane[1]

Property	**Value**
CASRN	106-93-4
Molecular Weight	187.9
Physical State	Colorless liquid[2]
Melting Point	**9.3–9.8 °C**
Boiling Point	**131–131.4 °C**
Vapor Pressure	**11.7 mm Hg at 25 °C;** **14.7 mm Hg at 20 °C;** **23.2 mm Hg at 30 °C**
Water Solubility	**4,030 mg/L at 20 °C;** **4,300 mg/L at 30 °C**
Dissociation Constant (pK_a)	Not applicable
Henry's Law Constant	**6.5×10^{-4} atm-m^3/mole[2]**
Log K_{ow}	**1.93–2.13**

Bold = measured data; (e) = estimated data (i.e., derived from modeling)

[1]Great Lakes Chemical Corporation. December 18, 2001. Robust Summary and Test Plan for Ethane, 1,2-Di-bromo. http://www.epa.gov/chemrtk/pubs/summaries/ethanedi/c13454tc.htm.

[2]HSDB. 2008. Hazardous Substances Data Bank. Accessed October 10, 2008. http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB.

2 General Information on Exposure

2.1 Production Volume and Use Pattern

Non-confidential information in the IUR indicated that the industrial processing and uses of the chemical include "other" for incorporation into formulation, mixture, or reaction product in petroleum refineries. Non-confidential information in the IUR indicated that the commercial and consumer products containing the chemical include lubricants, greases, and fuel additives. The HSDB for this chemical states that the chemical is primarily used as an exhaust system scavenger in gasoline containing lead, as a catalyst, a chemical intermediate, a fumigant, insecticide, and as a solvent for resins, gums and waxes.

2.2 Environmental Exposure and Fate

Total releases from all sites reported to U.S. EPA's Toxics Release Inventory (TRI) in 2006 were 10,558 pounds (3,783 pounds to air from on-site fugitive and point sources; 6,594 pounds as on-site releases to water). Most of the remaining volume of release was injected to deep wells or sent to off-site landfills.

The environmental fate properties are provided in Table 2. CASRN 106-93-4 is expected to have high mobility in soil. CASRN 106-93-4 did not pass a ready biodegradation test (OECD 301C); however, it was shown to degrade at varying rates in soils under aerobic conditions. Persistence can vary greatly from soil to soil. In one laboratory screening study using 100 soils, half-lives were determined to range from 1.5 to 18 weeks. The rate of volatilization from water and moist soil is considered moderate based on its Henry's Law constant. The rate of uncatalyzed hydrolysis is considered negligible, but hydrolysis catalyzed by the presence of various natural substances (such as HS ion) may be competitive with biodegradation (half-life of 1-2 months). CASRN 106-93-4 is expected to have moderate persistence (P2) and low bioaccumulation potential (B1).

Table 2. Environmental Fate Characteristics of 1,2-Dibromoethane[1]	
Property	**Value**
Photodegradation Half-life	>1 month (e); 64 days (e)[2]
Hydrolysis Half-life	**0–13% degraded at pH 5-9 and 25°C after 140 days;** **8–13 years at pH 7 and 20°C[2]** **1- 2 months catalyzed by HS^- [6]**
Biodegradation	**Half-life of <2 days in soil (aerobic) at 100 mg/kg[2];** **Half-life of 1.5 to 18 weeks in soil[2];** **0% in 14 days (not readily biodegradable)[3]** **Degraded in soil rapidly at ppb level; degraded slowly at the ppm level;**
Bioconcentration	**BCF = 1.6–3.2 (carp; 150 ppb)[3];** **BCF = <3.5–14.9 (carp; 15 ppb)[3]**
Log K_{oc}	1.6 (e)[2]
Fugacity (Level III Model)[4]	Air = 27.1% Water = 32.1% Soil = 40.7% Sediment = 0.11% (e)
Persistence[5]	P2 (moderate)
Bioaccumulation[5]	B1 (low)

Bold = measured data; (e) = estimated data (i.e., derived from modeling)

[1]Great Lakes Chemical Corporation. December 18, 2001. Robust Summary and Test Plan for Ethane, 1,2-Dibromo. http://www.epa.gov/chemrtk/pubs/summaries/ethanedi/c13454tc.htm.

[2]HSDB. 2008. Hazardous Substances Data Bank. Accessed October 10, 2008. http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB.

[3]National Institute of Technology and Evaluation. 2002. Biodegradation and Bioaccumulation of the Existing Chemical Substances under the Chemical Substances Control Law. http://www.safe.nite.go.jp/english/kizon/KIZON_start_hazkizon.html.

[4]U.S. EPA. 2008. Estimation Programs Interface Suite™ for Microsoft® Windows, v 3.20. United States Environmental Protection Agency, Washington, DC, USA. http://www.epa.gov/opptintr/exposure/pubs/episuite.htm.

[5]Federal Register. 1999. Category for Persistent, Bioaccumulative, and Toxic New Chemical Substances. *Federal Register* 64, Number 213 (November 4, 1999) pp. 60194–60204.

[6]EDB Fact Sheet EPA Office of Water : http://www.epa.gov/safewater/dwh/t-soc/edb.html

3. Human Health Effects

A summary of health effects data submitted for SIDS endpoints is provided in the conclusion below and Table 3. Most data are contained in the IRIS assessment (http://www.epa.gov/iris/) and are not described in detail below. However, selected studies submitted by the industry sponsor or available from ATSDR, NTP, HSDB and TSCATS are summarized below.

Acute Oral Toxicity

(1) Fischer 344 rats (6/sex/dose) were administered CASRN 106-93-4 via gavage at 40, 80, 130 (male only), 160 or 320 mg/kg-bw and observed for 2 weeks following dosing. Mortalities were observed in both females and males at all doses > 80 mg/kg-bw. Four of six males died at 130

mg/kg-bw, 6/6 males and 5/6 females died at 160 mg/kg-bw and all animals died at the highest dose. All deaths occurred within 6 days of dosing (TSCATS – OTS0536392 - http://www.syrres.com/esc/tscats.htm).
LD_{50} (male) = 116 mg/kg-bw
LD_{50} (female) = 133 mg/kg-bw

(2) Albino rats of both sexes (10-20/dose) were administered CASRN 106-93-4 (vehicle: olive oil) via gastric intubation at six different single doses. After exposure, they were observed until they recovered from weight loss and gained weight normally, typically a period of two weeks.
LD_{50} = 140 mg/kg-bw

(3) Rabbits (1/dose; strain not specified) were administered CASRN 106-93-4 via the oral route at 20, 25, 30, 50, 100, 250, 500, 1000, 2000 and 3500 mg/kg-bw and were observed for mortality and clinical signs (number of days not stated). All animals dosed with 50 mg/kg-bw and greater died within two days. The other animals survived for the duration of the study. (TSCATS – OTS0516127 - http://www.syrres.com/esc/tscats.htm).
30 < LD_{50} < 50 mg/kg-bw

(4) Several species [mouse (20 females), albino rat (60 males/40 females), guinea pig (40 animals of both sexes) and rabbit (55 females)] were administered single oral doses CASRN 106-93-4 (vehicle: olive oil) via gastric intubation. After exposure, they were observed until they recovered from weight loss and gained weight normally, typically a period of two weeks.
LD_{50} (male rat) = 146 mg/kg-bw
LD_{50} (female rat) = 117 mg/kg-bw
LD_{50} (female mouse) = 420 mg/kg-bw
LD_{50} (female rabbit) = 55 mg/kg-bw
LD_{50} (guinea pig) = 110 mg/kg-bw

Acute Inhalation Toxicity

Rats, guinea pigs and rabbits were exposed to CASRN 106-93-4 at 100 to 10,000 ppm (approximately 0.77 to 77 mg/L; rats at eight concentrations and guinea pigs at two concentrations) for varying exposure durations of 0.02 - 16 hours. The number of animals (both sexes) varied depending on the exposure duration and concentration being tested. Two control populations were used: air-exposed and unexposed. The animals were observed for approximately 2 weeks post exposure. LC_{50} values for guinea pigs and rabbits were not determined. This summary was supplemented with information from the ATSDR *Toxicological Profile* for 1,2,-dibromoethane (http://www.atsdr.cdc.gov/toxpro2.htm).
LC_{50} (rats; 2-h) ~ 3.08 mg/L

Acute Dermal Toxicity

(1) White rabbits (sex not specified) were treated with CASRN 106-93-4 via the dermal route at 210 (15 animals/dose) or 300, 650 and 1100 mg/kg-bw (5 animals/dose) under impervious sleeves and heavy cloth bandages for 24 hours and observed for 2 weeks following dosing. Numbers of mortalities were as follows: 1/15 at 210 mg/kg-bw, 2/5 at 300 mg/kg-bw, 4/5 at 650 mg/kg-bw and 5/5 at 1000 mg/kg-bw. All deaths occurred within 4 days of treatment. 1,2-

Diboromoethane resulted in moderate to severe erythema, edema and necrosis. An LD_{50} was not presented in the submitted summary.
$300 < LD_{50} < 650$ mg/kg-bw

(2) Rabbits (1/dose; strain not specified) were administered a single application of CASRN 106-93-4 via the dermal route at 300, 430, 480, 750, 1090 or 2000 mg/kg-bw under unspecified conditions for an unspecified amount of time. Mortalities were observed at the two highest doses within two days of administration (TSCATS – OTS0516127 – http://www.syrres.com/esc/tscats.htm).
$750 < LD_{50} < 1090$ mg/kg-bw

Genetic Toxicity – Chromosomal Aberrations

In vivo
In an NTP study, B6C3F1 mice (10 males/concentration) were exposed to CASRN 106-93-4 via inhalation at 10, 20 or 50 ppm (approximately 0.077, 0.15 and 0.38 mg/L, respectively) for 25 weeks. Peripheral blood samples were evaluated for incidence of micronuclei. A negative control responded appropriately. Although a positive control was not tested, positive control slides were included to control for staining and scoring procedures (http://ntp-apps.niehs.nih.gov/ntp_tox/index.cfm?fuseaction=ntpsearch.searchhome).
CASRN 106-93-4 induced micronuclei in this assay.

Additional Information

Skin irritation

CASRN 106-93-4 was irritating to the skin (species not stated) (http://toxnet.nlm.nih.gov/).

Eye irritation

CASRN 106-93-4 was irritating to eyes (species not stated) (http://toxnet.nlm.nih.gov/).

Conclusion: Acute oral toxicity to rats is moderate and to rabbits is high. Acute dermal toxicity to rabbits and acute inhalation toxicity to rats is moderate. CASRN 106-93-4 is irritating to skin and eyes. In chronic inhalation bioassays with rats and mice, the noncancer effects observed included testicular and adrenal cortex degeneration, retinal atrophy and hepatic necrosis (rats) or mortality, inflammation/cellular abnormalities in the respiratory tract and hepatic necrosis (mice) at 0.077 mg/L; NOAELs for systemic toxicity were not established. Repeated inhalation of this chemical resulted in fatty degeneration in the liver of monkeys at 0.38 mg/L, mortality in guinea pigs at 0.19 mg/L and no effects in rabbits at 0.38 mg/L (highest dose tested); the NOAEL for systemic toxicity was 0.19 mg/L, not established and 0.38 mg/L in monkeys, guinea pigs and rabbits, respectively. Noncancer effects after repeated oral exposures included hepatitis/liver inflammation, adrenal cortex degeneration and testicular atrophy at 38 mg/kg-bw/day (rats) and mortality (mice) at 62 mg/kg-bw/day; NOAELs for systemic toxicity were not established. A reproductive toxicity study in rats via inhalation resulted in effects on male and female reproductive organs, fewer matings and changes in estrous cycles at 0.61 mg/L; the NOAEL for

reproductive toxicity was 0.30 mg/L. Human epidemiological studies suggest that CASRN 106-93-4 is associated with male reproductive toxicity. In prenatal inhalation developmental toxicity studies in rats and mice, maternal toxicity (decreased body weight in rats and mortality in mice) was seen at 0.29 mg/L. In these developmental studies, fewer viable fetuses and increased resorptions were seen at 0.29 mg/L in rats, and skeletal anomalies, resorptions and decreased fetal body weights were seen at 0.15 mg/L in mice. In rats, the NOAEL for maternal and developmental toxicity was 0.15 mg/L. In mice, the NOAEL for maternal toxicity was 0.15 mg/L and for developmental toxicity was not established. CASRN 106-93-4 induced gene mutations and chromosomal aberrations *in vitro*; induced micronuclei *in vivo* in mice via inhalation, but did not induce dominant lethal mutations *in vivo*. Increased DNA adducts have been observed *in vivo* and humans have shown increased chromosomal exchanges after exposure to this chemical. CASRN 106-93-4 was carcinogenic in rats and mice via the inhalation and oral routes; human epidemiological studies on carcinogenicity are inconclusive.

4. Environmental Effects- Aquatic Toxicity

In addition to data submitted by the industry sponsor to EPA, information from the following data sources are summarized below:

(1) Holcombe, G.W., D.A. Benoit, D.E. Hammermeister, E.N. Leonard, and R.D. Johnson, 1995. Acute and Long-Term Effects of Nine Chemicals on the Japanese Medaka (Oryzias latipes). Ach. Environ. Contam. Toxicol. 28(3):287-297.

(2) Erickson, S.J., and A. E. Freeman 1978. Toxicity Screening of Fifteen Chlorinated and Brominated Compounds Using Four Species of Marine Phytoplankton In: R.L. Jolley, H. Gorchev, and D.H. Hamilton (Eds.), Water Chlorination: Environmental Impact and Health Effects, Ann Arbor Sci. Publ., Ann Arbor, MI 2:307-310.

(3) Trenel, J., and R. Kuhn, 1982. Bewertung Wassergefahrdender Stoffe im Hinblick auf Lagerung, Umschlag und Transport Umweltforschungsplan des Bundesministers des Innern (OECDG Data File).

(4) Davis, J.T., and W.S. Hardcastle, 1959. Biological Assay of Herbicides for Fish Toxicity Weeds 7:397-404.

Acute Toxicity to Fish

(1) Japanese Medaka (*Oryzias latipes*) were exposed to measured concentrations of CASRN 106-93-4 (dose range not stated) under flow-through conditions for 96 hours with analytical monitoring. The LC_{50} was 331 mg/L.
96-h LC_{50} = 331 mg/L

(2) Japanese Medaka (*Oryzias latipes*) were exposed to measured concentrations of CASRN 106-93-4 (dose range not stated) under flow-through conditions for 96 hours with analytical monitoring. The LC_{50} values ranged from 136 to 991 mg/L.
96-h LC_{50} = 136 - 991 mg/L

(3) Bluegill sunfish (*Lepomis macrochirus*) were exposed to CASRN 106-93-4 (dose range not stated) under static conditions for 48 hours. The LC_{50} values ranged from 18 to 25 mg/L.
48-h LC_{50} = 18 - 25 mg/L

Acute Toxicity to Aquatic Invertebrates

Water fleas (*Daphnia magna*) were exposed to CASRN 106-93-4 under static conditions for 28 hours. Mean measured concentrations and dose range were not reported.
24-h EC_{50} = 119 mg/L

A standard acute toxicity test for invertebrates was not provided for CASRN 106-93-4. A 48-hour EC_{50} for invertebrates, estimated by ECOSAR (v. 1.00a), was provided to evaluate the acute toxicity of CASRN 106-93-4.
48-h EC_{50} = 81.908 mg/L (ECOSAR v. 1.00a)

Toxicity to Aquatic Plants

Freshwater algae (*Scenedesmus subspicatus*) were exposed to CASRN 106-93-4 at nominal concentrations for seven days. No dose range was reported. An EC_{03} value of 266 mg/L was reported.
Chronic EC_{50} (proliferation) = 266 mg/L

A standard toxicity test for aquatic plants was not provided for CASRN 106-93-4. A 96-hour EC_{50} for aquatic plants, estimated by ECOSAR (v. 1.00a), was provided to evaluate the toxicity to aquatic plants of CASRN 106-93-4.
96-h EC_{50} = 35.4 mg/L (ECOSAR v. 1.00a)

Conclusion: The 96-hour LC_{50} of CASRN 106-93-4 to fish ranged from 136 to 991 mg/L. The predicted 48-hour EC_{50} of CASRN 106-93-4 to aquatic invertebrates is 82 mg/L, and the predicted 96-hour EC_{50} of CASRN 106-93-4 to aquatic plants is 35.4 mg/L.

A data gap for toxicity to aquatic plants was identified under the HPV Challenge Program.

Table 3. Summary Table of the Screening Information Data Set	
Endpoints	**SPONSORED CHEMICAL 1,2-Dibromoethane (CASRN 106-93-4)**
Summary of Human Health Data	
Acute Oral Toxicity LD_{50} (mg/kg-bw)	**116 - 133 (rat) > 30 < 50 (rabbit)**
Acute Inhalation Toxicity LC_{50} (mg/L)	**3.08 (2h; rat)**
Acute Dermal Toxicity LD_{50} (mg/kg-bw)	**> 300 < 650 (rabbit)**
Repeated-Dose Toxicity NOAEL/LOAEL Inhalation (mg/L)	**LOAEL ~ 0.077 NOAEL ~ 0.023 (rat; 13 weeks) LOAEL ~ 0.077 NOAEL = NE (mouse; 79-104 weeks) NOAEL ~ 0.38 (highest dose tested) (rabbit; 84 days) LOAEL ~ 0.19 NOAEL = NE (guinea pig; 205 days) LOAEL ~ 0.38 NOAEL ~ 0.19 (monkey; 70 days)**
Repeated-Dose Toxicity NOAEL/LOAEL Oral (mg/kg-bw/day)	**LOAEL = 38 NOAEL = NE (rat; 48-61 weeks) LOAEL = 62 NOAEL = NE (mouse; 53-78 weeks)**
Reproductive Toxicity NOAEL/LOAEL Inhalation (mg/L)	**LOAEL ~ 0.61 mg/L NOAEL ~ 0.30 mg/L**

Table 3. Summary Table of the Screening Information Data Set	
Endpoints	**SPONSORED CHEMICAL 1,2-Dibromoethane (CASRN 106-93-4)**
Developmental Toxicity NOAEL/LOAEL Inhalation (mg/L)	
Maternal Toxicity	**LOAEL ~ 0.29 mg/L NOAEL ~ 0.15 mg/L**
Developmental Toxicity	**LOAEL ~ 0.29 mg/L NOAEL ~ 0.15 mg/L (rats)**
Maternal Toxicity	**LOAEL ~ 0.29 mg/L NOAEL ~ 0.15 mg/L**
Developmental Toxicity	**LOAEL ~ 0.15 mg/L NOAEL = NE (mice)**
Genetic Toxicity – Gene Mutations *In vitro*	**Positive**
Genetic Toxicity – Gene Mutations *In vivo*	**Negative**
Genetic Toxicity – Chromosomal Aberrations *In vitro*	**Positive**
Genetic Toxicity – Chromosomal Aberrations *In vivo*	**Positive**
Genetic Toxicity – Other *In vitro* Unscheduled DNA Synthesis in Mammalian Cells Sister Chromatid Exchanges Mouse Lymphoma Assay	** Positive Positive Positive**
Genetic Toxicity – Other *In vivo* Unscheduled DNA Synthesis	** Positive**
Carcinogenicity Inhalation (rats/mice) Oral (rats/mice)	** Positive Positive**
Skin irritation	**Irritating**
Eye irritation	**Irritating**
Summary of Environmental Effects – Aquatic Toxicity Data	
Fish 96-h LC_{50} (mg/L)	**136 - 991**

Table 3. Summary Table of the Screening Information Data Set	
Endpoints	**SPONSORED CHEMICAL** **1,2-Dibromoethane** **(CASRN 106-93-4)**
Aquatic Invertebrates **48-h EC_{50} (mg/L)**	82 (e)
Aquatic Plants **72-h EC_{50} (mg/L)**	35.4 (e)

Bold = measured data; (e) = estimated data (i.e., derived from modeling); NE = Not established