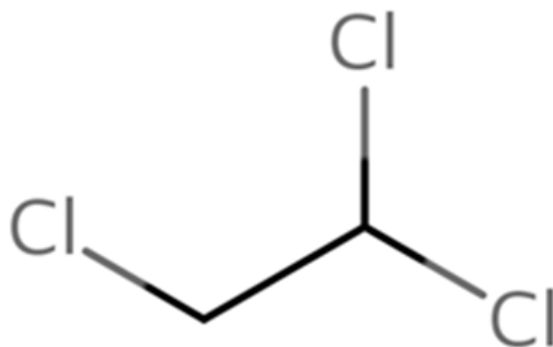

**Draft Data Extraction Information for
Environmental Hazard and Human Health Hazard Animal Toxicology and
Epidemiology for
1,1,2-Trichloroethane**

Systematic Review Support Document for the Draft Risk Evaluation

CASRN: 79-00-5



May 2026

This supplemental file contains information regarding the data extraction results relevant to the *Draft Human Health and Environmental Hazard Assessment for 1,1,2-Trichloroethane*. EPA used the TSCA systematic review process described in the *Draft Systematic Review Protocol Supporting TSCA Risk Evaluations for Chemical Substances* (referred to hereafter as the '2021 Draft Systematic Review Protocol'). Any updated steps in the systematic review process since the publication of the 2021 Draft Systematic Review Protocol are described in the *Draft Systematic Review Protocol for 1,1,2-Trichloroethane*. EPA conducted data extraction based on author-reported descriptions and results; additional analyses (*e.g.*, statistical analyses performed during data integration into the risk evaluation) potentially conducted by EPA are not contained in this supplemental file.

Environmental Hazard Data Extraction: As explained in Section 6.4 of the 2021 Draft Systematic Review Protocol, key study details (*e.g.*, exposure duration vs. study duration) were extracted from references that underwent data quality evaluation; these study details are available in the tables below. The study details and respective endpoints were organized first by relevant habitat (*i.e.*, aquatic vs. terrestrial), followed by taxa categories (*e.g.*, vertebrates, invertebrates, vegetation), taxonomic groups (*e.g.*, fish, amphibian, mammalian, avian, worms, vascular plants), individual species, and finally exposure duration.

All the references that underwent data quality evaluation using the environmental hazard data quality metrics were extracted regardless of metric ranking and are included in this supplemental file. In the environmental hazard data extraction table, for some studies there were hazard health outcomes with multiple health effect levels extracted from ECOTOX; if all the data for one same health outcome were the same except for the health effect level (*e.g.*, LOEL level), multiple data extraction rows were combined into a single row in the table. All the extracted environmental hazard data will also be available in the [ECOTOXicology Knowledgebase \(ECOTOX\) database](#); moreover, additional data sources and experimental details for these studies will also be available in ECOTOX.

Data Extraction of Rodent Data for the Application of Environmental Hazard: For 1,1,2-trichloroethane, toxicity data gaps were identified for mammalian wildlife relevant to the terrestrial compartment of the environmental hazard assessment. This table includes rodent data for 1,1,2-trichloroethane, which were used as proxy for mammalian wildlife. The rodent data were evaluated following the human health hazard animal toxicity evaluation and extraction process; however, additional data for health outcomes most relevant for environmental hazard assessment were extracted and are listed here.

Human Health Hazard Animal Toxicity Extraction: This supplemental file contains information regarding the data extraction conducted for references that met PECO screening criteria and were identified by EPA as detailed in the *Draft Systematic Review Protocol for 1,1,2-Trichloroethane*. In addition to this data, a point of departure (POD) was reported. The POD extracted is author reported when available. When the study author does not report a POD, EPA reviewers selected the lowest point of departure (POD). As well as the target organ, any co-critical effects were reported along with OQD for the health outcome. In some cases, a POD could not be determined due to deficits in the reference, and the reviewer wrote "Uninformative - not suitable for POD determination" in the POD field (*i.e.* uninformative for dose response, but may have qualitative weight of scientific evidence value). A detailed summary statement of each study is reported along with the major limitations as identified by the reviewer and any guidelines used.

Epidemiological Study Information Extraction: All epidemiology references that met PECO screening criteria were extracted as detailed in Section 6.4 of the 2021 Draft Systematic Review Protocol and the *Draft Systematic Review Protocol for 1,1,2-Trichloroethane*. The data extracted include the measured health effect or endpoint, a description of the study population, the specific exposure compound measured and summary levels of exposure, the method of exposure measurement, and a summary of the results. Each health outcome assessed in a reference is extracted separately, and as such, each reference may have more than one record in the data extraction tables, with each record categorized by health outcome.

HERO ID	Reference	Page
Environmental Hazard		14
1,1,2-Trichloroethane		
Habitat: Aquatic Taxa: Arthropods		
	<i>Artemia salina</i> (Brine Shrimp)	
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554.	14
	<i>Chaetogammarus marinus</i> (Amphipod)	
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554.	15
	<i>Chironomus riparius</i> (Midge)	
5352369	Roghair, C. J., Buijze, A., Yedema, E., E.S., Hermens, M., J.L. (1994). A QSAR for base-line toxicity to the midge Chironomus riparius. Chemosphere 28(5):989-997.	16
10706027	Smithers, (2023). 1,1,2-Trichloroethane - Sediment-water chironomid (Chironomus riparius) life-cycle toxicity test using spiked sediment, following OECD Guideline 233.	18
	<i>Crangon crangon</i> (Sand Shrimp)	
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554.	84
	<i>Daphnia magna</i> (Water Flea)	
10609980	3M Environmental Lab, (1984). [Redacted] Data summary report on the tests for acute & chronic toxicity of fluorochemicals to Daphnia magna (water flea).	84
5352364	Adema, M., D.M. (1978). Daphnia magna as a test animal in acute and chronic toxicity tests. Hydrobiologia 59(2):125-134.	88
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554.	89
660810	Freitag, D., Ballhorn, L., Behechti, A., Fischer, K., Thumm, W. (1994). Structural configuration and toxicity of chlorinated alkanes. Chemosphere 28(2):253-259.	90
7508	Leblanc, G. A. (1980). Acute toxicity of priority pollutants to water flea (Daphnia magna). Bulletin of Environmental Contamination and Toxicology 24(5):684-691.	90
3634174	Richter, J. E., Peterson, S. F., Kleiner, C. F. (1983). Acute and chronic toxicity of some chlorinated benzenes, chlorinated ethanes, and tetrachloroethylene to Daphnia magna. Archives of Environmental Contamination and Toxicology 12(6):679-684.	91
	<i>Palaemonetes varians</i> (Grass Or Atlantic Ditch Shrimp)	
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554.	94
	<i>Temora longicornis</i> (Calanoid Copepod)	

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5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554.	94
Habitat: Aquatic Taxa: Fish		
	<i>Jordanella floridae</i> (Flagfish)	
95201	Smith, A. D., Bharath, A., Mallard, C., Orr, D., Smith, K., Sutton, J. A., Vukmanich, J., Mccarty, L. S., Ozburn, G. W. (1991). The acute and chronic toxicity of ten chlorinated organic compounds to the American flagfish (<i>Jordanella floridae</i>). Archives of Environmental Contamination and Toxicology 20(1):94-102.	95
	<i>Lepomis macrochirus</i> (Bluegill)	
18064	Buccafusco, R. J., Ells, S. J., Leblanc, G. A. (1981). Acute toxicity of priority pollutants to bluegill (<i>Lepomis macrochirus</i>). Bulletin of Environmental Contamination and Toxicology 26(4):446-452.	97
	<i>Oncorhynchus mykiss</i> (Rainbow Trout)	
4840530	K, Kaiser, L. E., Mckinnon, M. B., Stendahl, D. H., Pett, W. B. (1995). Response threshold levels of selected organic compounds for rainbow trout (<i>Oncorhynchus mykiss</i>). Environmental Toxicology and Chemistry 14(12):2107-2113.	97
	<i>Pimephales promelas</i> (Fathead Minnow)	
7494661	Ahmad, N., Benoit, D., Brooke, L., Call, D., Carlson, A., DeFoe, D., Huot, J., Morairity, A., Richter, J. (1984). Aquatic toxicity tests to characterise the hazard of volatile organic chemicals in water: A toxicity data summary – parts I and II.	98
32169	Geiger, D. L., Northcott, C. E., Call, D. J., Brooke, L. T. (1985). Acute toxicities of organic chemicals to fathead minnows (<i>Pimephales promelas</i>): Volume II.	99
4259619	Walbridge, C. T., Fiandt, J. T., Phipps, G. L., Holcombe, G. W. (1983). Acute toxicity of ten chlorinated aliphatic hydrocarbons to the fathead minnow (<i>Pimephales promelas</i>). Archives of Environmental Contamination and Toxicology 12(6):661-666.	100
	<i>Pleuronectes platessa</i> (Plaice, Sand Dab)	
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554.	101
	<i>Poecilia reticulata</i> (Guppy)	
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554.	103
3684127	Könemann, H. (1981). Quantitative structure-activity relationships in fish toxicity studies. Part 1: Relationship for 50 industrial pollutants. Toxicology 19(3):209-221.	104
	<i>Pomatoschistus minutus</i> (Sand Goby)	
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554.	104
Habitat: Aquatic Taxa: Non-vascular plants		
	<i>Chlamydomonas reinhardtii</i> (Green Algae)	
661061	Brack, W., Rottler, H. (1994). Toxicity testing of highly volatile chemicals with green algae: A new assay. Environmental Science and Pollution Research 1(4):223-228.	106
	<i>Chlamydomonas sp.</i> (Green Algae)	
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554.	106
	<i>Chlorella ovalis</i> (Green Algae)	

1,1,2-Trichloroethane

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5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554. <i>Chlorella pyrenoidosa</i> (Green Algae)	106
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554. <i>Desmodesmus subspicatus</i> (Green Algae)	106
10214703	Behecti, A., Ballhorn, L., Kettrup, A. (1995). Toxicity of chlorinated alkanes on the alga <i>Scenedesmus subspicatus</i> in a closed test vessel. Fresenius Environmental Bulletin 4(3):148-153.	107
660810	Freitag, D., Ballhorn, L., Behecti, A., Fischer, K., Thumm, W. (1994). Structural configuration and toxicity of chlorinated alkanes. Chemosphere 28(2):253-259. <i>Dunaliella sp.</i> (Green Algae)	107
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554. <i>Phaeodactylum tricornutum</i> (Diatom)	107
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554. <i>Raphidocelis subcapitata</i> (Green Algae)	108
4141189	Hsieh, S. H., Hsu, C. H., Tsai, D., Chen, C. Y. (2006). Quantitative structure-activity relationships for toxicity of nonpolar narcotic chemicals to <i>Pseudokirchneriella subcapitata</i> . Environmental Toxicology and Chemistry 25(11):2920-2926.	108
3617867	Tsai, K. P., Chen, C. Y. (2007). An algal toxicity database of organic toxicants derived by a closed-system technique. Environmental Toxicology and Chemistry 26(9):1931-1939.	108
Habitat: Aquatic Taxa: Mollusks		
	<i>Crepidula fornicata</i> (Slipper Limpet)	
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554. <i>Dreissena polymorpha</i> (Zebra Mussel)	109
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554. <i>Lymnaea stagnalis</i> (Great Pond Snail)	109
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554. <i>Mytilus edulis</i> (Common Bay Mussel, Blue Mussel)	109
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554.	110
Habitat: Aquatic Taxa: Worms		
	<i>Ophryotrocha diadema</i> (Polychaete)	
5352365	Adema, M., D.M., Vink, G. J. (1981). A comparative study of the toxicity of 1,1,2-trichloroethane, dieldrin, pentachlorophenol and 3,4 dichloroaniline for marine and fresh water organisms. Chemosphere 10(6):533-554. <i>Ophryotrocha labronica</i> (Polychaete)	111

5442093	Rosenberg, R., Grahn, O., Johansson, L. (1975). Toxic effects of aliphatic chlorinated by-products from vinyl chloride production on marine animals. Water Research 9(7):607-612.	111
Habitat: Terrestrial Taxa: Vascular plants		
<i>Populus x canadensis</i> (Canadian Poplar)		
42313	Dietz, A. C., Schnoor, J. L. (2001). Phytotoxicity of chlorinated aliphatics to hybrid poplar (<i>Populus deltoides</i> x <i>nigra</i> DN34). Environmental Toxicology and Chemistry 20(2):389-393.	114
Habitat: Terrestrial Taxa: Avian		
<i>Gallus gallus</i> (Chicken)		
94468	Elovaara, E., Hemminki, K., Vainio, H. (1979). Effects of methylene chloride, trichloroethane, trichloroethylene, tetrachloroethylene and toluene on the development of chick embryos. Toxicology 12(2):111-119.	115
Habitat: Terrestrial Taxa: Worms		
<i>Eisenia fetida</i> (Earthworm)		
3625226	Neuhauser, E. F., Loehr, R. C., Malecki, M. R., Milligan, D. L., Durkin, P. R. (1985). The toxicity of selected organic chemicals to the earthworm <i>Eisenia fetida</i> . Journal of Environmental Quality 14(3):383-388.	117

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29336	Carlson, G. P. (1973). Effect of phenobarbital and 3-methylcholanthrene pretreatment on the hepatotoxicity of 1,1,1-trichloroethane and 1,1,2-trichloroethane. Life Sciences 13(1):67-73.	118
29227	Gehring, P. J. (1968). Hepatotoxic potency of various chlorinated hydrocarbon vapours relative to their narcotic and lethal potencies in mice. Toxicology and Applied Pharmacology 13(3):287-298.	118
18954	Moody, D. E., James, J. L., Clawson, G. A., Smuckler, E. A. (1981). Correlations among the changes in hepatic microsomal components after intoxication with alkyl halides and other hepatotoxins. Molecular Pharmacology 20(3):685-693.	118
64556	Sanders, V. M., White, K. L., Jr, Shopp, G. M., Jr, Munson, A. E. (1985). Humoral and cell-mediated immune status of mice exposed to 1,1,2-trichloroethane. Drug and Chemical Toxicology 8(5):357-372.	118
64557	Seidenberg, J. M., Anderson, D. G., Becker, R. A. (1986). Validation of an in vivo developmental toxicity screen in the mouse. Teratogenesis, Carcinogenesis, and Mutagenesis 6(5):361-374.	118
64564	White, K. L., Jr, Sanders, V. M., Barnes, D. W., Shopp, G. M., Jr, Munson, A. E. (1985). Toxicology of 1,1,2-trichloroethane in the mouse. Drug and Chemical Toxicology 8(5):333-355.	118
664458	WIL Research, (2001). Acute inhalation toxicity (with histopathology) study of 1,1,2-trichloroethane (1,1,2-TCE) in rats.	119

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1,1,2-Trichloroethane

Acute (less than or equal to 24 hr)

29336	Carlson, G. P. (1973). Effect of phenobarbital and 3-methylcholanthrene pretreatment on the hepatotoxicity of 1,1,1-trichloroethane and 1,1,2-trichloroethane. Life Sciences 13(1):67-73.	120
660794	Charbonneau, M., Greselin, E., Brodeur, J., Plaa, G. L. (1991). Influence of acetone on the severity of the liver injury induced by haloalkane mixtures. Canadian Journal of Physiology and Pharmacology 69(12):1901-1907.	120

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194679	Crebelli, R., Carere, A., Leopardi, P., Conti, L., Fassio, F., Raiteri, F., Barone, D., Ciliutti, P., Cinelli, S., Vericat, J. A. (1999). Evaluation of 10 aliphatic halogenated hydrocarbons in the mouse bone marrow micronucleus test. <i>Mutagenesis</i> 14(2):207-215.	121
10699088	Dow Chemical, (1960). Results of range finding toxicological tests on 1,1,2-trichloroethane.	121
725343	Dow Chemical, (1956). Results of skin absorption studies on carbon tetrachloride, ethylene dichloride, tetrachloroethylene, trichloroethylene, and chloroethene.	123
29227	Gehring, P. J. (1968). Hepatotoxic potency of various chlorinated hydrocarbon vapours relative to their narcotic and lethal potencies in mice. <i>Toxicology and Applied Pharmacology</i> 13(3):287-298.	123
58005	Harms, M. S., Peterson, R. E., Fujimoto, J. M., Erwin, C. P. (1976). Increased "bile duct-pancreatic fluid" flow in chlorinated hydrocarbon-treated rats. <i>Toxicology and Applied Pharmacology</i> 35(1):41-49.	123
64549	Klaassen, C. D., Plaa, G. L. (1966). Relative effects of various chlorinated hydrocarbons on liver and kidney function in mice. <i>Toxicology and Applied Pharmacology</i> 9(1):139-151.	123
64550	Klaassen, C. D., Plaa, G. L. (1967). Relative effects of various chlorinated hydrocarbons on liver and kidney function in dogs. <i>Toxicology and Applied Pharmacology</i> 10(1):119-131.	124
9913	Klaassen, C. D., Plaa, G. L. (1969). Comparison of the biochemical alterations elicited in livers from rats treated with carbon tetrachloride, chloroform, 1,1,2-trichloroethane and 1,1,1-trichloroethane. <i>Biochemical Pharmacology</i> 18(8):2019-2027.	124
1740624	Kronevi, T., Wahlberg, J., Holmberg, B. (1977). Morphological lesions in guinea pigs during skin exposure to 1,1,2-trichloroethane. <i>Acta Pharmacologica et Toxicologica</i> 41(4):298-305.	126
62934	Lundberg, I., Ekdahl, M., Kronevi, T., Lidums, V., Lundberg, S. (1986). Relative hepatotoxicity of some industrial solvents after intraperitoneal injection or inhalation exposure in rats. <i>Environmental Research</i> 40(2):411-420.	127
5466893	Mellon Institute, (1946). Acute inhalation toxicity of 1,1,2-trichloroethane and 1,1,2,2-tetrachloroethylene in rats.	127
200479	Milman, H. A., Story, D. L., Riccio, E. S., Sivak, A., Tu, A. S., Williams, G. M., Tong, C., Tyson, C. A. (1988). Rat liver foci and in vitro assays to detect initiating and promoting effects of chlorinated ethanes and ethylenes. <i>Annals of the New York Academy of Sciences</i> 534:521-530.	128
18954	Moody, D. E., James, J. L., Clawson, G. A., Smuckler, E. A. (1981). Correlations among the changes in hepatic microsomal components after intoxication with alkyl halides and other hepatotoxins. <i>Molecular Pharmacology</i> 20(3):685-693.	128
68728	Niklasson, M., Tham, R., Larsby, B., Eriksson, B. (1993). Effects of toluene, styrene, trichloroethylene, and trichloroethane on the vestibulo- and opto-oculo motor system in rats. <i>Neurotoxicology and Teratology</i> 15(5):327-334.	128
29447	Plaa, G. L., Evans, E. A., Hine, C. H. (1958). Relative hepatotoxicity of seven halogenated hydrocarbons. <i>Journal of Pharmacology and Experimental Therapeutics</i> 123:224-229.	129
64411	Plaa, G. L., Larson, R. E. (1965). Relative nephrotoxic properties of chlorinated methane, ethane, and ethylene derivatives in mice. <i>Toxicology and Applied Pharmacology</i> 7(1):37-44.	129
83190	Stadler, J. C., Kennedy, G. L., Jr (1996). Evaluation of the sensory irritation potential of volatile organic chemicals from carpets: Alone and in combination. <i>Food and Chemical Toxicology</i> 34(11-12):1125-1130.	129
64561	Tyson, C. A., Hawk-Prather, K., Story, D. L., Gould, D. H. (1983). Correlations of in vitro and in vivo hepatotoxicity for five haloalkanes. <i>Toxicology and Applied Pharmacology</i> 70(2):289-302.	130
74541	Wahlberg, J. E. (1976). Percutaneous toxicity of solvents: a comparative investigation in the guinea pig with benzene, toluene and 1,1,2-trichloroethane. <i>Annals of Occupational Hygiene</i> 19(2):115-119.	130
64564	White, K. L., Jr, Sanders, V. M., Barnes, D. W., Shopp, G. M., Jr, Munson, A. E. (1985). Toxicology of 1,1,2-trichloroethane in the mouse. <i>Drug and Chemical Toxicology</i> 8(5):333-355.	131
6547036	WIL Research, (2004). An acute neurotoxicity study of 1,1,2-trichloroethane in rats.	131
664458	WIL Research, (2001). Acute inhalation toxicity (with histopathology) study of 1,1,2-trichloroethane (1,1,2-TCE) in rats.	132

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659098	Xia, L., Yu, T. (1992). Study of the relationship between the hepatotoxicity and free radical induced by 1,1,2-trichloroethane and 1,1,1-trichloroethane in rat. Biomedical and Environmental Sciences 5(4):303-313.	135
Short-term (>1-30 days)		
3501912	Al-Griw, M. A., Alghazeer, R. O., Al-Azreg, S. A., Bennour, E. M. (2016). Cellular and molecular etiology of hepatocyte injury in a murine model of environmentally induced liver abnormality. 6(3):150-157.	137
10699088	Dow Chemical, (1960). Results of range finding toxicological tests on 1,1,2-trichloroethane.	137
64411	Plaa, G. L., Larson, R. E. (1965). Relative nephrotoxic properties of chlorinated methane, ethane, and ethylene derivatives in mice. Toxicology and Applied Pharmacology 7(1):37-44.	138
64556	Sanders, V. M., White, K. L., Jr, Shopp, G. M., Jr, Munson, A. E. (1985). Humoral and cell-mediated immune status of mice exposed to 1,1,2-trichloroethane. Drug and Chemical Toxicology 8(5):357-372.	138
5469150	Wahlberg, J. E. (1984). Edema-inducing effects of solvents following topical administration. Dermatosen in Beruf und Umwelt 32(3):91-94.	139
74541	Wahlberg, J. E. (1976). Percutaneous toxicity of solvents: a comparative investigation in the guinea pig with benzene, toluene and 1,1,2-trichloroethane. Annals of Occupational Hygiene 19(2):115-119.	140
64564	White, K. L., Jr, Sanders, V. M., Barnes, D. W., Shopp, G. M., Jr, Munson, A. E. (1985). Toxicology of 1,1,2-trichloroethane in the mouse. Drug and Chemical Toxicology 8(5):333-355.	141
Subchronic (>30-91 days)		
6547037	Dow Chemical, (2005). 1,1,2-Trichloroethane: Subchronic neurotoxicity study in F344/DUCRL rats.	142
200479	Milman, H. A., Story, D. L., Riccio, E. S., Sivak, A., Tu, A. S., Williams, G. M., Tong, C., Tyson, C. A. (1988). Rat liver foci and in vitro assays to detect initiating and promoting effects of chlorinated ethanes and ethylenes. Annals of the New York Academy of Sciences 534:521-530.	142
64556	Sanders, V. M., White, K. L., Jr, Shopp, G. M., Jr, Munson, A. E. (1985). Humoral and cell-mediated immune status of mice exposed to 1,1,2-trichloroethane. Drug and Chemical Toxicology 8(5):357-372.	143
64564	White, K. L., Jr, Sanders, V. M., Barnes, D. W., Shopp, G. M., Jr, Munson, A. E. (1985). Toxicology of 1,1,2-trichloroethane in the mouse. Drug and Chemical Toxicology 8(5):333-355.	143
6324088	WIL Research, (2002). A 90-day inhalation study of 1,1,2-trichloroethane (1,1,2-TCE) in rats (with satellite groups for pharmacokinetic evaluations in rats and mice)..	144
Chronic (>91 days)		
1973131	Mellon Institute, (1947). Repeated exposure of rats and dogs to vapors of eight chlorinated hydrocarbons.	147
64554	NCI, (1978). Bioassay of 1,1,2-trichloroethane for possible carcinogenicity. National Cancer Institute Carcinogenesis Technical Report Series 74:1-104.	149
659081	Norpoth, K., Heger, M., Muller, G., Mohtashampur, E., Kemena, A., Witting, C. (1988). Investigations on metabolism and carcinogenicity of 1,1,2- trichloroethane. Journal of Cancer Research and Clinical Oncology 114(2):158-162.	150
Reproductive/Developmental		
6547034	DuPont, (2006). 1,1,2-Trichloroethane: Multigeneration reproduction study in rats.	152
5365	George, J. D., Price, C. J., Marr, M. C., Sadler, B. M., Schwetz, B. A., Birnbaum, L. S., Morrissey, R. E. (1989). Developmental toxicity of 1,1,1-trichloroethane in CD rats. Toxicological Sciences 13(4):641-651.	153
64557	Seidenberg, J. M., Anderson, D. G., Becker, R. A. (1986). Validation of an in vivo developmental toxicity screen in the mouse. Teratogenesis, Carcinogenesis, and Mutagenesis 6(5):361-374.	154

6547035	WIL Research, (2005). A prenatal developmental toxicity study of 1,1,2-trichloroethane via drinking water rats.	154
 Isomer: 1,1,1-Trichloroethane		
Acute (less than or equal to 24 hr)		
64580	Bernard, A. M., Russis, de, R., Normand, J. C., Lauwerys, R. R. (1989). Evaluation of the subacute nephrotoxicity of cyclohexane and other industrial solvents in the female Sprague-Dawley rat. Toxicology Letters 45(2-3):271-280.	157
5454703	Bowen, S. E., Balster, R. L. (1998). A direct comparison of inhalant effects on locomotor activity and schedule-controlled behavior in mice. Experimental and Clinical Psychopharmacology 6(3):235-247.	157
29371	Carlson, G. (1981). Effect of alterations in drug metabolism on epinephrine-induced cardiac arrhythmias in rabbits exposed to Methylchloroform. Toxicology Letters 9(4):307-313.	158
29336	Carlson, G. P. (1973). Effect of phenobarbital and 3-methylcholanthrene pretreatment on the hepatotoxicity of 1,1,1-trichloroethane and 1,1,2-trichloroethane. Life Sciences 13(1):67-73.	158
660794	Charbonneau, M., Greselin, E., Brodeur, J., Plaa, G. L. (1991). Influence of acetone on the severity of the liver injury induced by haloalkane mixtures. Canadian Journal of Physiology and Pharmacology 69(12):1901-1907.	159
5466898	Dow Chemical, (1988). Aerothene TT: An acute vapor inhalation study in Fischer 344 rats with cover letter dated 051688.	159
725343	Dow Chemical, (1956). Results of skin absorption studies on carbon tetrachloride, ethylene dichloride, tetrachloroethylene, trichloroethylene, and chloroethene.	161
29227	Gehring, P. J. (1968). Hepatotoxic potency of various chlorinated hydrocarbon vapours relative to their narcotic and lethal potencies in mice. Toxicology and Applied Pharmacology 13(3):287-298.	161
75061	Hobara, T., Kobayashi, H., Higashihara, E., Kawamoto, T., Sakai, T. (1984). Acute effects of 1,1,1-trichloroethane, trichloroethylene, and toluene on the hematologic parameters in dogs. Archives of Environmental Contamination and Toxicology 13(5):589-593.	162
64549	Klaassen, C. D., Plaa, G. L. (1966). Relative effects of various chlorinated hydrocarbons on liver and kidney function in mice. Toxicology and Applied Pharmacology 9(1):139-151.	163
64550	Klaassen, C. D., Plaa, G. L. (1967). Relative effects of various chlorinated hydrocarbons on liver and kidney function in dogs. Toxicology and Applied Pharmacology 10(1):119-131.	163
9913	Klaassen, C. D., Plaa, G. L. (1969). Comparison of the biochemical alterations elicited in livers from rats treated with carbon tetrachloride, chloroform, 1,1,2-trichloroethane and 1,1,1-trichloroethane. Biochemical Pharmacology 18(8):2019-2027.	163
58151	Kronevi, T., Wahlberg, J. E., Holmberg, B. (1981). Skin pathology following epicutaneous exposure to seven organic solvents. International Journal of Tissue Reactions 3(1):21-30.	164
62934	Lundberg, I., Ekdahl, M., Kronevi, T., Lidums, V., Lundberg, S. (1986). Relative hepatotoxicity of some industrial solvents after intraperitoneal injection or inhalation exposure in rats. Environmental Research 40(2):411-420.	165
200479	Milman, H. A., Story, D. L., Riccio, E. S., Sivak, A., Tu, A. S., Williams, G. M., Tong, C., Tyson, C. A. (1988). Rat liver foci and in vitro assays to detect initiating and promoting effects of chlorinated ethanes and ethylenes. Annals of the New York Academy of Sciences 534:521-530.	165
95470	Moser, V. C., Balster, R. L. (1986). The effects of inhaled toluene, halothane, 1,1,1-trichloroethane, and ethanol on fixed-interval responding in mice. Neurotoxicology and Teratology 8(5):525-531.	165
5465638	Nakahama, T., Sarutani, S., Inouye, Y. (2000). Effects of tetrachloroethylene and 1,1,1-trichloroethane on the expression of P450 isoforms in rat lung and liver. Journal of Health Science 46(1):21-28.	166
29447	Plaa, G. L., Evans, E. A., Hine, C. H. (1958). Relative hepatotoxicity of seven halogenated hydrocarbons. Journal of Pharmacology and Experimental Therapeutics 123:224-229.	166

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5465564	Stacey, N. H. (1989). Toxicity of combinations of chlorinated aliphatic hydrocarbons in-vitro and in-vivo. <i>Toxicology In Vitro</i> 3(2):137-144.	167
61688	Wahlberg, J. E., Boman, A. (1979). Comparative percutaneous toxicity of ten industrial solvents in the guinea pig. <i>Scandinavian Journal of Work, Environment and Health</i> 5(4):345-351.	168
5465795	Wiley, J. L., Bowen, S. E., Balster, R. L. (2001). Effects of volatile inhalants on sensorimotor reactivity in rats. <i>Addiction Biology</i> 6(1):35-43.	169
659098	Xia, L., Yu, T. (1992). Study of the relationship between the hepatotoxicity and free radical induced by 1,1,2-trichloroethane and 1,1,1-trichloroethane in rat. <i>Biomedical and Environmental Sciences</i> 5(4):303-313.	170
Short-term (>1-30 days)		
4333726	Al-Griw, M. A., Treesh, S. A., Alghazeer, R. O., Regeai, S. O. (2017). Environmentally toxicant exposures induced intragenerational transmission of liver abnormalities in mice. <i>Toxicology</i> 7(3):244-253.	173
5360	Evans, E. B., Balster, R. L. (1993). Inhaled 1,1,1-trichloroethane-produced physical dependence in mice: effects of drugs and vapors on withdrawal. <i>Journal of Pharmacology and Experimental Therapeutics</i> 264(2):726-733.	173
62385	Kjellstrand, P., Bjerkemo, M., Adler-Maihofer, M., Holmquist, B. (1985). Effects of solvent exposure on testosterone levels and butyryl-cholinesterase activity in mice. <i>Acta Pharmacologica et Toxicologica</i> 57(4):242-249.	173
631732	Kyrklund, T., Haglid, K. G. (1990). Exposure of rats to high concentrations of 1,1,1-trichloroethane and its effects on brain lipid and fatty acid composition. <i>Pharmacology & Toxicology</i> 67(5):384-386.	174
64411	Plaa, G. L., Larson, R. E. (1965). Relative nephrotoxic properties of chlorinated methane, ethane, and ethylene derivatives in mice. <i>Toxicology and Applied Pharmacology</i> 7(1):37-44.	174
75357	Stacey, N. H. (1989). Toxicity of mixtures of trichloroethylene, tetrachloroethylene and 1,1,1-trichloroethane: Similarity of in vitro to in vivo responses. <i>Toxicology and Industrial Health</i> 5(3):441-450.	175
5469150	Wahlberg, J. E. (1984). Edema-inducing effects of solvents following topical administration. <i>Dermatosen in Beruf und Umwelt</i> 32(3):91-94.	176
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5469437	Chan, P. C. (2000). NTP technical report on the toxicity studies of 1,1,1-trichloroethane (CAS No. 71-55-6) administered in microcapsules in feed to F344/N rats and B6C3F1 mice. <i>Toxicity Report Series</i> , vol. 41 41(1):1-E20.	180
200479	Milman, H. A., Story, D. L., Riccio, E. S., Sivak, A., Tu, A. S., Williams, G. M., Tong, C., Tyson, C. A. (1988). Rat liver foci and in vitro assays to detect initiating and promoting effects of chlorinated ethanes and ethylenes. <i>Annals of the New York Academy of Sciences</i> 534:521-530.	182
Reproductive/Developmental		
196341	Coleman, C. N., Mason, T., Hooker, E. P., Robinson, S. E. (1999). Developmental effects of intermittent prenatal exposure to 1,1,1-trichloroethane in the rat. <i>Neurotoxicology and Teratology</i> 21(6):699-708.	184
62609	Lane, R. W., Riddle, B. L., Borzelleca, J. F. (1982). Effects of 1,2-dichloroethane and 1,1,1-trichloroethane in drinking water on reproduction and development in mice. <i>Toxicology and Applied Pharmacology</i> 63(3):409-421.	184
5467064	Run., Bushy (1987). Initial submission: Developmental toxicity study with inhaled 1,1,1-trichloroethane in New Zealand white rabbits with cover letter dated 08/28/92.	185
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Cancer/Carcinogenesis

5452779	Debono, N., Richardson, D., Keil, A., Kelly-Reif, K., Robinson, W., Troester, M., Marshall, S. (2019). Employment characteristics and cause-specific mortality at automotive electronics manufacturing plants in Huntsville, Alabama. American Journal of Industrial Medicine 62(4):296-308.	187
4697224	Dosemeci, M., Cocco, P., Chow, W. H. (1999). Gender differences in risk of renal cell carcinoma and occupational exposures to chlorinated aliphatic hydrocarbons. American Journal of Industrial Medicine 36(1):54-59.	187
702055	Garabrant, D., Held, J., Langholz, B., Bernstein, L. (1988). Mortality of aircraft manufacturing workers in southern California. American Journal of Industrial Medicine 13(6):683-693.	187
194820	Kernan, G. J., Ji, B. T., Dosemeci, M., Silverman, D. T., Balbus, J., Zahm, S. H. (1999). Occupational risk factors for pancreatic cancer: A case-control study based on death certificates from 24 U.S. states. American Journal of Industrial Medicine 36(2):260-270.	189
1069372	Young, T. B., Kanarek, M. S., Wolf, D. A., Wilson, D. A. (1990). Case-control study of colon cancer and volatile organics in Wisconsin municipal ground water supplies. :373-386.	189

Cardiovascular

200292	Dayal, H., Gupta, S., Trieff, N., Maier, D., Reich, D. (1995). Symptom clusters in a community with chronic exposure to chemicals in two superfund sites. Archives of Environmental Health 50(2):108-111.	190
5452779	Debono, N., Richardson, D., Keil, A., Kelly-Reif, K., Robinson, W., Troester, M., Marshall, S. (2019). Employment characteristics and cause-specific mortality at automotive electronics manufacturing plants in Huntsville, Alabama. American Journal of Industrial Medicine 62(4):296-308.	190
1576	Kilburn, K. H. (1999). Neurobehavioral and respiratory findings in jet engine repair workers: a comparison of exposed and unexposed volunteers. Environmental Research 80(3):244-252.	190

Endocrine

194820	Kernan, G. J., Ji, B. T., Dosemeci, M., Silverman, D. T., Balbus, J., Zahm, S. H. (1999). Occupational risk factors for pancreatic cancer: A case-control study based on death certificates from 24 U.S. states. American Journal of Industrial Medicine 36(2):260-270.	191
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Gastrointestinal

200292	Dayal, H., Gupta, S., Trieff, N., Maier, D., Reich, D. (1995). Symptom clusters in a community with chronic exposure to chemicals in two superfund sites. Archives of Environmental Health 50(2):108-111.	192
5452779	Debono, N., Richardson, D., Keil, A., Kelly-Reif, K., Robinson, W., Troester, M., Marshall, S. (2019). Employment characteristics and cause-specific mortality at automotive electronics manufacturing plants in Huntsville, Alabama. American Journal of Industrial Medicine 62(4):296-308.	192
1576	Kilburn, K. H. (1999). Neurobehavioral and respiratory findings in jet engine repair workers: a comparison of exposed and unexposed volunteers. Environmental Research 80(3):244-252.	192
1069372	Young, T. B., Kanarek, M. S., Wolf, D. A., Wilson, D. A. (1990). Case-control study of colon cancer and volatile organics in Wisconsin municipal ground water supplies. :373-386.	193

Immune/Hematological

200292	Dayal, H., Gupta, S., Trieff, N., Maier, D., Reich, D. (1995). Symptom clusters in a community with chronic exposure to chemicals in two superfund sites. Archives of Environmental Health 50(2):108-111.	194
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Irritation		
1576	Kilburn, K. H. (1999). Neurobehavioral and respiratory findings in jet engine repair workers: a comparison of exposed and unexposed volunteers. <i>Environmental Research</i> 80(3):244-252.	195
Lung/Respiratory		
200292	Dayal, H., Gupta, S., Trieff, N., Maieron, D., Reich, D. (1995). Symptom clusters in a community with chronic exposure to chemicals in two superfund sites. <i>Archives of Environmental Health</i> 50(2):108-111.	196
5452779	Debono, N., Richardson, D., Keil, A., Kelly-Reif, K., Robinson, W., Troester, M., Marshall, S. (2019). Employment characteristics and cause-specific mortality at automotive electronics manufacturing plants in Huntsville, Alabama. <i>American Journal of Industrial Medicine</i> 62(4):296-308.	196
1576	Kilburn, K. H. (1999). Neurobehavioral and respiratory findings in jet engine repair workers: a comparison of exposed and unexposed volunteers. <i>Environmental Research</i> 80(3):244-252.	196
Mortality		
5452779	Debono, N., Richardson, D., Keil, A., Kelly-Reif, K., Robinson, W., Troester, M., Marshall, S. (2019). Employment characteristics and cause-specific mortality at automotive electronics manufacturing plants in Huntsville, Alabama. <i>American Journal of Industrial Medicine</i> 62(4):296-308.	199
Musculoskeletal		
1576	Kilburn, K. H. (1999). Neurobehavioral and respiratory findings in jet engine repair workers: a comparison of exposed and unexposed volunteers. <i>Environmental Research</i> 80(3):244-252.	200
Neurological/Behavioral		
200292	Dayal, H., Gupta, S., Trieff, N., Maieron, D., Reich, D. (1995). Symptom clusters in a community with chronic exposure to chemicals in two superfund sites. <i>Archives of Environmental Health</i> 50(2):108-111.	201
5452779	Debono, N., Richardson, D., Keil, A., Kelly-Reif, K., Robinson, W., Troester, M., Marshall, S. (2019). Employment characteristics and cause-specific mortality at automotive electronics manufacturing plants in Huntsville, Alabama. <i>American Journal of Industrial Medicine</i> 62(4):296-308.	202
1576	Kilburn, K. H. (1999). Neurobehavioral and respiratory findings in jet engine repair workers: a comparison of exposed and unexposed volunteers. <i>Environmental Research</i> 80(3):244-252.	202
677146	Laire, G., Viaene, M. K., Veulemans, H., Masschelein, R., Nemery, B. (1997). Nocturnal oxygen desaturation, as assessed by home oximetry, in long-term solvent-exposed workers. <i>American Journal of Industrial Medicine</i> 32(6):656-664.	208
Ocular & Sensory		
200292	Dayal, H., Gupta, S., Trieff, N., Maieron, D., Reich, D. (1995). Symptom clusters in a community with chronic exposure to chemicals in two superfund sites. <i>Archives of Environmental Health</i> 50(2):108-111.	209
Other		
1938385	Guo, P., Yokoyama, K., Piao, F., Sakai, K., Khalequzzaman, M., Kamijima, M., Nakajima, T., Kitamura, F. (2013). Sick building syndrome by indoor air pollution in Dalian, China. <i>International Journal of Environmental Research and Public Health</i> 10(4):1489-1504.	210
1576	Kilburn, K. H. (1999). Neurobehavioral and respiratory findings in jet engine repair workers: a comparison of exposed and unexposed volunteers. <i>Environmental Research</i> 80(3):244-252.	210
677146	Laire, G., Viaene, M. K., Veulemans, H., Masschelein, R., Nemery, B. (1997). Nocturnal oxygen desaturation, as assessed by home oximetry, in long-term solvent-exposed workers. <i>American Journal of Industrial Medicine</i> 32(6):656-664.	210
Renal/Kidney		

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5452779	Debono, N., Richardson, D., Keil, A., Kelly-Reif, K., Robinson, W., Troester, M., Marshall, S. (2019). Employment characteristics and cause-specific mortality at automotive electronics manufacturing plants in Huntsville, Alabama. American Journal of Industrial Medicine 62(4):296-308.	211
4697224	Dosemeci, M., Cocco, P., Chow, W. H. (1999). Gender differences in risk of renal cell carcinoma and occupational exposures to chlorinated aliphatic hydrocarbons. American Journal of Industrial Medicine 36(1):54-59.	211
Reproductive/Developmental		
200239	Bove, F. J. (1996). Public drinking water contamination and birthweight, prematurity, fetal deaths, and birth defects. Toxicology and Industrial Health 12(2):255-266.	212
194932	Bove, F. J., Fulcomer, M. C., Klotz, J. B., Esmart, J., Dufficy, E. M., Savrin, J. E. (1995). Public drinking water contamination and birth outcomes. American Journal of Epidemiology 141(9):850-862.	213
2799700	Brender, J. D., Shinde, M. U., Zhan, F. B., Gong, X., Langlois, P. H. (2014). Maternal residential proximity to chlorinated solvent emissions and birth defects in offspring: A case-control study. Environmental Health 13(1):96.	213
200292	Dayal, H., Gupta, S., Trieff, N., Maieron, D., Reich, D. (1995). Symptom clusters in a community with chronic exposure to chemicals in two superfund sites. Archives of Environmental Health 50(2):108-111.	213
671475	Sallmen, M., Lindbohm, M. L., Anttila, A., Kyyronen, P., Taskinen, H., Nykyri, E., Hemminki, K. (1998). Time to pregnancy among the wives of men exposed to organic solvents. Occupational and Environmental Medicine 55(1):24-30.	214
5414	Taskinen, H., Anttila, A., Lindbohm, M. L., Sallmén, M., Hemminki, K. (1989). Spontaneous abortions and congenital malformations among the wives of men occupationally exposed to organic solvents. Scandinavian Journal of Work, Environment and Health 15(5):345-352.	214
708475	Wrensch, M., Swan, S., Lipscomb, J., Epstein, D., Fenster, L., Claxton, K., Murphy, P., Shusterman, D., Neutra, R. (1990). Pregnancy outcomes in women potentially exposed to solvent-contaminated drinking water in San Jose, California. American Journal of Epidemiology 131(2):283-300.	214
Skin and Connective Tissue		
200292	Dayal, H., Gupta, S., Trieff, N., Maieron, D., Reich, D. (1995). Symptom clusters in a community with chronic exposure to chemicals in two superfund sites. Archives of Environmental Health 50(2):108-111.	216

Intentional Dosing Studies

1,1,2-Trichloroethane

Irritation

5469150	Wahlberg, J. E. (1984). Edema-inducing effects of solvents following topical administration. Dermatosen in Beruf und Umwelt 32(3):91-94.	217
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Aquatic: Arthropods Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	48 Hour(s), (7 Day(s))	<i>Artemia salina</i> (Brine Shrimp), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (72 mg/L)	Mortality	Low	5352365
79-00-5	48 Hour(s), (7 Day(s))	<i>Artemia salina</i> (Brine Shrimp), Larva, 3 Day(s), Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (62 mg/L)	Mortality	Low	5352365
79-00-5	96 Hour(s), (7 Day(s))	<i>Artemia salina</i> (Brine Shrimp), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (52 mg/L)	Mortality	Low	5352365
79-00-5	96 Hour(s), (7 Day(s))	<i>Artemia salina</i> (Brine Shrimp), Larva, 3 Day(s), Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (40 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Artemia salina</i> (Brine Shrimp), Larva, 3 Day(s), Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (36 mg/L)	Mortality	Low	5352365
79-00-5	10 Day(s), (28 Day(s))	<i>Artemia salina</i> (Brine Shrimp), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (43 mg/L)	Mortality	Low	5352365
79-00-5	3 Week(s), (28 Day(s))	<i>Artemia salina</i> (Brine Shrimp), Larva, 3 Day(s), Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Reproduction (Reproduction-Reproduction, general, Response Site: Not reported)	EC50 (15 mg/L)	Development/Growth	Low	5352365

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Aquatic: Arthropods Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	3 Week(s), (28 Day(s))	<i>Artemia salina</i> (Brine Shrimp), Larva, 3 Day(s), Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Reproduction (Reproduction-Reproduction, general, Response Site: Not reported)	NOEC (10 mg/L)	Development/Growth	Low	5352365
79-00-5	3 Week(s), (28 Day(s))	<i>Artemia salina</i> (Brine Shrimp), Larva, 3 Day(s), Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (36 mg/L)	Mortality	Low	5352365
79-00-5	48 Hour(s), (7 Day(s))	<i>Chaetogammarus marinus</i> (Amphipod), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (82 mg/L)	Mortality	Low	5352365
79-00-5	48 Hour(s), (7 Day(s))	<i>Chaetogammarus marinus</i> (Amphipod), Larva, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (72 mg/L)	Development/Growth	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Chaetogammarus marinus</i> (Amphipod), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (62 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Chaetogammarus marinus</i> (Amphipod), Larva, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (48 mg/L)	Mortality	Low	5352365
79-00-5	14 Day(s), (48 Week(s))	<i>Chaetogammarus marinus</i> (Amphipod), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (50 mg/L)	Mortality	Low	5352365
79-00-5	3 Week(s), (48 Week(s))	<i>Chaetogammarus marinus</i> (Amphipod), Larva, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (41 mg/L)	Mortality	Low	5352365

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Aquatic: Arthropods Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	48 Hour(s), (48 Hour(s))	<i>Chironomus riparius</i> (Midge), Larva, 3 Instar, Not Reported, Laboratory (REARED AT NATIONAL INSTITUTE OF PUBLIC HEALTH AND ENVIRONMENTAL PROTECTION (RIVM))	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / 1.8 mg/L / 3.2 mg/L / 5.6 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	NR-LETH (320 mg/L)	Mortality	Uninformative	5352369
79-00-5	48 Hour(s), (48 Hour(s))	<i>Chironomus riparius</i> (Midge), Larva, 3 Instar, Not Reported, Laboratory (REARED AT NATIONAL INSTITUTE OF PUBLIC HEALTH AND ENVIRONMENTAL PROTECTION (RIVM))	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / 1.8 mg/L / 3.2 mg/L / 5.6 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (147 (123-175) mg/L)	Mortality	Uninformative	5352369
79-00-5	48 Hour(s), (48 Hour(s))	<i>Chironomus riparius</i> (Midge), Larva, 3 Instar, Not Reported, Laboratory (REARED AT NATIONAL INSTITUTE OF PUBLIC HEALTH AND ENVIRONMENTAL PROTECTION (RIVM))	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / 1.8 mg/L / 3.2 mg/L / 5.6 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	NOEC (<31 mg/L)	Mortality	Uninformative	5352369

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	48 Hour(s), (48 Hour(s))	<i>Chironomus riparius</i> (Midge), Larva, 3 Instar, Not Reported, Laboratory (REARED AT NATIONAL INSTITUTE OF PUBLIC HEALTH AND ENVIRONMENTAL PROTECTION (RIVM))	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / 1.8 mg/L / 3.2 mg/L / 5.6 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Physiology (Physiology-Pigmentation, Response Site: Not reported)	NR (1.8-320 mg/L)	Skin and Connective Tissue	Uninformative	5352369
79-00-5	48 Hour(s), (48 Hour(s))	<i>Chironomus riparius</i> (Midge), Larva, 3 Instar, Not Reported, Laboratory (REARED AT NATIONAL INSTITUTE OF PUBLIC HEALTH AND ENVIRONMENTAL PROTECTION (RIVM))	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / 1.8 mg/L / 3.2 mg/L / 5.6 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Behavior (Behavior-Distance moved, change in direct movement, Response Site: Not reported)	NR (1.8-320 mg/L)	Behavioral	Uninformative	5352369
79-00-5	48 Hour(s), (48 Hour(s))	<i>Chironomus riparius</i> (Midge), Larva, 3 Instar, Not Reported, Laboratory (REARED AT NATIONAL INSTITUTE OF PUBLIC HEALTH AND ENVIRONMENTAL PROTECTION (RIVM))	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / 1.8 mg/L / 3.2 mg/L / 5.6 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Physiology (Intoxication-Immobile, Response Site: Not reported)	NR (1.8-320 mg/L)	Immobilization	Uninformative	5352369

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male and female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	LOEC (>130 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male and female, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	EC50 (>44 mg/kg dw sediment)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA female, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	EC20 (>44 mg/kg dw sediment)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA F1 generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Emergence, Response Site: Not reported)	EC20 (18 (13-27) mg/kg dw sediment)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male and female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Population (Population-Sex ratio, Response Site: Not reported)	LOEC (>7.5 mg/L)	Reproductive/Teratogenic	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male and female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Population (Population-Sex ratio, Response Site: Not reported)	LOEC (>130 mg/L)	Reproductive/Teratogenic	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC10 (>130 mg/L)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	NOEC (130 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male and female, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Population (Population-Sex ratio, Response Site: Not reported)	NOEC (44 mg/kg dw sediment)	Reproductive/Teratogenic	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male and female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Population (Population-Sex ratio, Response Site: Not reported)	NOEC (130 mg/L)	Reproductive/Teratogenic	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA F1 generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	EC20 (3.6 (2.4-5.2) mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA F1 generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	EC10 (2.5 (1.9-4.3) mg/L)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA F1 generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	LOEC (7.5 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA F1 generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	NOEC (3.8 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA F1 generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	EC50 (130 mg/L)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA F1 generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	EC20 (57 (33-85) mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA F1 generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	EC10 (37 (23-72) mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA F1 generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	EC50 (7.5 mg/L)	Development/Growth	High	10706027

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79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA F1 generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	LOEC (130 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA F1 generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Emergence, Response Site: Not reported)	EC10 (14 (8.3-21) mg/kg dw sediment)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	LOEC (>44 mg/kg dw sediment)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA female, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	NOEC (44 mg/kg dw sediment)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male and female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Population (Population-Sex ratio, Response Site: Not reported)	NOEC (7.5 mg/L)	Reproductive/Teratogenic	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male and female, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	EC10 (>44 mg/kg dw sediment)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	EC10 (>44 mg/kg dw sediment)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male and female, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	EC20 (>44 mg/kg dw sediment)	Development/Growth	High	10706027

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Aquatic: Arthropods Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WARHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male and female, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	NOEC (44 mg/kg dw sediment)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, 2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WARHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male and female, 1st generation	Unmeasured	0 mg/kg dw sediment / 8.1 mg/kg dw sediment / 27 mg/kg dw sediment / 90 mg/kg dw sediment / 300 mg/kg dw sediment / 1000 mg/kg dw sediment	Growth (Development-Emergence, Time to first emergence, Response Site: Not reported)	NR (8.1-1000 mg/kg dw sediment)	Development/Growth	Medium	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	NOEC (44 mg/kg dw sediment)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA female, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	LOEC (>44 mg/kg dw sediment)	Development/Growth	High	10706027

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Aquatic: Arthropods Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male and female, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	LOEC (>44 mg/kg dw sediment)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA female, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	EC50 (>44 mg/kg dw sediment)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA F1 generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Emergence, Response Site: Not reported)	NOEC (19 mg/kg dw sediment)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA female, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	EC10 (>44 mg/kg dw sediment)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA F1 generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Emergence, Response Site: Not reported)	EC50 (43 mg/kg dw sediment)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA F1 generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Emergence, Response Site: Not reported)	LOEC (44 mg/kg dw sediment)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	EC50 (>44 mg/kg dw sediment)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	EC20 (>44 mg/kg dw sediment)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: F1 generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA F1 generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	NOEC (66 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male and female, 1st generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Population (Population-Sex ratio, Response Site: Not reported)	LOEC (>44 mg/kg dw sediment)	Reproductive/Teratogenic	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male and female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	LOEC (>7.5 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male and female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC20 (>7.5 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC50 (>130 mg/L)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC20 (>130 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC10 (>130 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male and female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC50 (>7.5 mg/L)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC10 (>7.5 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	NOEC (130 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male and female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	NOEC (130 mg/L)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC50 (>7.5 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	NOEC (7.5 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC20 (>130 mg/L)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC50 (>7.5 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male and female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC10 (>130 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	LOEC (>130 mg/L)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	LOEC (>130 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC20 (>7.5 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC10 (>7.5 mg/L)	Development/Growth	High	10706027

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79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC50 (>130 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male and female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	NOEC (7.5 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	LOEC (>7.5 mg/L)	Development/Growth	High	10706027

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79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male and female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC20 (>130 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	NOEC (7.5 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male and female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC50 (>130 mg/L)	Development/Growth	High	10706027

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79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	LOEC (>7.5 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: male and female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male and female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC10 (>7.5 mg/L)	Development/Growth	High	10706027
79-00-5	2 Generation, (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch (Measured in: female, 1st generation), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 1st generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC20 (>7.5 mg/L)	Development/Growth	High	10706027

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79-00-5	24-48 Hour(s), (48 Hour(s))	<i>Chironomus riparius</i> (Midge), Larva, 3 Day(s), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, Not Reported	Unmeasured	0 mg/kg dw sediment / 100 mg/kg dw sediment / 1000 mg/kg dw sediment / 2500 mg/kg dw sediment	Physiology (Intoxication-Immobile, Response Site: Not reported)	NR (100-2500 mg/kg dw sediment)	Immobilization	Uninformative	10706027
79-00-5	24-48 Hour(s), (48 Hour(s))	<i>Chironomus riparius</i> (Midge), Larva, 3 Day(s), Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , Not Reported	Unmeasured	0 mg/L / 55 mg/L / 550 mg/L / 1200 mg/L	Physiology (Intoxication-Immobile, Response Site: Not reported)	NR (55-1200 mg/L)	Immobilization	Uninformative	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, 2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA female, 0th (parental) generation	Unmeasured	0 mg/kg dw sediment / 8.1 mg/kg dw sediment / 27 mg/kg dw sediment / 90 mg/kg dw sediment / 300 mg/kg dw sediment / 1000 mg/kg dw sediment	Reproduction (Reproduction-Fecundity,Fertility, Response Site: Not reported)	NR (8.1-1000 mg/kg dw sediment)	Reproductive/Teratogenic	Medium	10706027

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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, 2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male and female, 0th (parental) generation	Unmeasured	0 mg/kg dw sediment / 8.1 mg/kg dw sediment / 27 mg/kg dw sediment / 90 mg/kg dw sediment / 300 mg/kg dw sediment / 1000 mg/kg dw sediment	Growth (Development-Emergence, Time to first emergence, Response Site: Not reported)	NR (8.1-1000 mg/kg dw sediment)	Development/Growth	Medium	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male and female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	EC10 (>120 mg/L)	Development/Growth	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC10 (>120 mg/L)	Development/Growth	High	10706027

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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC50 (>120 mg/L)	Development/Growth	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	NOEC (6.4 mg/L)	Development/Growth	High	10706027

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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC20 (>6.4 mg/L)	Development/Growth	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	LOEC (>120 mg/L)	Development/Growth	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC10 (>120 mg/L)	Development/Growth	High	10706027

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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Reproduction (Reproduction-Fertility, Response Site: Not reported)	NOEC (120 mg/L)	Reproductive/Teratogenic	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	LOEC (>6.4 mg/L)	Development/Growth	High	10706027

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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male and female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	NOEC (6.4 mg/L)	Development/Growth	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	NOEC (120 mg/L)	Development/Growth	High	10706027

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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Reproduction (Reproduction-Fecundity, Response Site: Not reported)	EC10 (>120 mg/L)	Reproductive/Teratogenic	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male and female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	EC20 (>120 mg/L)	Development/Growth	High	10706027

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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male and female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	EC10 (>6.4 mg/L)	Development/Growth	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male and female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	EC20 (>6.4 mg/L)	Development/Growth	High	10706027
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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	LOEC (>120 mg/L)	Development/Growth	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	NOEC (120 mg/L)	Development/Growth	High	10706027

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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Reproduction (Reproduction-Fecundity, Response Site: Not reported)	EC20 (>6.4 mg/L)	Reproductive/Teratogenic	High	10706027
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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Reproduction (Reproduction-Fecundity, Response Site: Not reported)	EC20 (>120 mg/L)	Reproductive/Teratogenic	High	10706027
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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male, 0th (parental) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	EC10 (>30 mg/kg dw sediment)	Development/Growth	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male, 0th (parental) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	LOEC (>30 mg/kg dw sediment)	Development/Growth	High	10706027

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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male and female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Population (Population-Sex ratio, Response Site: Not reported)	LOEC (>120 mg/L)	Reproductive/Teratogenic	High	10706027

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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Reproduction (Reproduction-Fertility, Response Site: Not reported)	EC10 (>6.4 mg/L)	Reproductive/Teratogenic	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA male and female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Emergence, Response Site: Not reported)	NOEC (6.4 mg/L)	Development/Growth	High	10706027

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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male and female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Population (Population-Sex ratio, Response Site: Not reported)	LOEC (>6.4 mg/L)	Reproductive/Teratogenic	High	10706027

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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Reproduction (Reproduction-Fertility, Response Site: Not reported)	EC50 (>6.4 mg/L)	Reproductive/Teratogenic	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching , NA female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Reproduction (Reproduction-Fertility, Response Site: Not reported)	EC20 (>6.4 mg/L)	Reproductive/Teratogenic	High	10706027

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79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Reproduction (Reproduction-Fertility, Response Site: Not reported)	EC20 (>120 mg/L)	Reproductive/Teratogenic	High	10706027
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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA female, 0th (parental) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Reproduction (Reproduction-Fecundity, Response Site: Not reported)	EC50 (>30 mg/kg dw sediment)	Reproductive/Teratogenic	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA female, 0th (parental) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Reproduction (Reproduction-Fecundity, Response Site: Not reported)	EC10 (>30 mg/kg dw sediment)	Reproductive/Teratogenic	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC20 (>6.4 mg/L)	Development/Growth	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male and female, 0th (parental) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	EC10 (>30 mg/kg dw sediment)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA female, 0th (parental) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Reproduction (Reproduction-Fertility, Response Site: Not reported)	EC20 (>30 mg/kg dw sediment)	Reproductive/Teratogenic	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA female, 0th (parental) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Reproduction (Reproduction-Fertility, Response Site: Not reported)	LOEC (>30 mg/kg dw sediment)	Reproductive/Teratogenic	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male and female, 0th (parental) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	EC50 (>30 mg/kg dw sediment)	Development/Growth	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA female, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Reproduction (Reproduction-Fertility, Response Site: Not reported)	EC10 (>120 mg/L)	Reproductive/Teratogenic	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male and female, 0th (parent) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Emergence, Response Site: Not reported)	LOEC (>30 mg/kg dw sediment)	Development/Growth	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA female, 0th (parental) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Reproduction (Reproduction-Fecundity, Response Site: Not reported)	EC10 (>30 mg/kg dw sediment)	Reproductive/Teratogenic	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC10 (>6.4 mg/L)	Development/Growth	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male and female, 0th (parental) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Population (Population-Sex ratio, Response Site: Not reported)	NOEC (30 mg/kg dw sediment)	Reproductive/Teratogenic	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male and female, 0th (parental) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	LOEC (>30 mg/kg dw sediment)	Development/Growth	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA female, 0th (parental) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Reproduction (Reproduction-Fertility, Response Site: Not reported)	NOEC (30 mg/kg dw sediment)	Reproductive/Teratogenic	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA male, 0th (parental) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	EC50 (>30 mg/kg dw sediment)	Development/Growth	High	10706027
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Sediment, NA female, 0th (parental) generation	Measured	<0.50 mg/kg dw sediment / <0.50-13 mg/kg dw sediment / <0.50-20 mg/kg dw sediment / <0.50-52 mg/kg dw sediment / <0.50-73 mg/kg dw sediment / <0.50-170 mg/kg dw sediment	Growth (Development-Time to first emergence, Response Site: Not reported)	NOEC (30 mg/kg dw sediment)	Development/Growth	High	10706027

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	28 Day(s), (2 Generation)	<i>Chironomus riparius</i> (Midge), Larva, <=2 Days post-hatch, Not Reported, Laboratory (FROM SMITHERS LABORATORY CULTURE, WAREHAM, MASSACHUSETTS)	Fresh water, Aqueous (aquatic habitat), Leaching, NA male, 0th (parental) generation	Measured	<0.010 mg/L / <0.010-38 mg/L / <0.010-65 mg/L / <0.010-130 mg/L / <0.010-260 mg/L / <0.010-530 mg/L	Growth (Development-Time to first emergence, Response Site: Not reported)	EC50 (>6.4 mg/L)	Development/Growth	High	10706027
79-00-5	6 Hour(s), (6 Hour(s))	<i>Crangon crangon</i> (Sand Shrimp), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (43 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Crangon crangon</i> (Sand Shrimp), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (42 mg/L)	Mortality	Low	5352365
79-00-5	24 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), Neonate, 24 Hour(s), Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	EC50 (88 (73-109) mg/L)	Mortality	High	10609980
79-00-5	24 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), Neonate, 24 Hour(s), Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	EC50 (83 (69-102) mg/L)	Mortality	High	10609980

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	24 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), Neonate, 24 Hour(s), Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	EC50 (93 (73-120) mg/L)	Mortality	High	10609980
79-00-5	24 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), Neonate, 24 Hour(s), Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Static, 20 Organism	Unmeasured	0 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	NR-ZERO (32 mg/L)	Mortality	High	10609980
79-00-5	24 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), Neonate, 24 Hour(s), Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Static, 20 Organism	Unmeasured	0 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	NR-LETH (180 mg/L)	Mortality	High	10609980
79-00-5	24 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), Neonate, 24 Hour(s), Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	EC50 (88 (68-115) mg/L)	Mortality	High	10609980
79-00-5	48 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), Neonate, 24 Hour(s), Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	EC50 (76 (60-97) mg/L)	Mortality	High	10609980

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	48 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), Neonate, 24 Hour(s), Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	EC50 (80 (66-98) mg/L)	Mortality	High	10609980
79-00-5	48 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), Neonate, 24 Hour(s), Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	EC50 (78 (59-106) mg/L)	Mortality	High	10609980
79-00-5	48 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), Neonate, 24 Hour(s), Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / 10 mg/L / 18 mg/L / 32 mg/L / 56 mg/L / 100 mg/L / 180 mg/L / 320 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	EC50 (84 (65-108) mg/L)	Mortality	High	10609980
79-00-5	14 Day(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Not reported, Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, 20 Organism	Unmeasured	0 mg/L / 2.4 mg/L / 4.2 mg/L / 7.6 mg/L / 13.6 mg/L / 24 mg/L / 42 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	NR-ZERO (2.4 mg/L)	Mortality	Medium	10609980
79-00-5	14 Day(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Not reported, Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 mg/L / 2.4 mg/L / 4.2 mg/L / 7.6 mg/L / 13.6 mg/L / 24 mg/L / 42 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	EC50 (50 (38-73) mg/L)	Mortality	Medium	10609980

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CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	14 Day(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Not reported, Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 mg/L / 2.4 mg/L / 4.2 mg/L / 7.6 mg/L / 13.6 mg/L / 24 mg/L / 42 mg/L	Reproduction (Reproduction-Progeny counts/numbers, Response Site: Not reported)	EC50 (18 (13-27) mg/L)	Reproductive/Teratogenic	Medium	10609980
79-00-5	21 Day(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Not reported, Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 mg/L / 2.4 mg/L / 4.2 mg/L / 7.6 mg/L / 13.6 mg/L / 24 mg/L / 42 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	LOEC (4.2 mg/L)	Mortality	Medium	10609980
79-00-5	21 Day(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Not reported, Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 mg/L / 2.4 mg/L / 4.2 mg/L / 7.6 mg/L / 13.6 mg/L / 24 mg/L / 42 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	NOEC (2.4 mg/L)	Mortality	Medium	10609980
79-00-5	21 Day(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Not reported, Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 mg/L / 2.4 mg/L / 4.2 mg/L / 7.6 mg/L / 13.6 mg/L / 24 mg/L / 42 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	MATC (3.2 (2.4-4.2) mg/L)	Mortality	Medium	10609980
79-00-5	21 Day(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Not reported, Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 mg/L / 2.4 mg/L / 4.2 mg/L / 7.6 mg/L / 13.6 mg/L / 24 mg/L / 42 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	EC50 (42 (31-65) mg/L)	Mortality	Medium	10609980
79-00-5	21 Day(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Not reported, Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 mg/L / 2.4 mg/L / 4.2 mg/L / 7.6 mg/L / 13.6 mg/L / 24 mg/L / 42 mg/L	Reproduction (Reproduction-Progeny counts/numbers, Response Site: Not reported)	NOEC (2.4 mg/L)	Reproductive/Teratogenic	Medium	10609980

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Aquatic: Arthropods Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	21 Day(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Not reported, Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 mg/L / 2.4 mg/L / 4.2 mg/L / 7.6 mg/L / 13.6 mg/L / 24 mg/L / 42 mg/L	Reproduction (Reproduction-Progeny counts/numbers, Response Site: Not reported)	LOEC (4.2 mg/L)	Reproductive/Teratogenic	Medium	10609980
79-00-5	21 Day(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Not reported, Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 mg/L / 2.4 mg/L / 4.2 mg/L / 7.6 mg/L / 13.6 mg/L / 24 mg/L / 42 mg/L	Reproduction (Reproduction-Progeny counts/numbers, Response Site: Not reported)	MATC (3.2 (2.4-4.2) mg/L)	Reproductive/Teratogenic	Medium	10609980
79-00-5	21 Day(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Not reported, Not Reported, Laboratory (US EPA DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 mg/L / 2.4 mg/L / 4.2 mg/L / 7.6 mg/L / 13.6 mg/L / 24 mg/L / 42 mg/L	Reproduction (Reproduction-Progeny counts/numbers, Response Site: Not reported)	EC50 (24 (18-34) mg/L)	Reproductive/Teratogenic	Medium	10609980
79-00-5	24 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), 7 Day(s), Not Reported, Not reported	Fresh water, Aqueous (aquatic habitat), Static, 25 Organism	Measured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (75 mg/L)	Mortality	Low	5352364
79-00-5	24 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), 1 Day(s), Not Reported, Not reported	Fresh water, Aqueous (aquatic habitat), Static, 25 Organism	Measured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (43 mg/L)	Mortality	Low	5352364
79-00-5	24 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), 1 Day(s), Not Reported, Not reported	Fresh water, Aqueous (aquatic habitat), Static, 25 Organism	Measured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (44 mg/L)	Mortality	Low	5352364
79-00-5	24 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), 7 Day(s), Not Reported, Not reported	Fresh water, Aqueous (aquatic habitat), Static, 25 Organism	Measured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (70 mg/L)	Mortality	Low	5352364

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Aquatic: Arthropods Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	48 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), 1 Day(s), Not Reported, Not reported	Fresh water, Aqueous (aquatic habitat), Static, 25 Organism	Measured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (43 mg/L)	Mortality	Low	5352364
79-00-5	48 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), 7 Day(s), Not Reported, Not reported	Fresh water, Aqueous (aquatic habitat), Static, 25 Organism	Measured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (43 mg/L)	Mortality	Low	5352364
79-00-5	21 Day(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), 1 Day(s), Not Reported, Not reported	Fresh water, Aqueous (aquatic habitat), Renewal, 25 Organism	Measured	Not Coded	Reproduction (Reproduction-Reproduction, general, Response Site: Not reported)	NOEC (18 mg/L)	Reproductive/Teratogenic	Low	5352364
79-00-5	21 Day(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), 1 Day(s), Not Reported, Not reported	Fresh water, Aqueous (aquatic habitat), Renewal, 25 Organism	Measured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	NOEC (32 mg/L)	Mortality	Low	5352364
79-00-5	24 Hour(s), (7 Day(s))	<i>Daphnia magna</i> (Water Flea), Adult, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (72 mg/L)	Mortality	Low	5352365
79-00-5	24 Hour(s), (7 Day(s))	<i>Daphnia magna</i> (Water Flea), Larva, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (43 mg/L)	Mortality	Low	5352365
79-00-5	48 Hour(s), (7 Day(s))	<i>Daphnia magna</i> (Water Flea), Adult, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (43 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Daphnia magna</i> (Water Flea), Adult, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (43 mg/L)	Mortality	Low	5352365

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Aquatic: Arthropods Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	3 Week(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Larva, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Reproduction (Reproduction-Reproduction, general, Response Site: Not reported)	EC50 (32 mg/L)	Development/Growth	Low	5352365
79-00-5	3 Week(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Larva, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	NOEC (18 mg/L)	Mortality	Low	5352365
79-00-5	3 Week(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Larva, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (40 mg/L)	Mortality	Low	5352365
79-00-5	3 Week(s), (21 Day(s))	<i>Daphnia magna</i> (Water Flea), Larva, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Reproduction (Reproduction-Reproduction, general, Response Site: Not reported)	NOEC (18 mg/L)	Development/Growth	Low	5352365
79-00-5	24 Hour(s), (24 Hour(s))	<i>Daphnia magna</i> (Water Flea), 6-24 Hour(s), Not Reported, Not reported (NR)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Measured	Not Coded	Physiology (Intoxication-Immobile, Response Site: Not reported)	EC50 (23 ppm)	Immobilization	Low	660810
79-00-5	24 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), <=24 Hour(s), Not Reported, Laboratory (FROM LABORATORY STOCKS AT EG&G BIO-NOMICS)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (19 (14-26) mg/L)	Mortality	Medium	7508

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Aquatic: Arthropods Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	48 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), <=24 Hour(s), Not Reported, Laboratory (FROM LAB-ORATORY STOCKS AT EG&G BIO-NOMICS)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (18 (11-32) mg/L)	Mortality	Medium	7508
79-00-5	48 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), <=24 Hour(s), Not Reported, Laboratory (FROM LAB-ORATORY STOCKS AT EG&G BIO-NOMICS)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	NOEC (1.0 mg/L)	Mortality	Medium	7508
79-00-5	48 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), Instar, <24 Hour(s), Not Reported, Laboratory (LABORATORY STOCK REARED AT THE U.S. ENVIRONMENTAL PROTECTION AGENCY, DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / NR	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (170 (150-200) mg/L)	Mortality	Medium	3634174

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Aquatic: Arthropods Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	48 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), Instar, <24 Hour(s), Not Reported, Laboratory (LABORATORY STOCK REARED AT THE U.S. ENVIRONMENTAL PROTECTION AGENCY, DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / NR	Physiology (Intoxication-Immobile, Response Site: Not reported)	EC50 (78 (57-110) mg/L)	Immobilization	Medium	3634174
79-00-5	48 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), Instar, <24 Hour(s), Not Reported, Laboratory (LABORATORY STOCK REARED AT THE U.S. ENVIRONMENTAL PROTECTION AGENCY, DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / NR	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (190 (160-210) mg/L)	Mortality	Medium	3634174
79-00-5	48 Hour(s), (48 Hour(s))	<i>Daphnia magna</i> (Water Flea), Instar, <24 Hour(s), Not Reported, Laboratory (LABORATORY STOCK REARED AT THE U.S. ENVIRONMENTAL PROTECTION AGENCY, DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 mg/L / NR	Physiology (Intoxication-Immobile, Response Site: Not reported)	EC50 (81 (58-110) mg/L)	Immobilization	Medium	3634174

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Aquatic: Arthropods Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	28 Day(s), (28 Day(s))	<i>Daphnia magna</i> (Water Flea), Instar, <24 Hour(s), Not Reported, Laboratory (LABORATORY STOCK REARED AT THE U.S. ENVIRONMENTAL PROTECTION AGENCY, DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Measured	0 mg/L / 1.7 mg/L / 3.4 mg/L / 3.4 mg/L / 6.4 mg/L / 13 mg/L / 26 mg/L / 42 mg/L	Growth (Growth-Length, Response Site: Whole organism)	LOEC (26 mg/L)	Development/Growth	High	3634174
79-00-5	28 Day(s), (28 Day(s))	<i>Daphnia magna</i> (Water Flea), Instar, <24 Hour(s), Not Reported, Laboratory (LABORATORY STOCK REARED AT THE U.S. ENVIRONMENTAL PROTECTION AGENCY, DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Measured	0 mg/L / 1.7 mg/L / 3.4 mg/L / 3.4 mg/L / 6.4 mg/L / 13 mg/L / 26 mg/L / 42 mg/L	Growth (Growth-Length, Response Site: Whole organism)	NOEC (13 mg/L)	Development/Growth	High	3634174
79-00-5	28 Day(s), (28 Day(s))	<i>Daphnia magna</i> (Water Flea), Instar, <24 Hour(s), Not Reported, Laboratory (LABORATORY STOCK REARED AT THE U.S. ENVIRONMENTAL PROTECTION AGENCY, DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Measured	0 mg/L / 1.7 mg/L / 3.4 mg/L / 3.4 mg/L / 6.4 mg/L / 13 mg/L / 26 mg/L / 42 mg/L	Reproduction (Reproduction-Fecundity, Response Site: Not reported)	LOEC (42 mg/L)	Reproductive/Teratogenic	High	3634174

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Aquatic: Arthropods Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	28 Day(s), (28 Day(s))	<i>Daphnia magna</i> (Water Flea), Instar, <24 Hour(s), Not Reported, Laboratory (LABORATORY STOCK REARED AT THE U.S. ENVIRONMENTAL PROTECTION AGENCY, DULUTH, MN)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Measured	0 mg/L / 1.7 mg/L / 3.4 mg/L / 6.4 mg/L / 13 mg/L / 26 mg/L / 42 mg/L	Reproduction (Reproduction-Fecundity, Response Site: Not reported)	NOEC (26 mg/L)	Reproductive/Teratogenic	High	3634174
79-00-5	6 Hour(s), (6 Hour(s))	<i>Palaemonetes varians</i> (Grass Or Atlantic Ditch Shrimp), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (43 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Palaemonetes varians</i> (Grass Or Atlantic Ditch Shrimp), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (43 mg/L)	Mortality	Low	5352365
79-00-5	96 Hour(s), (96 Hour(s))	<i>Temora longicornis</i> (Calanoid Copepod), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (43 mg/L)	Mortality	Low	5352365

* If multiple extractions contained all identical information except the effect level, extraction rows were collapsed and the differing levels are listed by comma in this row.

Aquatic: Fish Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	12 Hour(s), (96 Hour(s))	<i>Jordanella floridae</i> (Flagfish), Juvenile, 2-4 Month(s), Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Unmeasured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (72565 ug/L)	Mortality	High	95201
79-00-5	24 Hour(s), (96 Hour(s))	<i>Jordanella floridae</i> (Flagfish), Juvenile, 2-4 Month(s), Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Unmeasured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (63591 ug/L)	Mortality	High	95201
79-00-5	36 Hour(s), (96 Hour(s))	<i>Jordanella floridae</i> (Flagfish), Juvenile, 2-4 Month(s), Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Unmeasured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (58749 ug/L)	Mortality	High	95201
79-00-5	48 Hour(s), (96 Hour(s))	<i>Jordanella floridae</i> (Flagfish), Juvenile, 2-4 Month(s), Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Unmeasured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (54275 ug/L)	Mortality	High	95201
79-00-5	72 Hour(s), (96 Hour(s))	<i>Jordanella floridae</i> (Flagfish), Juvenile, 2-4 Month(s), Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Unmeasured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (50142 ug/L)	Mortality	High	95201
79-00-5	96 Hour(s), (96 Hour(s))	<i>Jordanella floridae</i> (Flagfish), Juvenile, 2-4 Month(s), Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (89100 (66600-110000) ug/L)	Mortality	High	95201
79-00-5	96 Hour(s), (96 Hour(s))	<i>Jordanella floridae</i> (Flagfish), Juvenile, 2-4 Month(s), Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Unmeasured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (45117 (42000-48500) ug/L)	Mortality	High	95201

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Aquatic: Fish Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	10 Day(s), (28 Day(s))	<i>Jordanella floridae</i> (Flagfish), Egg, <24 Hour(s), Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	0 ug/L / 0 ug/L / 4030 ug/L / 6804 ug/L / 8204 ug/L / 18160 ug/L / 53477 ug/L	Mortality (Mortality-Survival, Response Site: Not reported)	LOEC (53477 mg/L)	Mortality	High	95201
79-00-5	10 Day(s), (28 Day(s))	<i>Jordanella floridae</i> (Flagfish), Egg, <24 Hour(s), Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	0 ug/L / 0 ug/L / 4030 ug/L / 6804 ug/L / 8204 ug/L / 18160 ug/L / 53477 ug/L	Mortality (Mortality-Survival, Response Site: Not reported)	NOEC (18160 mg/L)	Mortality	High	95201
79-00-5	28 Day(s), (28 Day(s))	<i>Jordanella floridae</i> (Flagfish), Egg, <24 Hour(s), Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	0 ug/L / 0 ug/L / 4030 ug/L / 6804 ug/L / 8204 ug/L / 18160 ug/L / 53477 ug/L	Mortality (Mortality-Mortality, Response Site: Not reported)	NOEC (53477 mg/L)	Mortality	High	95201
79-00-5	28 Day(s), (28 Day(s))	<i>Jordanella floridae</i> (Flagfish), Fry, 1 Week(s), Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	0 ug/L / 0 ug/L / 6599 ug/L / 10756 ug/L / 15621 ug/L / 29032 ug/L / 74827 ug/L	Growth (Growth-Weight, Response Site: Whole organism)	NOEC (29032 mg/L)	Development/Growth	High	95201
79-00-5	28 Day(s), (28 Day(s))	<i>Jordanella floridae</i> (Flagfish), Fry, 1 Week(s), Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	0 ug/L / 0 ug/L / 6599 ug/L / 10756 ug/L / 15621 ug/L / 29032 ug/L / 74827 ug/L	Mortality (Mortality-Survival, Response Site: Not reported)	LOEC (74827 mg/L)	Mortality	High	95201
79-00-5	28 Day(s), (28 Day(s))	<i>Jordanella floridae</i> (Flagfish), Fry, 1 Week(s), Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	0 ug/L / 0 ug/L / 6599 ug/L / 10756 ug/L / 15621 ug/L / 29032 ug/L / 74827 ug/L	Mortality (Mortality-Survival, Response Site: Not reported)	NOEC (29032 mg/L)	Mortality	High	95201

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Aquatic: Fish Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	24 Hour(s), (96 Hour(s))	<i>Lepomis macrochirus</i> (Bluegill), Young of year, Not Reported, Laboratory (FROM COMMERCIAL FISH SUPPLIERS)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (40 AI mg/L)	Mortality	Low	18064
79-00-5	96 Hour(s), (96 Hour(s))	<i>Lepomis macrochirus</i> (Bluegill), Young of year, Not Reported, Laboratory (FROM COMMERCIAL FISH SUPPLIERS)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (40 (35-47) AI mg/L)	Mortality	Low	18064
79-00-5	1 Hour(s), (1 Hour(s))	<i>Oncorhynchus mykiss</i> (Rainbow Trout), Fingerling, Not Reported, Laboratory (LOCAL SOUTHERN ONTARIO FISH HATCHERY)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Unmeasured	0 ug/L / 0 ug/L / 5 ug/L / 10 ug/L	Physiology (Physiology-Cough, Response Site: Not reported)	NR (5-10 ug/L)	Respiratory	High	4840530
79-00-5	1 Hour(s), (1 Hour(s))	<i>Oncorhynchus mykiss</i> (Rainbow Trout), Fingerling, Not Reported, Laboratory (LOCAL SOUTHERN ONTARIO FISH HATCHERY)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Unmeasured	0 ug/L / 0 ug/L / 5 ug/L / 10 ug/L	Behavior (Behavior-Distance moved, change in direct movement, Response Site: Not reported)	NR (5-10 ug/L)	Behavioral	High	4840530

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Aquatic: Fish Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	1 Hour(s), (1 Hour(s))	<i>Oncorhynchus mykiss</i> (Rainbow Trout), Fingerling, Not Reported, Laboratory (LO-CAL SOUTH-ERN ONTARIO FISH HATCH-ERY)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Unmeasured	0 ug/L / 0 ug/L / 5 ug/L / 10 ug/L	Physiology (Physiology-Ventilation, Response Site: Not reported)	NR (5-10 ug/L)	Respiratory	High	4840530
79-00-5	32 Day(s), (32 Day(s))	<i>Pimephales promelas</i> (Fathead Minnow), Larva, 30-35 Day(s), Not Reported, Laboratory (NR)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	50 ug/L / 2000 ug/L / 6000 ug/L / 14800 ug/L / 48300 ug/L / 147000 ug/L	Mortality (Mortality-Survival, Response Site: Not reported)	LOEC (48300 ug/L)	Mortality	High	7494661
79-00-5	32 Day(s), (32 Day(s))	<i>Pimephales promelas</i> (Fathead Minnow), Larva, 30-35 Day(s), Not Reported, Laboratory (NR)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	50 ug/L / 2000 ug/L / 6000 ug/L / 14800 ug/L / 48300 ug/L / 147000 ug/L	Growth (Growth-Weight, Response Site: Whole organism)	MATC (6000-14800 ug/L)	Development/Growth	High	7494661
79-00-5	32 Day(s), (32 Day(s))	<i>Pimephales promelas</i> (Fathead Minnow), Larva, 30-35 Day(s), Not Reported, Laboratory (NR)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	50 ug/L / 2000 ug/L / 6000 ug/L / 14800 ug/L / 48300 ug/L / 147000 ug/L	Growth (Growth-Weight, Response Site: Whole organism)	NOEC (6000 ug/L)	Development/Growth	High	7494661
79-00-5	32 Day(s), (32 Day(s))	<i>Pimephales promelas</i> (Fathead Minnow), Larva, 30-35 Day(s), Not Reported, Laboratory (NR)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	50 ug/L / 2000 ug/L / 6000 ug/L / 14800 ug/L / 48300 ug/L / 147000 ug/L	Mortality (Mortality-Survival, Response Site: Not reported)	NOEC (14800 ug/L)	Mortality	High	7494661
79-00-5	32 Day(s), (32 Day(s))	<i>Pimephales promelas</i> (Fathead Minnow), Larva, 30-35 Day(s), Not Reported, Laboratory (NR)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	50 ug/L / 2000 ug/L / 6000 ug/L / 14800 ug/L / 48300 ug/L / 147000 ug/L	Mortality (Mortality-Mortality, Response Site: Not reported)	NR-LETH (147000 ug/L)	Mortality	High	7494661

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Aquatic: Fish Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	32 Day(s), (32 Day(s))	<i>Pimephales promelas</i> (Fathead Minnow), Larva, 30-35 Day(s), Not Reported, Laboratory (NR)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	50 ug/L / 2000 ug/L / 6000 ug/L / 14800 ug/L / 48300 ug/L / 147000 ug/L	Growth (Growth-Weight, Response Site: Whole organism)	LOEC (14800 ug/L)	Development/Growth	High	7494661
79-00-5	1 Hour(s), (96 Hour(s))	<i>Pimephales promelas</i> (Fathead Minnow), 31 Day(s), Not Reported, Laboratory (US EPA ENVIRONMENTAL RESEARCH LABORATORY DULUTH AND THE UNIVERSITY OF WISCONSIN SUPERIOR)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	<0.01-<0.05 mg/L / 32.6-40.0 mg/L / 51.4-68.4 mg/L / 95.0-119 mg/L / 152-203 mg/L / 219-286 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (>105-<152.5 mg/L)	Mortality	High	32169
79-00-5	24 Hour(s), (96 Hour(s))	<i>Pimephales promelas</i> (Fathead Minnow), 31 Day(s), Not Reported, Laboratory (US EPA ENVIRONMENTAL RESEARCH LABORATORY DULUTH AND THE UNIVERSITY OF WISCONSIN SUPERIOR)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	<0.01-<0.05 mg/L / 32.6-40.0 mg/L / 51.4-68.4 mg/L / 95.0-119 mg/L / 152-203 mg/L / 219-286 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (>57.5-<105 mg/L)	Mortality	High	32169

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Aquatic: Fish Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	96 Hour(s), (96 Hour(s))	<i>Pimephales promelas</i> (Fat-head Minnow), 31 Day(s), Not Reported, Laboratory (US EPA ENVIRONMENTAL RESEARCH LABORATORY DULUTH AND THE UNIVERSITY OF WISCONSIN SUPERIOR)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	<0.01-<0.05 mg/L / 32.6-40.0 mg/L / 51.4-68.4 mg/L / 95.0-119 mg/L / 152-203 mg/L / 219-286 mg/L	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (81.6 mg/L)	Mortality	High	32169
79-00-5	24 Hour(s), (96 Hour(s))	<i>Pimephales promelas</i> (Fat-head Minnow), 30-35 Day(s), Not Reported, Laboratory (LABORATORY-REARED)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (81.6 (60.9-109) mg/L)	Mortality	Medium	4259619
79-00-5	48 Hour(s), (96 Hour(s))	<i>Pimephales promelas</i> (Fat-head Minnow), 30-35 Day(s), Not Reported, Laboratory (LABORATORY-REARED)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (81.6 (60.9-109) mg/L)	Mortality	Medium	4259619
79-00-5	72 Hour(s), (96 Hour(s))	<i>Pimephales promelas</i> (Fat-head Minnow), 30-35 Day(s), Not Reported, Laboratory (LABORATORY-REARED)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (81.6 (60.9-109) mg/L)	Mortality	Medium	4259619

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Aquatic: Fish Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	96 Hour(s), (96 Hour(s))	<i>Pimephales promelas</i> (Fat-head Minnow), 30-35 Day(s), Not Reported, Laboratory (LABORATORY-REARED)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	Not Coded	Physiology (Intoxication-Intoxication, general, Response Site: Not reported)	NR (NR)	Behavioral	Uninformative	4259619
79-00-5	96 Hour(s), (96 Hour(s))	<i>Pimephales promelas</i> (Fat-head Minnow), 30-35 Day(s), Not Reported, Laboratory (LABORATORY-REARED)	Fresh water, Aqueous (aquatic habitat), Flow-through, Not Reported	Measured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (81.6 (60.9-109) mg/L)	Mortality	Medium	4259619
79-00-5	7 Hour(s), (7 Day(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Egg, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (6.0 mg/L)	Mortality	Low	5352365
79-00-5	48 Hour(s), (7 Day(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Larva, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (60 mg/L)	Mortality	Low	5352365
79-00-5	48 Hour(s), (7 Day(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Larva, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (34 mg/L)	Mortality	Low	5352365
79-00-5	48 Hour(s), (7 Day(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Larva, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (45 mg/L)	Mortality	Low	5352365
79-00-5	48 Hour(s), (7 Day(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Egg, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (125 mg/L)	Mortality	Low	5352365

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Aquatic: Fish Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	96 Hour(s), (7 Day(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Larva, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (55 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Larva, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (55 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Larva, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (27 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Larva, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (36 mg/L)	Mortality	Low	5352365
79-00-5	4 Week(s), (8-12 Week(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Egg, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (5.5 mg/L)	Mortality	Low	5352365
79-00-5	8 Week(s), (8-12 Week(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Egg, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Growth (Growth-Growth, general, Response Site: Not reported)	LOEC (10 mg/L)	Development/Growth	Low	5352365
79-00-5	8 Week(s), (8-12 Week(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Egg, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Growth (Morphology-Abnormal, Response Site: Not reported)	LOEC (10 mg/L)	Development/Growth	Low	5352365
79-00-5	8 Week(s), (8-12 Week(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Egg, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LOEC (10 mg/L)	Mortality	Low	5352365

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Aquatic: Fish Extraction Table										
CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	8 Week(s), (8-12 Week(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Egg, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (5.5 mg/L)	Mortality	Low	5352365
79-00-5	8 Week(s), (8-12 Week(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Egg, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	NOEC (3.0 mg/L)	Mortality	Low	5352365
79-00-5	8 Week(s), (8-12 Week(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Egg, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Growth (Morphology-Abnormal, Response Site: Not reported)	NOEC (3.0 mg/L)	Development/Growth	Low	5352365
79-00-5	8 Week(s), (8-12 Week(s))	<i>Pleuronectes platessa</i> (Plaice, Sand Dab), Egg, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Growth (Growth-Growth, general, Response Site: Not reported)	NOEC (3.0 mg/L)	Development/Growth	Low	5352365
79-00-5	24 Hour(s), (7 Day(s))	<i>Poecilia reticulata</i> (Guppy), Adult, Not Reported, Laboratory (BOUGHT)	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (70 mg/L)	Mortality	Low	5352365
79-00-5	24 Hour(s), (7 Day(s))	<i>Poecilia reticulata</i> (Guppy), Young, Not Reported, Laboratory (BOUGHT)	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (72 mg/L)	Mortality	Low	5352365
79-00-5	24 Hour(s), (7 Day(s))	<i>Poecilia reticulata</i> (Guppy), Young, Not Reported, Laboratory (LAB CULTURED)	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (72 mg/L)	Mortality	Low	5352365
79-00-5	24 Hour(s), (7 Day(s))	<i>Poecilia reticulata</i> (Guppy), Young, Not Reported, Laboratory (LAB CULTURED)	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (43 mg/L)	Mortality	Low	5352365

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Aquatic: Fish Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	24 Hour(s), (7 Day(s))	<i>Poecilia reticulata</i> (Guppy), Adult, Not Reported, Laboratory (BOUGHT)	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (85 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Poecilia reticulata</i> (Guppy), Adult, Not Reported, Laboratory (BOUGHT)	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (45 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Poecilia reticulata</i> (Guppy), Adult, Not Reported, Laboratory (BOUGHT)	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (75 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Poecilia reticulata</i> (Guppy), Young, Not Reported, Laboratory (BOUGHT)	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (70 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Poecilia reticulata</i> (Guppy), Young, Not Reported, Laboratory (LAB CULTURED)	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (40 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Poecilia reticulata</i> (Guppy), Young, Not Reported, Laboratory (LAB CULTURED)	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (70 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Poecilia reticulata</i> (Guppy), 2-3 Month(s), Not Reported, Laboratory (NR)	Fresh water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	(log)LC50 (2.85 umol/L)	Mortality	Uninformative	3684127
79-00-5	24 Hour(s), (24 Hour(s))	<i>Pomatoschistus minutus</i> (Sand Goby), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (43 mg/L)	Mortality	Low	5352365

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Aquatic: Fish Extraction Table										
CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	7 Day(s), (7 Day(s))	<i>Pomatoschistus minutus</i> (Sand Goby), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (43 mg/L)	Mortality	Low	5352365

* If multiple extractions contained all identical information except the effect level, extraction rows were collapsed and the differing levels are listed by comma in this row.

Aquatic: Non-vascular plants Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	72 Hour(s), (72 Hour(s))	<i>Chlamydomonas reinhardtii</i> (Green Algae), Exponential growth phase (log), 7 Day(s), Not Reported, Laboratory (UNIVERSITY OF GOTTINGEN, GERMANY)	Culture, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Population (Population-Biomass, Response Site: Not reported)	EC10 (26.3 (21.0-30.4) mg/L)	Development/Growth	High	661061
79-00-5	72 Hour(s), (72 Hour(s))	<i>Chlamydomonas reinhardtii</i> (Green Algae), Exponential growth phase (log), 7 Day(s), Not Reported, Laboratory (UNIVERSITY OF GOTTINGEN, GERMANY)	Culture, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Population (Population-Biomass, Response Site: Not reported)	EC50 (57.0 (54.0-60.6) mg/L)	Development/Growth	High	661061
79-00-5	96 Hour(s), (96 Hour(s))	<i>Chlamydomonas sp.</i> (Green Algae), Not reported, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Growth (Growth-Growth, general, Response Site: Not reported)	EC50 (260 mg/L)	Development/Growth	Low	5352365
79-00-5	96 Hour(s), (96 Hour(s))	<i>Chlorella ovalis</i> (Green Algae), Not reported, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Growth (Growth-Growth, general, Response Site: Not reported)	EC50 (200 mg/L)	Development/Growth	Low	5352365
79-00-5	96 Hour(s), (96 Hour(s))	<i>Chlorella pyrenoidosa</i> (Green Algae), Not reported, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Growth (Growth-Growth, general, Response Site: Not reported)	EC50 (170 mg/L)	Development/Growth	Low	5352365

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Aquatic: Non-vascular plants Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	96 Hour(s), (96 Hour(s))	<i>Desmodemus subspicatus</i> (Green Algae), Not reported, Not Reported, Laboratory (OBTAINED FROM PFLANZEN-PHYSIOLOGISCHES INSTITUT DER UNIVERSITÄT GÖTTINGEN (SAG) (GERMANY))	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	Not Coded	Population (Population-Abundance, Response Site: Not reported)	EC50 (167 ppm)	Development/Growth	Uninformative	10214703
79-00-5	96 Hour(s), (96 Hour(s))	<i>Desmodemus subspicatus</i> (Green Algae), Not reported, Not Reported, Laboratory (OBTAINED FROM PFLANZEN-PHYSIOLOGISCHES INSTITUT DER UNIVERSITÄT GÖTTINGEN (SAG) (GERMANY))	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	Not Coded	Population (Population-Abundance, Response Site: Not reported)	EC50 (198 ppm)	Development/Growth	Uninformative	10214703
79-00-5	72 Hour(s), (96 Hour(s))	<i>Desmodemus subspicatus</i> (Green Algae), Not reported, Not Reported, Laboratory (FROM A CONTINUOUSLY IRRADIATED ALGAE CULTURE)	Fresh water, Aqueous (aquatic habitat), Static, Not Reported	Measured	Not Coded	Population (Population-Abundance, Response Site: Not reported)	EC50 (200 ppm)	Development/Growth	Low	660810
79-00-5	96 Hour(s), (96 Hour(s))	<i>Dunaliella sp.</i> (Green Algae), Not reported, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Growth (Growth-Growth, general, Response Site: Not reported)	EC50 (200 mg/L)	Development/Growth	Low	5352365

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Aquatic: Non-vascular plants Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	96 Hour(s), (96 Hour(s))	<i>Phaeodactylum tricornutum</i> (Diatom), Not reported, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Growth (Growth-Growth, general, Response Site: Not reported)	EC50 (60 mg/L)	Development/Growth	Low	5352365
79-00-5	48 Hour(s), (48 Hour(s))	<i>Raphidocelis subcapitata</i> (Green Algae), Not reported, Not Reported, Laboratory (NR)	Culture, Aqueous (aquatic habitat), Static, Not Reported	Chemical analysis reported	NR / NR	Physiology (Physiology-Respiration, Response Site: Not reported)	EC50 (129.3 (112.1-149.1) mg/L)	Respiratory	Uninformative	4141189
79-00-5	48 Hour(s), (48 Hour(s))	<i>Raphidocelis subcapitata</i> (Green Algae), Not reported, Not Reported, Laboratory (NR)	Culture, Aqueous (aquatic habitat), Static, Not Reported	Chemical analysis reported	NR / NR	Growth (Growth-Growth rate, Response Site: Not reported)	(log)EC50 (-0.08 mmol/L)	Development/Growth	Uninformative	4141189
79-00-5	48 Hour(s), (48 Hour(s))	<i>Raphidocelis subcapitata</i> (Green Algae), Not reported, Not Reported, Laboratory (NR)	Culture, Aqueous (aquatic habitat), Static, Not Reported	Chemical analysis reported	NR / NR	Physiology (Physiology-Respiration, Response Site: Not reported)	(log)EC50 (0.01 mmol/L)	Respiratory	Uninformative	4141189
79-00-5	48 Hour(s), (48 Hour(s))	<i>Raphidocelis subcapitata</i> (Green Algae), Not reported, Not Reported, Laboratory (NR)	Culture, Aqueous (aquatic habitat), Static, Not Reported	Chemical analysis reported	NR / NR	Growth (Growth-Growth rate, Response Site: Not reported)	EC50 (160.4 (146.9-177.4) mg/L)	Development/Growth	Uninformative	4141189
79-00-5	48 Hour(s), (48 Hour(s))	<i>Raphidocelis subcapitata</i> (Green Algae), Not reported, Not Reported, Laboratory (UNIVERSITY OF TEXAS AT AUSTIN, TX, USA)	Culture, Aqueous (aquatic habitat), Static, Not Reported	Chemical analysis reported	NR / NR	Population (Population-Population growth rate, Response Site: Not reported)	EC50 (105.42 mg/L)	Development/Growth	Uninformative	3617867

* If multiple extractions contained all identical information except the effect level, extraction rows were collapsed and the differing levels are listed by comma in this row.

Aquatic: Mollusks Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	7 Day(s), (7 Day(s))	<i>Crepidula fornicata</i> (Slipper Limpet), Veliger, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (170 mg/L)	Mortality	Low	5352365
79-00-5	96 Hour(s), (96 Hour(s))	<i>Dreissena polymorpha</i> (Zebra Mussel), Adult, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (320 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Dreissena polymorpha</i> (Zebra Mussel), Adult, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (190 mg/L)	Mortality	Low	5352365
79-00-5	14 Day(s), (14 Day(s))	<i>Dreissena polymorpha</i> (Zebra Mussel), Adult, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (140 mg/L)	Mortality	Low	5352365
79-00-5	96 Hour(s), (7 Day(s))	<i>Lymnaea stagnalis</i> (Great Pond Snail), Egg, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (170 mg/L)	Mortality	Low	5352365
79-00-5	16 Day(s), (16 Day(s))	<i>Lymnaea stagnalis</i> (Great Pond Snail), Egg, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Hatch, Response Site: Not reported)	NOEC (10 mg/L)	Mortality	Low	5352365
79-00-5	16 Day(s), (16 Day(s))	<i>Lymnaea stagnalis</i> (Great Pond Snail), Egg, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Growth (Morphology-General morphological changes, Response Site: Not reported)	NOEC (10 mg/L)	Development/Growth	Low	5352365
79-00-5	16 Day(s), (16 Day(s))	<i>Lymnaea stagnalis</i> (Great Pond Snail), Egg, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Hatch, Response Site: Not reported)	EC50 (36 mg/L)	Mortality	Low	5352365

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Aquatic: Mollusks Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	16 Day(s), (16 Day(s))	<i>Lymnaea stagnalis</i> (Great Pond Snail), Egg, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Growth (Morphology-General morphological changes, Response Site: Not reported)	EC50 (36 mg/L)	Development/Growth	Low	5352365
79-00-5	16 Day(s), (16 Day(s))	<i>Lymnaea stagnalis</i> (Great Pond Snail), Egg, Not Reported, Laboratory	Fresh water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (58 mg/L)	Mortality	Low	5352365
79-00-5	96 Hour(s), (96 Hour(s))	<i>Mytilus edulis</i> (Common Bay Mussel, Blue Mussel), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (110 mg/L)	Mortality	Low	5352365
79-00-5	7 Day(s), (7 Day(s))	<i>Mytilus edulis</i> (Common Bay Mussel, Blue Mussel), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (80 mg/L)	Mortality	Low	5352365
79-00-5	14 Day(s), (14 Day(s))	<i>Mytilus edulis</i> (Common Bay Mussel, Blue Mussel), Adult, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (65 mg/L)	Mortality	Low	5352365

* If multiple extractions contained all identical information except the effect level, extraction rows were collapsed and the differing levels are listed by comma in this row.

Aquatic: Worms Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	96 Hour(s), (7 Day(s))	<i>Ophryotrocha diadema</i> (Polychaete), Adult, 4 Week(s), Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Not reported, Not Reported	Chemical analysis reported	Not Coded	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (190 mg/L)	Mortality	Low	5352365
79-00-5	NA Until hatch, (NA Until hatch)	<i>Ophryotrocha labronica</i> (Polychaete), Adult, Both, Laboratory	Salt water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 ppm / 25 ppm / 50 ppm / 75 ppm / 100 ppm / 150 ppm / 200 ppm	Reproduction (Reproduction-Hatch, Response Site: Not reported)	NR (25-200 ppm)	Reproductive/Teratogenic	High	5442093
79-00-5	24 Hour(s), (216 Hour(s))	<i>Ophryotrocha labronica</i> (Polychaete), Not reported, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 ppm / 100 ppm / 150 ppm / 200 ppm / 250 ppm / 300 ppm / 400 ppm / 600 ppm / 800 ppm / 1000 ppm / 2000 ppm	Mortality (Mortality-Mortality, Response Site: Not reported)	NR-LETH (200 ppm)	Mortality	Uninformative	5442093
79-00-5	96 Hour(s), (216 Hour(s))	<i>Ophryotrocha labronica</i> (Polychaete), Not reported, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 ppm / 100 ppm / 150 ppm / 200 ppm / 250 ppm / 300 ppm / 400 ppm / 600 ppm / 800 ppm / 1000 ppm / 2000 ppm	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (500 ppm)	Mortality	Uninformative	5442093

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Aquatic: Worms Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	96 Hour(s), (216 Hour(s))	<i>Ophryotrocha labronica</i> (Polychaete), Not reported, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 ppm / 100 ppm / 150 ppm / 200 ppm / 250 ppm / 300 ppm / 400 ppm / 600 ppm / 800 ppm / 1000 ppm / 2000 ppm	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (160 ppm)	Mortality	Uninformative	5442093
79-00-5	144 Hour(s), (216 Hour(s))	<i>Ophryotrocha labronica</i> (Polychaete), Not reported, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 ppm / 100 ppm / 150 ppm / 200 ppm / 250 ppm / 300 ppm / 400 ppm / 600 ppm / 800 ppm / 1000 ppm / 2000 ppm	Mortality (Mortality-Mortality, Response Site: Not reported)	NR-LETH (600 ppm)	Mortality	Uninformative	5442093
79-00-5	216 Hour(s), (216 Hour(s))	<i>Ophryotrocha labronica</i> (Polychaete), Not reported, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 ppm / 100 ppm / 150 ppm / 200 ppm / 250 ppm / 300 ppm / 400 ppm / 600 ppm / 800 ppm / 1000 ppm / 2000 ppm	Behavior (Behavior-Activity, general, Response Site: Not reported)	NR (100-600 ppm)	Behavioral	Uninformative	5442093
79-00-5	216 Hour(s), (216 Hour(s))	<i>Ophryotrocha labronica</i> (Polychaete), Not reported, Not Reported, Laboratory	Salt water, Aqueous (aquatic habitat), Renewal, Not Reported	Unmeasured	0 ppm / 100 ppm / 150 ppm / 200 ppm / 250 ppm / 300 ppm / 400 ppm / 600 ppm / 800 ppm / 1000 ppm / 2000 ppm	Mortality (Mortality-Mortality, Response Site: Not reported)	NR-ZERO (400 ppm)	Mortality	Uninformative	5442093

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Aquatic: Worms Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	~15 Day(s), (NA Until hatch)	<i>Ophryotrocha labronica</i> (Polychaete), Adult, Both, Laboratory	Salt water, Aqueous (aquatic habitat), Static, Not Reported	Unmeasured	0 ppm / 25 ppm / 50 ppm / 75 ppm / 100 ppm / 150 ppm / 200 ppm	Reproduction (Reproduction-Progeny counts/numbers, Response Site: Not reported)	NR (25-200 ppm)	Reproductive/Teratogenic	High	5442093

* If multiple extractions contained all identical information except the effect level, extraction rows were collapsed and the differing levels are listed by comma in this row.

Terrestrial: Vascular plants Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2 Week(s), (2 Week(s))	<i>Populus x canadensis</i> (Canadian Poplar), Not reported, Not Reported, Laboratory (HRAMOR NURSERY, MANISTEE, MI)	Aqueous, Environmental, Hydroponic, Not Reported	Measured	0 mM / 0.7 mM / 1.5 mM / 2.3 mM / 3.2 mM	Physiology (Physiology-Transpiration, Response Site: Not reported)	EC50 (253 mg/L)	Respiratory	Medium	42313
79-00-5	2 Week(s), (2 Week(s))	<i>Populus x canadensis</i> (Canadian Poplar), Not reported, Not Reported, Laboratory (HRAMOR NURSERY, MANISTEE, MI)	Aqueous, Environmental, Hydroponic, Not Reported	Measured	0 mM / 0.7 mM / 1.5 mM / 2.3 mM / 3.2 mM	Growth (Growth-Weight, Response Site: Whole organism)	EC0 (307 mg/L)	Development/Growth	Medium	42313
79-00-5	0-2 Week(s), (2 Week(s))	<i>Populus x canadensis</i> (Canadian Poplar), Not reported, Not Reported, Laboratory (HRAMOR NURSERY, MANISTEE, MI)	Aqueous, Environmental, Hydroponic, Not Reported	Measured	0 mM / 0.7 mM / 1.5 mM / 2.3 mM / 3.2 mM	Growth (Growth-Weight, Response Site: Whole organism)	NR (0.7-3.2 mM)	Development/Growth	Medium	42313

* If multiple extractions contained all identical information except the effect level, extraction rows were collapsed and the differing levels are listed by comma in this row.

Terrestrial: Avian Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	8-11 Day(s), (14 Day(s))	<i>Gallus gallus</i> (Chicken), Egg, 3 Day(s) (Measured in: Embryo), Not Reported, Laboratory (FROM HATCHERY, SIIPIKARJAN-HOITAJAIN LIITTO R.Y., HAMEEN-LINNA, FINLAND)	No substrate, Injection, Air sac injection, NA Embryo	Unmeasured	0 umol/org / 5 umol/org / 25 umol/org / 50 umol/org / 100 umol/org	Mortality (Mortality-Mortality, Response Site: Not reported)	LD50 (>50-<100 umol/org)	Mortality	Uninformative	94468
79-00-5	8-11 Day(s), (14 Day(s))	<i>Gallus gallus</i> (Chicken), Egg, 6 Day(s) (Measured in: Embryo), Not Reported, Laboratory (FROM HATCHERY, SIIPIKARJAN-HOITAJAIN LIITTO R.Y., HAMEEN-LINNA, FINLAND)	No substrate, Injection, Air sac injection, NA Embryo	Unmeasured	0 umol/org / 5 umol/org / 25 umol/org / 50 umol/org / 100 umol/org	Growth (Morphology-Abnormal, Response Site: Eye,Skeleton,Viscera,Whole organism)	NR (5-100 umol/org)	Reproductive/Teratogenic	Low	94468
79-00-5	8-11 Day(s), (14 Day(s))	<i>Gallus gallus</i> (Chicken), Egg, 6 Day(s) (Measured in: Embryo), Not Reported, Laboratory (FROM HATCHERY, SIIPIKARJAN-HOITAJAIN LIITTO R.Y., HAMEEN-LINNA, FINLAND)	No substrate, Injection, Air sac injection, NA Embryo	Unmeasured	0 umol/org / 5 umol/org / 25 umol/org / 50 umol/org / 100 umol/org	Growth (Growth-Length,Weight, Response Site: Whole organism)	NR (5-100 umol/org)	Development/Growth	Uninformative	94468

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Terrestrial: Avian Extraction Table										
CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	8-11 Day(s), (14 Day(s))	<i>Gallus gallus</i> (Chicken), Egg, 6 Day(s) (Measured in: Embryo), Not Reported, Laboratory (FROM HATCHERY, SIIPIKARJAN-HOITAJAIN LIITTO R.Y., HAMEEN-LINNA, FINLAND)	No substrate, Injection, Air sac injection, NA Embryo	Unmeasured	0 umol/org / 5 umol/org / 25 umol/org / 50 umol/org / 100 umol/org	Mortality (Mortality-Mortality, Response Site: Not reported)	LD50 (>50-<100 umol/org)	Mortality	Uninformative	94468
79-00-5	8-11 Day(s), (14 Day(s))	<i>Gallus gallus</i> (Chicken), Egg, 3 Day(s) (Measured in: Embryo), Not Reported, Laboratory (FROM HATCHERY, SIIPIKARJAN-HOITAJAIN LIITTO R.Y., HAMEEN-LINNA, FINLAND)	No substrate, Injection, Air sac injection, NA Embryo	Unmeasured	0 umol/org / 5 umol/org / 25 umol/org / 50 umol/org / 100 umol/org	Growth (Morphology-Abnormal, Response Site: Eye,Skeleton,Viscera,Whole organism)	NR (5-100 umol/org)	Reproductive/Teratogenic	Low	94468
79-00-5	8-11 Day(s), (14 Day(s))	<i>Gallus gallus</i> (Chicken), Egg, 3 Day(s) (Measured in: Embryo), Not Reported, Laboratory (FROM HATCHERY, SIIPIKARJAN-HOITAJAIN LIITTO R.Y., HAMEEN-LINNA, FINLAND)	No substrate, Injection, Air sac injection, NA Embryo	Unmeasured	0 umol/org / 5 umol/org / 25 umol/org / 50 umol/org / 100 umol/org	Growth (Growth-Length,Weight, Response Site: Whole organism)	NR (5-100 umol/org)	Development/Growth	Uninformative	94468

* If multiple extractions contained all identical information except the effect level, extraction rows were collapsed and the differing levels are listed by comma in this row.

Terrestrial: Worms Extraction Table

CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Source	Exposure Media, Route Grouping, Type, Sample Number	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Health Effect as reported by the Study Author(s)	Effect Level as reported by the Study Author(s)*	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	48 Hour(s), (48 Hour(s))	<i>Eisenia fetida</i> (Earthworm), Adult, Not Reported, Laboratory (GROWN IN THE AUTHOR'S LABORATORY)	Filter paper, Environmental, unspecified, Not Reported	Unmeasured	NR / NR / NR / NR / NR / NR	Mortality (Mortality-Mortality, Response Site: Not reported)	LC50 (42 (35-49) ug/cm2)	Mortality	High	3625226

* If multiple extractions contained all identical information except the effect level, extraction rows were collapsed and the differing levels are listed by comma in this row.

Data Extraction of Rodent Data for the Application of Environmental Hazard										
CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Strain	Exposure Type	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Hazard Effect/ Hazard Level	Effect Level as reported by the Study Author(s)	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	2-hour, (2-hour)	rat, Sampling Age: adult Exposure Age: adult, male, albino	inhalation	measured (GC MS)	0/4,128/9,648 mg/m3	4,128/9,648 mg/m3	NOAEL/LOAEL	mortality	Medium	29336
79-00-5	17-hour, (24-hour)	mouse, Sampling Age: adult Exposure Age: adult, female, Swiss Webster	inhalation	unmeasured	0, 73,700 mg/m3	73,700 mg/m3	LC50	mortality	Medium	29227
79-00-5	18-hour, (18-hour)	rat, Sampling Age: adult Exposure Age: adult, both, Sprague-Dawley	Diet	unmeasured	1080 mg/kg/day	No Effect	NOAEL/LOAEL	Mortality/Reproduction/Development	High	18954
79-00-5	14-day, (14-day)	mouse, Sampling Age: adult Exposure Age: adult, both, CD-1 strain	Diet	unmeasured	3.8, 38 mg/kg/day	No Effect	NOAEL/LOAEL	Mortality/Reproduction/Development	High	64556
79-00-5	90-day, (90-day)	mouse, Sampling Age: adult Exposure Age: adult, both, CD-1 strain	Diet	unmeasured	384 mg/kg/day	No Effect	NOAEL/LOAEL	Weight	High	64556
79-00-5	5-day, (5-day)	mouse, Sampling Age: adult Exposure Age: adult, both, ICR/SIM	Diet	unmeasured	350 mg/kg/day	No Effect	NOAEL/LOAEL	Mortality/Reproduction/Development	Medium	64557
79-00-5	48-hour, (48-hour)	mouse, Sampling Age: adult Exposure Age: adult, Male, CD-1 strain	Diet	unmeasured	378 mg/kg/day	378 mg/kg/day	LD50	mortality	Medium	64564
79-00-5	48-hour, (48-hour)	mouse, Sampling Age: adult Exposure Age: adult, Female, CD-1 strain	Diet	unmeasured	491 mg/kg/day	491 mg/kg/day	LD50	mortality	Medium	64564
79-00-5	14-day, (14-day)	mouse, Sampling Age: adult Exposure Age: adult, both, CD-1 strain	Diet	unmeasured	3.8, 38 mg/kg/day	No Effect	NOAEL/LOAEL	Mortality/Reproduction/Development	High	64564

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Data Extraction of Rodent Data for the Application of Environmental Hazard										
CASRN	Exposure and Overall Duration	Test Organism Species, Age, Sex, Strain	Exposure Type	Test Analysis Exposure Parameters	Dose/ Concentration for Each Main Group of the Study	Hazard Effect/ Hazard Level	Effect Level as reported by the Study Author(s)	Health Outcome Identified by the Assessor	Overall Quality Determination	HERO ID
79-00-5	4-hour, (4-hour)	rat, Sampling Age: adult Exposure Age: adult, both, Fischer 344	inhalation	measured (GC MS)	0, 58, 181, 1527 ppm (0, 320, 998, 8418 mg/m3)	976/4,631 mg/m3	NOAEL/LOAEL	mortality	High	664458

1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
pre guideline Rat; Albino; Male	Inhalation: Vapor 2 hours none	POD: 4,906 mg/m3 (NOAEL, liver) (890 ppm) 0, 890, 2080 ppm (in air, water, or food)	Concentrations were converted using the formula: (ppm * mw)/24.2 = mg/m3; 890 ppm * 133.41 g/mol /24.2 = 4,906 mg/m3. Adult male albino rats were injected i.p. with either saline for 4 days (control for 890 ppm group) or corn oil for 2 days (control for 2080 ppm group) prior to test substance exposure (served as controls for other experiments). Rats (5/group) were then exposed for 2 hours to 0, 890 or 2080 ppm (0, 4,906 or 11,434 mg/m3) of 1,1,2-trichloroethane via whole body inhalation and sacrificed 24 hours later. Endpoints evaluated included mortality, body weights, liver weights, serum AST (SGOT), ALT (SGPT) and hepatic glucose-6-phosphatase levels. In the 2080 ppm group, one rat died and two others were so moribund blood samples could not be obtained. Body weights were not reported. Relative liver weight, serum AST and hepatic glucose-6-phosphatase levels were not different from control. Serum ALT levels were significantly increased (about a 2-fold) at 2080 ppm compared to control.	Test substance is a respiratory irritant and therefore respiratory rate should be provided. Number of air changes was not provided.	Hepatic/Liver: Medium, Mortality: Medium	Carlson 1973 29336
None reported Rat; Sprague-Dawley - [rat]; Male	intraperitoneal injection once Rats were treated with a single i.p. injection. Conversion of dose: 1.1 mmol/kg = 147 mg/kg (based on MW = 133.40 g/mol)	POD: 147 mg/kg (NOAEL, no effects) (1.1 mmol/kg) 0, 1.1mmol/kg	Sprague-Dawley rats (6 males/group) were administered a single dose of corn oil (10 mL/kg) via gavage. Eighteen hours later, 1.1 mmol/kg of 1,1,2-trichloroethane was administered as a single dose via intraperitoneal injection. A second group of six males remained untreated and served as controls. Endpoints included plasma alanine aminotransferase (ALT) activity and histopathology of liver. No effects on plasma ALT activity or histological changes in the liver were observed in animals exposed to 1,1,2-trichloroethane compared to controls. The NOAEL was 1.1 mmol/kg (147 mg/kg) based on no treatment-related effects at the only dose tested. This study includes additional data that be relevant to characterization of PESS. Pre-treatment with acetone and co-exposure with other haloalkanes can result in hepatotoxic effects at doses that do not elicit effects from individual chemical treatments.	Only one dose was tested and only one sex was tested.	Hepatic/Liver: Medium	Charbonneau et al. 1991 660794

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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
EEC Guideline B.1; OECD Guideline 401 Mouse; Crl: CD1 (ICR) BR; Both	i.p. single dose Only a range of doses was reported (200-400 mg/kg bd wt)	POD: Not suitable for POD determination 200, 400 mg/kg-bw/day	In an acute i.p. toxicity study, Crl: CD-1 (ICR) BR mice (5/sex) were administered a single dose of 1,1,2-trichloroethane at doses of 200-400 mg/kg bd wt. Mice were examined 24- and 48-hours post exposure. Observed clinical signs included piloerection, hypoactivity, hunched posture, and sedation. The experimental LD50 was not reported for this study; rather, an LD50 of 500 mg/kg from the literature was cited. A POD for the current study could not be determined.	This study was a preliminary toxicity study that was used to determine experimental doses for an in vivo mouse bone marrow micronucleus test. Reporting on methods were limited. Doses were reported as a range. It is unclear how many doses were tested. The incidence of any mortalities and clinical signs were not reported. LD50s are for combined males and females, and the LD50 shown appears to be cited to another study.	Mortality: Low, Clinical signs: Uninformative	Crebelli et al. 1999 194679
None Rat; Not specified; Female	Oral: Gavage 1 days Single oral exposure	POD: 0.0158 g/kg (LOAEL, gross pathology) 0.0158, 0.126, 0.126, 0.252g/kg in corn oil	The is a range-finding study conducted by Dow Chemical. There are no methods provided, although some of the details can be found in the summary of the findings. Female rats (2/group) were fed (assumed by gavage) a single dose of 1,1,2-trichloroethane in one of two solutions in corn oil: a 10% solution with doses of 0.126 or 0.252 g/kg, or a 0.316% solution with doses of 0.0158 or 0.126 g/kg. There is no mention of a negative control. Although there are no methods as to which endpoints were evaluated, some of the reported effects include mortality, clinical signs, and gross pathology of the liver, kidney, and lung. One out of two animals died at 0.126 g/kg (10%), although both animals survived at the same dose at 0.316%. Even at the lowest dose, animals experience lung congestion and (slight?) kidney pathology.	The major limitation of this study is the lack of reporting. There are no methods or detailed results, only a summary of the findings. There are abbreviations that are not defined (F. assumed to be female; sl. assumed to be slight), and no discussion on why or how the doses were chosen. Additionally only 2 animals were used for each exposure group, and no negative control was discussed.	Gross pathology: Uninformative	Dow Chemical 1960 10699088
None Not specified; Not specified; Unknown	Inhalation: Gas 7 hours/day 1 days Exposure for 7 hours/day for either a single day (500 ppm) or repeatedly (30 ppm) (number of days not specified)	POD: 500 ppm (LC50) 30, 500 ppm (in air, water, or food)	The is a range-finding study conducted by Dow Chemical. There are no methods provided, although some of the details can be found in the summary of the findings. Very little information was provided on the inhalation portion of the study. "Exposure to 500 ppm for 7 hours resulted in death of approximately one half of the animals. A concentration of 30 ppm was found to be injurious where breathed repeatedly 7 hours/day by laboratory animals." No other information was reported.	The major limitation of this study is the lack of reporting. There are no methods or detailed results, only a summary of the findings. It is unclear what species was tested, the number of animals, the endpoints evaluated, the number of repeated doses, and what "injury" occurred following the repeated exposure.	Mortality: Uninformative	Dow Chemical 1960 10699088

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
No guideline or adherence to GLP was specified Rabbit; Not specified; Unknown	Dermal 24 hours/day 1 days Animals were dermally exposed to the test substance at doses of 0.5 and 1 g/kg, for 24 hours.	POD: 1,000 mg/kg (LC0; no mortality occurred) 0.5, 1g/kg	In a poorly described test, undiluted 1,1,2-trichloroethane, was applied to the skin of rabbits (2/dose, strain, and sex not specified) at doses of 0.5 or 1.0 g/kg, for 24 hours. The conditions of exposure (occlusion, application site, area of coverage, whether sites were washed etc.) and the duration of observation were not reported. Based on the limited information provided in the source, animals were observed for mortality, weight changes, and the sites of application were monitored. No animals died. Animals in the 0.5 g/kg group lost a "very slight" amount of weight. Skin was slightly necrotic and slight hyperemia with moderate edema was observed. In the 1.0 g/kg group, weight loss was described as moderate. The skin was necrotic with hyperemia, and edema was moderate. No additional details were provided. The 1.0 g/kg dose could be considered a 24-hour LC0.	This study was limited by the lack of details, including details about the test material, the test model, exposure conditions, and outcome assessment methodology.	Mortality, Irritation: Uninformative	Dow Chemical 1960 10699088
None Rabbit; Not specified; Unknown	Ocular Single instillation days Details of exposure administration were not provided. It is assumed that the test substance was administered via a single instillation into the eye, but this was not explicitly stated.	POD: Unacceptable - insufficient for POD determination. 100Undiluted - assume 100%	Eye irritation was assessed as part of range-finding toxicological tests conducted by Dow Chemical. There are no methods provided, the undiluted test substance (dose volume not specified) was administered to rabbits (strain, sex, and number not reported) via the ocular route. Eye(s) were left unwashed or were washed with water. Pain and moderate conjunctival irritation was noted. The timing of observations and method of irritation assessment (e.g., Draize) were not specified. No quantitative irritation scores were provided and it is unclear whether the same response was observed in both washed and unwashed eyes. Reversal of the irritation responses was "essentially complete" within one week. Without irritation scores, and the timing of the irritative responses, it cannot be determined whether the test substance meets the standards to be classified as irritating to the eyes.	This study is limited by the lack of methodological details.	Irritation: Uninformative	Dow Chemical 1960 10699088
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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The study pre-dates use of OECD TG or GLP practices. Rabbit; Not specified; Unknown	Dermal 24 hours	POD: ~10,000 mg/kg (LD50, dermal) 2520, 5000, 10000, 20000mg/kg	Undiluted 1,1,2-trichloroethane was applied to the skin of Rabbits (4/group; strain and sex not specified) at doses of 2,520, 5,000, 10,000 and 20,000 mg/kg, under occlusive conditions, for 24 hours. Animals were assessed for mortality and for local effects to the skin. Deaths were observed in 0/4, 0/4, 2/4, and 2/4 animals in the 2,520, 5,000, 10,000 and 20,000 mg/kg groups, respectively. Localized effects included the appearance of burning, developments of scabs, and scarring at the lowest two doses and burns worsening at the highest two doses. Material was reported to "leak out" of the skin in the highest dose group. A dermal rabbit LD50 was reported to be "of the order of" 10,000 mg/kg; a definitive LD50 value was not provided.	The duration of animal observations was not specified. No irritation scores were provided; it is unknown if reversibility of the effects (in animals that survived) were assessed. The study did not include monitoring of body weights or gross and/or microscopic examinations which are included in the current OECD TG 402 for acute dermal toxicity. The doses exceed current recommendations for a limit test.	Irritation: Low, Mortality: Medium	Dow Chemical 1956 725343
non-guideline Mouse; Swiss Webster - [mouse]; Female	Inhalation: Vapor 17 hours exposed up to 1000 hours, monitored for anesthesia and death, a subgroup was evaluated for ALT (SGPT activity).	POD: 3750 ppm (20673 mg/m3) (based on time to 50% ALT activity, anesthesia, and mortality) 0, 3750 ppm (in air, water, or food)	Female Swiss Webster mice (9-25/group) were exposed to 1,1,2 trichloroethane vapor (likely whole body) at 3750 ppm (corresponding to 20673 mg/m3 calculated using MW= 133.41) for up to 1000 hours. Groups of 20 mice were evaluated for clinical signs of anesthesia and mortality, and another group was evaluated for blood levels of ALT (SGPT activity). LT50 (duration of exposure that produced death in 1/2 the rats tested) was calculated 600 min. ET50 for ALT activity (duration of exposure that produced increased ALT levels in one-half of the exposed mice) was calculated to be 17.5 minutes. ET50 for anesthesia (duration of exposure that produced anesthesia in one-half of the exposed mice) was calculated to be 18 minutes. Hepatic damage was produced only after exposure was long enough to produce anesthesia.	single dose only, exposure durations were variable. ALT (SGPT activity) was only measure of hepatic effect, non-guideline study	Neurological/Behavioral: Medium, Hepatic/Liver: Medium, Mortality: Medium	Ghering 1968 29227
Study does not state which if any compliance methods were adhered to. Rat; Sprague-Dawley - [rat]; Male	intraperitoneal Once	POD: 1 mg/kg (LOAEL, hepatic) 0, 0.3ml/kg	See footnotes for full summary ¹	Study does not state which if any compliance methods were adhered to; study does not state how animals were allocated into study groups.	Gastrointestinal, Hepatic/Liver: Medium	Harms et al. 1976 58005
No guidelines specified. Mouse; Swiss Webster - [mouse];	i.p. injection Single dose Doses not reported	POD: 227 mg/kg (ED50, renal) 0mmole/kg	See footnotes for full summary ²	Study does not report the exposure doses used. Only LD50, ED50 and LD10 are reported.	Hepatic/Liver, Mortality: Low	Klassen and Plaa 1965 64549

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
None Dog; Mongrel; Both	Intraperitoneal injection Single Animals received a single intraperitoneal dose. Additional dose levels included 0.45, 0.50, 0.52, and 0.55 mL/kg-bw.	POD: 640 mg/kg-bw (LD50) 0, 0.24, 0.28, 0.35, 0.37, 0.40mL/kg-bw	This form is for 1,1,2-trichloroethane. Dogs were administered a single intraperitoneal dose of 1,1,2-trichloroethane and observed for mortality for 24 hours after dosing. Liver and kidney effects were also assessed at 24-48 hours after a single dose. The LD50 was 640 mg/kg-bw (0.45 mL/kg-bw). Effects on liver (increased SGPT activity at 530-720 mg/kg-bw, histopathological lesions [centrilobular and subcapsular necrosis, vacuolization of centrilobular hepatocytes] at 340-720 mg/kg-bw) and kidney (decreased PSP excretion at 570-740 mg/kg-bw, histopathological lesions [necrosis] at 500-640 mg/kg-bw) were reported, but NOAEL and LOAEL values could not be reliably determined. Author-reported units (mL/kg-bw) were converted to mg/kg-bw as follows: mL/kg*density of 1.43216 g/mL*1000 mg/g.	Only 1-3 animals were used per dose level, restricting statistical analysis. Detailed data were not provided for liver and kidney effects (e.g., no quantitative data for SGPT activity or PSP excretion; incidence of histopathological lesions not reported at each dose). The small group size, along with the lack of detailed quantitative results, precluded the determination of reliable NOAEL and LOAEL values for liver and kidney effects. In addition, there was variability among animals in body weight (range of 7-14 kg) and breed (described as "mongrel"), which may have increased the variability in results.	Mortality: Medium, Hepatic/Liver: Uninformative, Renal/Kidney: Uninformative	Klaassen and Plaa 1967 64550
pre-guideline study Rat; Sprague-Dawley - [rat]; Male	intraperitoneal Once Doses were not reported	POD: LD50: 930 mg/kg 0ml/kg	The density of 1,1,2 trichloroethane is 1.43 g/ml or 1430 mg/ml. LD50 was converted using the following formula: 1430 mg/ml * 0.65 ml/kg =930 mg/kg. In a lethality study, male Sprague-Dawley rats (5-10/group) were administered a single i.p injection of 1,1,2-trichloroethane (4-5 groups were studied, doses were not reported). The number of deaths after 24 hours were recorded and LD50 determined. An LD50 of 0.65 ml/kg was reported.	Doses administered were not reported.	Mortality: Low	Klaassen and Plaa 1969 9913

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)

Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
pre-guideline study Rat; Sprague-Dawley - [rat]; Male	intraperitoneal Once none	POD: 698 mg/kg (NOAEL, hepatic) 0, 698mg/kg	The LD50 was calculated to be=930 mg/kg0.75 x LD50 of 930 mg/kg = 698 mg/kgMale Sprague-Dawley rats (3/timepoint) were administered a single i.p injection of 1,1,2-trichloroethane (0.75 x LD50; calculated by reviewer to be 698 mg/kg). Rats were sacrificed at 0, 1.5, 3, 6, 12, 24 and 36 hours post-injection. Endpoints included levels of liver triglycerides, glucose-6-phosphatase and lipid peroxidation. Liver triglycerides increased with time from ~7mg/gm liver (at 1.5-3 hours) to ~14-15 mg/gm liver (from 6 - 24 hours) and then up to ~23 mg/gm liver (at 36 hours), however this increase was not reported to be significantly different (possibly due to low number of animals studied). Data from the 0 hour timepoint was not included, therefore a NOAEL/LOAEL call was not made for this endpoint since it can not be determined if this response is significantly different from control. Throughout the time course, no significant change in the liver levels of glucose-6 phosphatase or lipid peroxidation were seen compared to levels at 0 hour.	none	Hepatic/Liver: Medium	Klaassen and Plaa 1969 9913
pre-guideline study Rat; Sprague-Dawley - [rat]; Male	intraperitoneal Once none	POD: Uninformative – not suitable for POD determination 0.2, 0.4ml/kg	The density of 1,1,2 trichloroethane is 1.43 g/ml or 1430 mg/ml. Doses estimated from graphically presented data as 0.2 ml/kg and 0.4 ml/kg. Dose conversions were performed with the following formula: 1430 mg/ml x 0.2 ml/kg= 286 mg/kgMale Sprague-Dawley rats (3/group) were administered a single i.p injection of 1,1,2-trichloroethane (0.2 ml/kg or 0.4 ml/kg [estimated from graphically presented data]; calculated by review to be 286 mg/kg or 572 mg/kg, respectively). Rats were sacrificed 24 hours hours post-injection and liver triglycerides were measured. Liver triglycerides increased from ~5mg/gm liver (286 mg/kg) to ~8 mg/gm liver (572 mg/kg). Data estimated from graphically presented data. A negative control group was not included. A NOAEL/LOAEL call was not made since it can not be determined if this response is significantly different from a negative control.	A negative control group was not included.	Hepatic/Liver: Medium	Klaassen and Plaa 1969 9913

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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
Pre-guideline Guinea pig; Not specified; Both	Dermal 12 hours 1.0 mL pure, 1,1,2-trichloroethane, analytical grade single application to skin depots and skin specimens taken after 15 and 30 minutes and 1, 1.5, 2, 3, 4, 5, 6, and 12 hours of exposure. Liver, kidney and brain specimens taken after 2, 6, and 12 of exposure. 1.0 mL x 1.44 g/ml (density)/0.4 kg (guinea pig body weight) = 3600 mg/kg; body weight of guinea pigs were reported to be 400 - 500 g.	POD: 3600 mg/kg (LOAEL, skin, liver) 0, 1.0mL	11 male and female outbred guinea pigs were administered a single application of 1.0 mL pure, 1,1,2-trichloroethane (analytical grade) to skin depots and skin biopsy specimens were taken after 15 and 30 minutes and 1, 1.5, 2, 3, 4, 5, 6, and 12 hours of exposure. Liver, kidney and brain specimens were taken after 2, 6, and 12 of exposure. Dose conversion: 1.0 mL x 1.44 g/ml (density)/0.4 kg (guinea pig body weight) = 3600 mg/kg. Controls consisted of one anesthetized but not treated animal and 2 treated but not anesthetized animals. Evaluation included morphological in the skin, liver, kidney, and brain tissues. Morphological changes in the epidermis were observed after 15 minutes in all animals and progressed in severity over time up to 12 hours. Changes included cellular degeneration, focal degenerative changes with pyknosis of nuclei and edema in the basal cells, focal separation of the epidermis with vesicle formations. After 2 hours, liver hepatocytes in central lobule showed hydropic changes and moderately reduced glycogen content. Reduced glycogen content and hydropic changes in the centrilobular region were observed at 6 hours, with changes less pronounced at 12 hours. No changes were seen in control animals that were exposed, but not given anesthesia, suggesting that anesthesia may interact with 1,1,2-trichloroethane resulting in effects. No morphological changes in the kidney or brain were observed.	This study was rated as unacceptable. The number of animals (assumed to be 1 animal/time-point) is insufficient to characterize effects. Control specimens were noted to have been taken from unexposed skin "in the neighborhood". There does not appear to be controls for unexposed skin under the skin depots with cyanolit glue. It is unclear how many animals had one skin depot up to 4 depots. It is unclear if animals would have received 1 ml or up to 4 ml of the test substance. The biological response of control groups for skin outcomes was not reported. Controls exposed to TCE but not anesthesia had no liver effects. The study authors suggest that anesthesia may interact with 1,1,2-trichloroethane resulting in effects but did not address the potential confounding. It is unclear if this interaction could be applicable to kidney and brain changes.	Neurological/Behavioral, Hepatic/Liver, Renal/Kidney, Skin/Connective Tissue: Uninformative	Kronevi et al. 1977 1740624

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
No guideline or adherence to GLP was specified. Rat; Sprague-Dawley - [rat]; Female	IP 1 days Single ip injection study	POD: 25.3 mg/kg (NOEL, Liver) 0, 12.7, 25.3, 50.6mg/kg	Female Sprague Dawley rats (6/group) were administered a single IP dose of 1,1,2 trichloroethane in peanut oil at doses according to geometric series. Exact dose levels were not reported. LD50 values were calculated based on the number of deaths at 24 hours and 14 days. 24 hour and 14 day LD50 values were calculated to be 405 mg/kg and 265 mg/kg, respectively. Hepatotoxicity was also evaluated. 1,1,2 trichloroethane was IP injected into groups of 6 rats at doses of 1/8, 1/16, and 1/32 of the 24hr LD50. The precise dose levels were not reported, however, the 24hr LD50 for 1,1,2 trichloroethane is 405 mg/kg, so the dose levels in the hepatotoxicity study were calculated to be 12.7, 25.3, and 50.6 mg/kg. Animals were sacrificed 18 hours after test substance administration and serum SDH levels were determined. Control animals were injected with 1 ml of peanut oil. No other measures of hepatotoxicity were evaluated. Mean SDH activity was increased in animals of the highest treatment group. Study authors did not identify a NOAEL or LOAEL, but based on the increase in SDH activity, a NOEL of 25.3 mg/kg is proposed based on a slight increase in SDH activity at the LOEL of 50.6 mg/kg. The adversity of this affect is not clear.	SDH activity was the only marker of hepatotoxicity that was measured. The number of dose groups and dose levels was not reported for the acute lethality study.	Mortality: Low, Hepatic/Liver: Medium	Lundberg et al. 1986 62934
The study pre-dates test guidelines and GLP (conducted in 1949). Rat; Not specified; Unknown	Inhalation: Vapor 4 hours/day single exposure for 4 hours	POD: 2,756.4 mg/m3 (LOAEL, mortality) (500 ppm) 500 ppm (in air, water, or food)	In an acute inhalation toxicity study, rats (6 total; sex and strain not specified) were exposed to 1,1,2-trichloroethane vapor at 500 ppm for 4 hours. Animals were examined for mortality over an unspecified amount of time. Mortality was the only endpoint evaluated. There were 1/6 deaths. The LC50 is >500 ppm (equivalent to approximately 2,756.4 mg/m3, based on a MW of 133.41 g/mol).	Very limited details were provided in this study. The methods for producing the vapor and exposure method of the animals (nose-only vs whole-body) were not specified. The sex and strain of the rats used in this study were not provided. Other typical endpoints evaluated in an acute toxicity test were not evaluated (clinical signs of toxicity, bodyweight, gross pathology, etc.). And, the observation period following the exposure was not defined.	Mortality: Low	Mellon Institute of Industrial Research, 1946 5466893

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
None Rat; Osborne-Mendel - [rat]; Male	Oral: Gavage Single dose Initiation protocol	POD: No evidence of tumor initiation was observed at 70 mg/kg 0, 70 mg/kg-bw/day	Rats that had been subjected to partial hepatectomies were administered one gavage dose of 1,1,2-TCE at 70 mg/kg. After 5 days, animals were given either 7 weeks of phenobarbital-containing diet followed by 1 week of control diet or 8 weeks of control diet. At study termination, livers were examined histopathologically for GGT-positive foci. No increase in foci was observed in animals with or without phenobarbital. No effects were observed on body weight, body weight gain, or absolute or relative liver weights in either group.	The primary purpose of this study was to evaluate the tumor initiation and promotion potential of the chemical. Effects on body and liver weights were not the primary purpose of the study, and only minimal details are provided for these endpoints.	Cancer/Carcinogenesis: High	Milman et al. 1988 200479
Non-guideline study; not GLP compliant. Rat; Sprague-Dawley - [rat]; Male	Oral: Gavage Single dose Animals were administered a single oral gavage.	POD: 1080 mg/kg (LOEL, microsomal changes) 0, 1080 mg/kg-bw/day	In a mechanistic study evaluating the effects of exposure on microsomal responses, Male Sprague-Dawley rats (3/group) were administered a dose of the test substance in mineral oil at 1080 mg/kg, via gavage. Animals were sacrificed 1 or 18 hours after dosing. Control rats were used, but details (untreated vs. vehicle control) were not provided. Systemic endpoints were limited to mortality, body weights, and relative liver weights. Mechanistic endpoints included measurements of microsomal total protein, RNA content, phospholipids, and diene conjugates. Cytochrome P-450 content, NADPH cytochrome reductase, and cytochrome B5 content were also measured along with the relative content of fatty acids from lipid extracts. It was found that TCE treatments resulted in a greater loss of body weight than control.	Limited systemic endpoints were examined in a mechanistic study. Quantitative data were not provided for systemic endpoints. Details of the negative control were not adequately reported.	Mortality: High, Hepatic/Liver: Medium, Nutritional/Metabolic: Medium	Moody et al 1981 18954
no guideline reported Rat; Not specified; Both	Inhalation: Gas 1 hours initial testing was done on animals without exposure as control. During exposure optokinetic testing was performed lasting 35 minutes and optokinetic stimulation was 15 minutes. The animals served as their own controls.	POD: 1900 mg/m3 (LOAEL, neuro) 0, 1900, 5700, 7500, 9400 mg/m^3	Pigmented rats (17F, 7M) were tested prior to test substance exposure and again during exposure to 1900, 5700, 7500, or 9400 mg/m3 trichloroethane (analytical values) for approximately 1h (to reach stable concentrations: 10 min, optokinetic testing: 35 min, stimulation: 15 min). Endpoints evaluated include slow phase eye velocity (nystagmus) and duration, conflicting optokinetic and vestibular stimulation to cancel nystagmus, and quick movements of the eyes. Dose related decreased optokinetic capacity and slow phase eye velocity were observed.	none	Neurological/Behavioral: High	Niklasson et al. 1993 68728

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The study did not report adherence to a guideline; GLP compliance was not specified. Mouse; Princeton strain; Male	Subcutaneous 1 days Animals received single subcutaneous injections of 1.2, 1.5, 2.0, and 2.9 mM/kg and 1.3, 1.8, 2.1, 2.4, or 2.6 mM/kg	POD: 227 mg/kg (LD50) 0, 1.2, 1.5, 2.0, 2.9mM/kg	See footnotes for full summary ³	This study had limitations in data reporting of histopathology results. Additionally, based on the information available, it does not appear histology was performed on an untreated control group.	Mortality: High, Hepatic/Liver: Medium, Renal/Kidney: Uninformative	Plaa et al. 1958 29447
The study pre-dates OECD guidelines. The study cites FREE, H. M., and FREE, A. H. (1961). Micro-urinalysis in small animals. Proc. Intern. Congr. Biochem. 5th, Moscow, 1961 p.520. Macmillan (Pergamon), New York. Mouse; Swiss - [mouse]; Male	intraperitoneal single dose	POD: 144 mg/kg (NOAEL, renal) 0, 0.05, 0.1, 0.2, 0.4ml/kg	The density of 1,1,2 trichloroethane is 1.44 g/ml. POD was based on >50% of mice having protein and/or glucose in the urine. POD was determined using the following formula: density (g/ml) * ml/kg administered = mg/kg: 1440 mg/ml * 0.1 ml/kg = 144 mg/kg. Male Swiss mice (10/group) were administered 0.05, 0.1, 0.2 or 0.4 ml/kg of 1,1,2 trichloroethane (72, 144, 288 or 576 mg/kg, respectively) intraperitoneally once. 24 hours after injection mortality and urinary protein and glucose (via Combistix test strip) were evaluated. No mice died at 0.05, 0.1 or 0.2 ml/kg; 6/10 mice died at 0.4 ml/kg. At 0.2 ml/kg, 6/10 mice had increased urinary protein, 5/10 had increased urinary glucose. Urinary protein was increased in 1/10 mice at 0.05 ml/kg and 4/10 mice at 0.1 ml/kg. Urinary glucose was not increased at 0.05 or 0.1 ml/kg. At 0.4 ml/kg the surviving 4 mice all had protein and glucose in their urine.	Negative controls were not run currently.	Mortality, Renal/Kidney: Uninformative	Plaa and Larson 1965 64411
test system "designed according to the standard method for assessing sensory irritation in mice (ASTM Designation, E981, 1984) Mouse; Swiss Webster - [mouse]; Male	Inhalation: Vapor 1 hours/day 1 days/week 1 days Exposure was 30 minutes on one occasion	POD: 5500 mg/m3 (NOAEL, respiratory rate decrease) 0, 1000 ppm (in air, water, or food)	RD50 study in mice; one exposure level.	One exposure level (limit test); only respiratory rate was evaluated; n/group not reported	Irritation: Uninformative	Stadler and Kennedy 1996 83190

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
Not specified Rat; Sprague-Dawley - [rat]; Male	Oral: Gavage 1 days Blood specimens taken at 6, 24, and 48 hr after dosing	POD: ED50= 0.45 mmol/kg (for increased serum ALT and AST) 0, 0.35, 0.7, 1.5mmol/kg	Male Sprague-Dawley rats were administered ~0.35, ~0.7 or ~1.5 mmol/kg of 1,1,2-trichloroethane in corn oil via gavage once (animals were fasted 16-24 hours prior to dosing). A control group received an equivalent volume of corn oil (number of animals not reported). Blood samples were taken via retroorbital venus plexis 6 (n=3), 24 (n=5) or 48 (n=5) hours after dosing. It is not clear if the same animal was used for different time points. Serum AST and ALT were measured and an ED50 was determined. ED50 was defined as the effective dose that produces an increase in serum transaminases above the normal range in 50% of the test animals. Mean ALT and AST levels in control animals at 6, 24, and 48 hours were 45+/- 10 and 83 +/- 21 mU/ml, respectively. In the treated animals, serum ALT and AST levels reached maximal levels at 48 hours. The ED50 for the test substance was calculated as 0.45 mmol/kg.	Purity of chemical not reported. The number of animals dosed, and number of control animals were not reported. Data for some time points were omitted from figures (explanation was not provided).	Hepatic/Liver: Medium	Tyson et al. 1983 64561
none reported Guinea pig; Not specified; Both	i.p. injection 1 days/week 1 days Single exposure.	POD: 970 mg/kg-day (mortality) 0, 0.25, 0.5, 2.0mL	Animals were administered a single i.p. dose of 1,1,2-trichloroethane and observed for mortality for up to 48 hours after dosing. All animals in all groups died within 6 hours of dosing. The study-wide POD shown is based on the volume administered (0.25 mL), the density of 1,1,2-trichloroethane (1.44 g/cm ³), and the starting body weights for the 0.25 mL group (0.371 kg).	Data for individual sexes were not reported. Information about the test animals, husbandry conditions, etc. were not reported. The source of the chemical and animal strain was not provided.	Mortality: Medium	Wahlberg 1976 74541

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
Adherence to a test guideline or GLP were not specified. Mouse; CD-1 - [mouse]; Both	Oral: Gavage 1 days single dose administered; seven doses from 200-600 mg/kg bw - all doses used were not specified	POD: 378 mg/kg bw (LD50, mortality in males) 200, 600 mg/kg-bw/day	In an acute toxicity test, CD-1 mice (56/sex; number per dose group not specified) were administered a single dose of a 9:1 v/v solution of 1,1,2-trichloroethane in emulphor and deionized water at one of seven doses ranging from 200 to 600 mg/kg bw. Animals were observed for 14 days following test substance administration and were examined for mortality, clinical signs of toxicity, and necropsies were performed. The number of deaths in each dose group was not reported, but most deaths occurred within 24 hours and no deaths occurred after 48 hours. Sedation within an hour and loss of righting reflex in 10% of animals were observed at and above 450 mg/kg bw. Most animals recovered within 4 hours and did not appear to be in acute distress (not further described). Dose-dependent upper gastrointestinal tract irritation was observed, with irritation observed in all animals at and above 500 mg/kg bw/day. Pale livers were observed in 50-75% of animals in each dose group, and reddened or hemorrhagic lungs were observed in up to 25% of animals. The number of animals showing these effects in each dose group were not specified. The LD50 for males was 378 mg/kg bw (95% CI: 344-408 mg/kg bw) and for females was 491 mg/kg bw (95% CI: 452-550 mg/kg bw).	Bodyweight was not assessed. Results were vague. All dose groups that were used were not specified and the number of animals per dose group were not provided. Methods were cited to White et al. 1985 - this text was not available in HERO and only the abstract was available online. Update: QCer found full text in HERO (id 064563) with same title but different authors-this paper focused on the immunotoxicity of chemicals in random-bred mice.	Mortality: Low	White et al. 1985 64564
Study was conducted according to OECD TG 424, OPPTS 799.9620, and was GLP compliant Rat; Crl:CD (SD)IGS BR; Both	Oral: Gavage Single dose days	POD: 95 mg/kg (NOAEL, systemic and neurotoxicity); 55 mg/kg (NOEL, systemic and neurotoxicity) 0, 55, 95, 200mg/kg	See footnotes for full summary ⁴	No major limitations were identified.	Neurological/Behavioral: High	WIL Research 2004 6547036

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The protocol was designed and the study was conducted in compliance with the following guideline: U.S. Environmental Protection Agency Toxic Substances Control Act (EPA-TSCA) guideline 799.9135 and EPA TSCA GLP Regulations 40 CFR Part 792 Rat; Fischer 344 - [rat]; Both	Inhalation: Vapor 4 hours/day 1 days Target concentrations = 0, 50, 200, 1500 ppm; Actual measured mean concentrations = 0, 58, 181, 1527 ppm	POD: 320 mg/m3 (LOEL, Respiratory) (58 ppm) 0, 58, 181, 1527 ppm (in air, water, or food)	See footnotes for full summary ⁵	Study states decreased respiration was seen in some groups, however, respiratory rates with measures of variability were not reported. Food/water intake was not reported.	Neurological/Behavioral, Hepatic/Liver, Mortality, Nutritional/Metabolic, Renal/Kidney, Lung/Respiratory: High	WIL Research Laboratories 2001 664458

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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The protocol was designed and the study was conducted in compliance with the following guideline: U.S. Environmental Protection Agency Toxic Substances Control Act (EPA-TSCA) guideline 799.9135 and EPA TSCA GLP Regulations 40 CFR Part 792 Rat; Fischer 344 - [rat]; Male	Inhalation: Vapor 4 hours/day 1 days Mean measured concentrations are reported above.	POD: 1130 mg/m3 (NOAEL, body weight, neuro, respiratory) (205 ppm) 0, 60, 205, 1474 ppm (in air, water, or food)	Concentrations were converted using the following formula: (ppm*mw)/24.2 = mg/m3; (205 ppm * 133.41 g/mol)/24.2 = 1130 mg/m3 Male F344 rats (5/group) were exposed for 4 hours to 0, 60, 205 or 1474 ppm (0, 330, 1130 or 8159 mg/m3, respectively) 1,1,2-trichloroethane via whole body inhalation. Rats were sacrificed 24 hours after exposure. Endpoints evaluated included mortality, clinical signs of toxicity, body weights and evaluation of bronchoalveolar lavage fluid (BALF). Gross and microscopic examinations were not conducted as part of this experiment. No deaths were reported. Exposure to the 1474 ppm led to neurological impairment (no reaction to a novel stimulus [sudden noise] around the midpoint of exposure; and immediately after exposure and the next day rats were sleepy and lethargic, had decreased respiration rates, hypothermia and clear discharge of the eyes). Terminal body weights were significantly decreased (12%) at 1474 ppm compared to control. Total protein in the bronchoalveolar lavage fluid was significantly increased (167%) at 1474 ppm compared to control. No changes in BALF total or differential cell counts related to exposure were seen. Phagocytic activity of alveolar macrophages was decreased at all concentration compared to control, however no exposure-related relationship was observed (the magnitude of the effect was similar across all dose groups). Respiratory burst activity of alveolar macrophages was similar between the groups. Study authors did not identify a NOAEL or LOAEL based on the results of this study. A NOAEL of 205 ppm is proposed based on decreased body weight, clinical signs, neurological impairment, and changes in BALF.	Study states decreased respiration was seen in some groups, however, respiratory rates with measures of variability were not reported. Food/water intake was not reported.	Neurological/Behavioral, Mortality, Nutritional/Metabolic, Lung/Respiratory: High	WIL Research Laboratories 2001 664458

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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The protocol was designed and the study was conducted in compliance with the following guideline: U.S. Environmental Protection Agency Toxic Substances Control Act (EPA-TSCA) guideline 799.9135 and EPA TSCA GLP Regulations 40 CFR Part 792 Rat; Fischer 344 - [rat]; Female	Inhalation: Vapor 4 hours/day 1 days Mean measured concentrations are reported above.	POD: 976 mg/m3 (NOAEL, body wt, neuro, respiratory) (177 ppm) 0, 45, 177, 840 ppm (in air, water, or food)	Concentrations were converted using the following formula: (ppm*mw)/24.2 = mg/m3; (177 ppm * 133.41 g/mol)/24.2 = 976 mg/m3 Female F344 rats (5/group) were exposed for 4 hours to 0, 45, 177 or 840 ppm (0, 248, 976 or 4631 mg/m3, respectively) 1,1,2-trichlorethane via whole body inhalation. Rats were sacrificed 24 hours after exposure. Endpoints evaluated included mortality, clinical signs of toxicity, body weights and evaluation of bronchoalveolar lavage fluid (BALF). Gross and microscopic examinations were not conducted as part of this study. 3/5 females died following exposure to 840 ppm. No other deaths were seen. Terminal body weight was significantly decreased (11%) at 840 ppm compared to control. Exposure to the 840 ppm led to neurological impairment (no reaction to a novel stimulus [sudden noise] around the midpoint of exposure; immediately after exposure and the next day rats were sleepy and lethargic, had decreased respiration rates, ataxia, hypothermia, prostration and clear discharge of the eyes). Total protein in the bronchoalveolar lavage fluid was significantly increased (55%) at 840 ppm compared to control. No changes in BALF total or differential cell counts related to exposure were seen. Phagocytic activity of alveolar macrophages was decreased only at 177 ppm with no exposure-related relationship was observed. Respiratory burst activity of alveolar macrophages was similar between the groups. Study authors do not report a NOAEL or LOAEL based on the results of this experiment. A NOAEL of 177 ppm is proposed based on increased mortality, decreased mean body weight, clinical signs, and neurologic impairment at 840 ppm.	Study states decreased respiration was seen in some groups, however, respiratory rates with measures of variability were not reported. Food/water intake was not reported.	Neurological/Behavioral, Mortality, Nutritional/Metabolic, Lung/Respiratory: High	WIL Research Laboratories 2001 664458

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1,1,2-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
Non-guideline study; not GLP compliant. Rat; Wistar - [rat]; Female	Oral: Gavage 1 days Animals were administered a single dose via gavage	POD: 667 mg/kg (LOAEL, liver effects) 0, 5mmol/kg	Wistar rats (females; number per group not specified), were administered a single dose of 1,1,2-trichloroethane in arachidic oil via gavage, at 0 and 5 mmol/kg. Animals were sacrificed 6, 12, 24, 36, 48, and 72 hours after dosing. Blood was collected for serum measurements of SDH, GPT, and GDH, and livers were fixed for microscopic examinations. Serum measurements showed rises in serum SDH and GDH that peaked and became significant at 24hrs, after-which levels slowly declined. Levels of GPT increased over time and were significantly higher than in controls 3 hours post-dosing. Microscopic examinations at 12 hours showed cloudy and swelling hepatocytes from treated animals with vacuolar degeneration and scattered necrosis. At 24-36 hours, immune cell infiltrates, and proliferation of Kupffer cells near the areas of necrosis were observed. At 72 hours, the liver damage was recovered. In rats treated with the test substance and sacrificed at 24 hours, the total free radical concentration was significantly higher than control. Separate experiments were done using isolated perfused rat livers. The perfusate contained up to 5 mmol/L of 1,1,2-trichloroethane, and isolated rat livers were perfused at a rate of 12 ml/min, for 30 minutes. Collections were made at 0, 0.5, 1.0, 1.5, 2.0, and 3.0h after the addition of the test substance. In perfusate, levels of SDH, GDH, and potassium increased over time, becoming significant at 3 hours. A LOAEL of 5 mmol/kg (or 667 mg/kg) was determined for this review based on evidence of hepatotoxic effects	The number of animals used in the study was not specified.	Hepatic/Liver: Medium	Xia and Yu 1992 659098

* Overall Quality Determination

¹ 58005: Dose conversion: 0.3 ml/kg administered. Rats weighed on average 400 g, density=1.43 g/cm³(1.43 g/ml * 0.3 ml) = 0.429 g or 429 mg. 429 mg/0.4 kg = 1.0 mg/kg Male Sprague-Dawley rats (5-8/group) were given a single i.p. injection of 0 or 0.3 ml/kg (1 mg/kg) of 1,1,2-trichloroethane in corn oil one day before testing. Effects on the bile duct-pancreatic fluid flow was studied in two tests: 1) retrograde injection of [3H]inulin into the biliary tree (followed by a 6 minute occlusion, to hold the inulin and dilute it in the bile duct-pancreatic duct fluid), bile drops from the common bile duct-pancreatic duct (distal) portion of the biliary tree were then collected and analyzed via scintillation counter; and 2) double cannulation of the common bile duct to compare the bile-duct pancreatic fluid flow distally to the hepatic bile flow, proximally (1 hour of collection). In addition [3H]ouabain was injected intravenously at the start of the 1 hour collection, the amount excreted into the bile was determined. Other endpoints evaluated included serum ALT and histopathology on liver, pancreas and common bile duct at the end of the double cannulation experiment. The percentage of [3H]inulin recovered in 12 drops of bile was significantly decreased (approximately 33%) compared to control, possibly due to increased absorption and/or increased dilution. In the double cannulation experiment, no significant difference in the rate of hepatic bile flow was seen, however there was a significant increase in the rate of bile duct-pancreatic fluid flow (approximately 12-fold) compared to control. The percentage of [3H]ouabain recovered in the hepatic bile following intravenous injection was significantly decreased compared to control. At the end of the double-cannulation study, serum ALT levels were increased (25-fold) over control and all treated rats had centrilobular necrosis (histology data not shown). No obvious abnormalities were seen in the pancreas or common bile duct (mild nonspecific interstitial inflammation and congestion were noted- data not shown)

- ² 64549: POD was determined by multiplying the ED50 (25 mmol/kg) by the mw of 1,1,2-trichloroethane (133.41 mg/mmol): $1.7 \text{ mmol/kg} \times 133.41 \text{ mg/mmol} = 227 \text{ mg/kg}$. For the lethality study, 4-5 groups of male Swiss-Webster mice (10/group) were injected with a single dose of 1,1,2-trichloroethane (doses not reported). The number of deaths were recorded at the end of 24 hours (mice were observed for an additional 10 days). To assess liver and kidney function, another group of mice (number of mice/group, the number of groups and doses were not reported) were injected with a single dose of 1,1,2-trichloroethane. 24 hours later, liver function was evaluated by measuring serum levels of ALT (SGPT) and sulfobromophthalein (BSP) concentration (30 minutes after intravenous administration); and kidney function was assessed by measuring phenolsulfonephthalein concentration (2 hours after intravenous administration) and urinary protein and glucose levels. Control (oil-treated) mice were run simultaneously with treated animals. A third set of mice, 4-6 groups (10-15/group) were injected i.p. with 1,1,2-trichloroethane (doses not reported except to state organ dysfunction ED50 and LD50 doses were included-determined by tests in this study). Liver and kidney histopathology were evaluated 24 hours after injection. Authors report a 24-hour LD50 of 3.7 mmol/kg. An ED50 of 1.7 mmole/kg for renal function was determined based on glucose excretion. An ED50 of 1.8 mmole/kg was determined for liver dysfunction (serum ALT levels). Study reports cellular infiltration and vacuolation of hepatocytes were seen at the low dose, and centrilobular coagulative necrosis was observed at the higher doses. Kidney lesions were present in treated mice and included hyaline droplets, nuclear pyknosis, hydropic degeneration, and increased eosinophilia, to necrosis with karyolysis and loss of epithelium of the convoluted tubules (dose changes that occurred were not reported).
- ³ 29447: Groups of Princeton albino mice (5-15 males/group) were administered 1,1,2-trichloroethane in peanut oil as a single s.c. injection of 1.3, 1.8, 2.1, 2.4, or 2.6 mM/kg (sleeping time experiment) or 1.2, 1.5, 2.0, and 2.9 mM/kg (lethality experiment). Prior to exposure, the sleeping time of each group was determined following an i.p. injection of sodium pentobarbital; data from all mice were pooled for the determination of a baseline "normal" duration of anesthesia. This pooled untreated control was comprised of data from 270 mice. A group of positive control animals treated with tannic acid, a known liver-damaging agent were also included. Sleeping time was determined 24 hours post-injection. For the lethality experiment, animals were monitored for mortality for 10 days. Sleeping time ED50 and LD50 values were determined. At doses where sleeping time was significantly prolonged, bromsulphthalein (BSP) retention was also measured 24 hrs after administration of the test substance. At necropsy, livers and kidneys were grossly examined and subjected to histopathological analysis. Necropsy times were not explicitly specified nor whether animals from both or one experiment were examined. Mortalities occurred in 0/10, 8/15, 7/10, and 5/5 animals at 1.2, 1.5, 2.0, and 2.9 mM/kg, respectively. The LD50 was 1.7 (1.5-1.9) mM/kg (equivalent to ~227 mg/kg). Weight loss along with cessation of drinking and eating was reported at the higher doses within 24 hours (unclear if this result is specific to the COI). The mean pentobarbital sleeping time in controls was 1.5 ± 4.1 min. The numbers of animals showing significantly prolonged sleeping times at 24hrs (compared with controls) were 0/5, 2/10, 6/8, 7/9, and 5/5, with mean sleeping times of 0, 12, 103, 51, and 179 minutes at 1.3, 1.6, 2.1, 2.4, or 2.6 mM/kg, respectively. Sleeping times prior to 24 hours and at 72 hours were also assessed. EC50 was 2.1 (1.9-2.4) mM/kg (equivalent to ~280 mg/kg). All sleeping times greater than 10 minutes were considered to be statistically significant. There was no significant change in BSP retention at the highest dose. The kidneys of "most" (incidence not reported) treated animals showed tubular lesions with broad bands of fibrinoid necrosis in the kidney cortex and occurred at doses that did not produce evidence of liver toxicity (1.3mL/kg). Livers showed paling to distinct mosaic lobular mottling at necropsy and/or yellowing and severity increased with dose. Higher (unspecified) dose ranges showed central necrosis of varying degrees of severity with incidences of congestion and fibroid necrosis. Cytoplasmic vacuolation was noted in lower dose groups. There was a correlation between sleeping time and gross and microscopic lesions. Doses in mg/kg were determined for this review using a molecular weight of 133.4 g/mol
- ⁴ 6547036: Groups of Crl:CD (SD)IGS BR rats (12/sex/group) were administered single doses of 1,1,2-trichloroethane, via gavage in corn oil, at doses of 0 (vehicle), 55, 95, and 200 mg/kg. Animals were sacrificed on study day 15. Animals were observed twice daily for mortality and moribundity. Clinical examinations were performed daily. Weekly body weights were recorded. All study animals underwent FOB and locomotor activity testing on day 0, and approximately 45-minutes post-dosing on days 7 and 14. Brain weights and dimensions were recorded. Neuropathological evaluations (including macroscopic and microscopic examinations of central and peripheral nervous system tissues) were performed on 6/sex in the control and high-dose groups. No deaths were observed. Brown material on the anogenital area and/or soft stool was noted in both sexes at 200 mg/kg the day after dosing. The study authors did not consider this to be test-article related. Mean body weight gains during study days 0-7 were significantly decreased in high dose males. At the time of peak effect (~45 min post-dosing) there was a lower incidence of animals with eyes wide-open and greater incidence of animals sleeping, sitting with their heads held low or with a flattened posture in the 200 mg/kg groups; these effects were not seen at later time points. Locomotor activity assessment showed significant incidences of hypoactivity and disruption of habituation at ≥ 95 mg/kg. The study authors did not consider the motor effects to be adverse due to lack of persistence or correlating FOB findings. FOB showed a higher incidence of slight gait impairment and abnormal gait scores in high-dose animals, compared to controls, along with reduced motor activity and decreased urination. Mean body temperatures were significantly lower in both sexes at ≥ 95 mg/kg. The study authors did not consider body temperature changes to be adverse. Together, the effects indicate a treatment-related depression in CNS activity and physiological functional domains. None of the effects persisted to study day 7 or 14. There were no significant neuropathological changes related to exposure. An author reported NOEL was 55 mg/kg and NOAEL was 95 mg/kg based on evidence of systemic and neurotoxicity.
- ⁵ 664458: Concentrations were converted using the following formula: $(\text{ppm} \times \text{mw})/24.2 = \text{mg/m}^3$; $(58 \text{ ppm} \times 133.41 \text{ g/mol})/24.2 = 320 \text{ mg/m}^3$. Male and female F344 rats (5/sex/group) were exposed for 4 hours to 0, 58, 181 or 1527 ppm (0, 320, 998, 8418 mg/m³) 1,1,2-trichloroethane vapor in whole body inhalation chambers. Rats were sacrificed 24 hours after exposure. Endpoints evaluated included mortality, clinical signs of toxicity, body weights, gross necropsy (adrenals, aorta, sternbrae, brain, epididymides, eyes with optic nerve, gastrointestinal tract, heart, kidneys, larynx, liver, lungs, lymph nodes, nasal tissues, pancreas, parathyroid, peripheral nerve [sciatic], pituitary, prostate, salivary glands, seminal vesicles, skeletal muscles, skin, spinal cord, spleen, testes, thymus, thyroids, trachea, urinary bladder), organ weights (adrenals, brain, kidneys, liver, lungs, testes) and histology (liver, kidneys, stomach, respiratory tract, adrenal glands). 3/5 females died in 1527 ppm during the study, no other deaths occurred in either sex. Exposure to 1527 ppm led to neurological impairment in both sexes (no reaction to a novel stimulus [sudden noise] around the midpoint of exposure). Immediately after exposure and the day after exposure, high dose rats were sleepy and lethargic, had decreased respiration rates and clear discharge of the eyes; in addition, females also experienced hypothermia (animal body cool to the touch). Terminal body weights were significantly decreased in both sexes at 1527 ppm (13%) compared to control. A dark red area in the glandular portion of the stomach was observed in one female in the 1527 ppm group that died early. At scheduled necropsy, dark red areas on the liver (two males), glandular and/or non-glandular portion of the stomach (one male), cecum, ileum, jejunum and/or stomach (four males, one female), urinary bladder (one male), and a pale liver (one female) were seen in the 1527 ppm group. No other macroscopic findings were observed. In males, a significant increase in relative (but not absolute) kidney weight (19%) was seen at 1527 ppm and correlated with microscopic findings. Slight increases in relative brain weight (5%) seen at 1527 ppm males were likely due to the decreased body weight. Absolute and relative adrenal gland weights were significantly increased at 1527 ppm in males, however microscopic examination failed to reveal a cause, it was concluded that the increase weight was due to stress and not test substance toxicity. In females, significant decreases in absolute (15%) and relative (7%) lung weights were seen in the 181 ppm group (relevance of this is questionable due to lack of dose-response). Histologically, centrilobular necrosis (minimal to mild) was seen at 181 ppm (4/5 females, but not observed in males of this dose level) progressing to moderate to severe hepatocellular necrosis at 1527 ppm (5/5 males and females). In the nasal cavity, histologic findings were primarily in the olfactory epithelium and to a lesser extent, the transition epithelium. Nasal regions III-VI of the olfactory epithelium were primarily affected. Minimal to severe necrosis was observed in multiple section of all 181 and 1527 ppm group rats of both sexes, with severity tending to increase with exposure level and proximity to the nares. At 58 ppm, all females and 2/5 males had minimal to mild olfactory epithelial necrosis in at least one nasal section. Single cell necrosis was observed on the turbinates and lateral wall of nasal sections of the transitional epithelium of all males and females in the 1527 ppm group. In the larynx, acute inflammation (minimal to mild) was seen at 58 ppm (4/5 males), 181 ppm (2/5 males; 1/5 females) and at 1527 ppm (3/5 males; 5/5 females); 1/5 control females also had mild acute inflammation of the larynx. Ulceration and/or erosion of the glandular stomach was seen at 1527 ppm (3/5 males; 2/5 females). A small number of renal cortical tubules in the 1527 ppm group contained brightly eosinophilic to basophilic coarsely granular material in both sexes (1/5 males, 3/5 females). Unless noted, reported outcomes were seen in 0/5 control mice. All other observations were considered unrelated to exposure. Study authors report that the acute inhalation NOEL is less than 58 ppm based on microscopic findings (Olfactory epithelial necrosis and acute laryngeal inflammation at the LOEL of 58 ppm).

1,1,2-Trichloroethane - Short-term (>1-30 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
Non-guideline, non GLP study Mouse; Swiss - [mouse]; Unknown	i.p. 2 days/week 3 weeks Animals were dosed twice per week for three weeks.	POD: 0.1 mg/kg-day (LOEL, increases in hepatocyte apoptosis and oxidative stress) 0, 0.1, 0.4 mg/kg-bw/day	See footnotes for full summary ¹	There is significant ambiguity regarding the test substance. The test material was reported to be trichloroethane. Although this isomer is PECO relevant, the absence of a CASRN or source precludes the ability to confirm this was the isomer used. Also, there is no information on the sex of the mice used in the study and incidences of histopathological changes were not provided.	Hepatic/Liver: Medium	Al-Griw et al. 2016 3501912
None Rabbit; Not specified; Unknown	Dermal 3 days Undiluted test substance was applied to abraded skin (3 applications) or intact skin (7 applications). The duration of exposure and time between applications was not clearly specified, but the text states "repeated prolonged contact over a period of three days."	POD: Uninformative - not suitable for POD determination 100unspecified - assume % for undiluted	This is a range-finding study conducted by Dow Chemical. There are no methods provided, although some of the details can be found in the summary of the findings. Undiluted 1,1,2-Trichloroethane (dose or volume not reported) was applied to intact and abraded skin of rabbits (number, sex, and strain not specified) for 3 applications (belly, abraded), 7 applications (belly, intact), or 7 applications (ear, intact) were dermally exposed to determine irritation. The conditions of the test (occlusion), duration of each exposure, and frequency of the applications were not specified; however the text stated there was "repeated prolonged contact over a period of three days" . A note states that an animal was found dead after 7 applications, but it is not clear which group the animal belonged to. In the intact skin samples, very slight to slight hyperemia, necrosis, and exfoliation was observed. In the abraded skin, slight hyperemia and edema, and moderate necrosis was observed.	The major limitation of this study is the lack of reporting. There are minimal methods and no detailed results, only a summary of the findings. There are abbreviations that are not defined (v. assumed to be very; sl. assumed to be slight), and no discussion on why or how the reported doses were chosen (some doses not reported).	Irritation: Uninformative	Dow Chemical 1960 10699088

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1,1,2-Trichloroethane - Short-term (>1-30 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The study pre-dates OECD guidelines. The study cites FREE, H. M., and FREE, A. H. (1961). Micro-urinalysis in small animals. Proc. Intern. Congr. Biochem. 5th, Moscow, 1961 p.520. Macmillan (Pergamon), New York. Mouse; Swiss - [mouse]; Male	intraperitoneal 3 days/week 5 days Given three times, every other day	POD: 288 mg/kg/day (LOAEL, renal) 0, 0.2, 0.4ml/kg	The density of 1,1,2 trichloroethane is 1.44 g/ml. Doses were converted using the following formula: density (g/ml) * ml/kg administered = mg/kg: 1440 mg/ml * 0.2 ml/kg = 288 mg/kg. POD corresponds to a TWA of 173 mg/kg/day. Male Swiss mice (4-5/group) were administered 0.2 or 0.4 ml/kg of 1,1,2 trichloroethane (288 mg/kg or 576 mg/kg, respectively) intraperitoneally every other day for 3 times. 48 hours after last injection, urine was analyzed (via Combistix test strip) and kidney histology was evaluated. Urine analysis was not reported. Swollen proximal tubules were seen in all exposed mice (>50% of the area in 4/5 mice [0.2 ml/kg] and 2/4 mice [0.4 ml/kg]). Necrotic tubules were seen in all mice at 0.4 ml/kg (2/4 had >50% of area). At 0.2 ml/kg, <50% of area had necrotic proximal tubules in 2/5 mice.	Negative controls not run concurrently.	Renal/Kidney: Uninformative	Plaa and Larson 1965 64411
none reported Mouse; CD-1 - [mouse]; Male	Oral: Gavage 14 days none	POD: 38 mg/kg/day (NOAEL, immune response) 0, 3.8, 38 mg/kg-bw/day	Random bred CD-1 male mice (number of mice/group not specified) were exposed for 14 days to 0, 3.8 or 38 mg/kg/day 1,1,2-trichloroethane in 10% emulphor via gavage. Endpoints evaluated included body weight, spleen weight, humoral immune (quantitation of spleen IgM antibody forming cells [AFC] directed against sheep red blood cells [sRBC]) and cell-mediated immune response (delayed-type hypersensitivity response to sRBC). Terminal body weights were significantly decreased at 38 mg/kg/day compared to control, but the decrease was <10%. Relative spleen weights were not different from control. No changes in humoral or cell-mediated immune responses were seen compared to control.	none	Im-mune/Hematological: High	Sanders et al. 1985 64556

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1,1,2-Trichloroethane - Short-term (>1-30 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/ Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
No guidelines reported. Guinea pig; Not specified; Unknown	Dermal 10 days	POD: 238 mg/kg/day (LOAEL, skin) 0, 100percentage	The density of 1,1,2-trichloroethane is 1.43 g/cm ³ . Dose conversions: 1.43g/ml * 0.1ml= 0.143 g or 143 mg. The weights of the guinea pigs were not reported. For the purpose of this review, we used a weight of 600 grams. The authors state that this is a weight where increasing skin thickness seen in control animals levels off. Assuming guinea pigs weighed about 600 grams, the dose studied was calculated the following way: 143 mg/0.6 kg= 238 mg/kg. Guinea pigs (sex not specified, n=6) had 0.1 ml of neat 1,1,2-trichloroethane (238 mg/kg/day) gently rubbed into the skin with a cotton-tipped applicator once a day for 10 day (sites were left open). An unexposed control site on the same animal was used for comparison. A separate control group (n=22) was also studied. Each day before application, visual scoring of test site was made for presence of erythema, edema, fissuring and scaling, followed by skin-fold measurements. Skin-fold measurements were made 5 days after treatment ended. An increase in skin-fold thickness was seen one day after treatment (+13%) and continued to increase each day, reaching a maximum of +70% after 10 days compared to day 0. In the separate control group, skin-fold thickness was increased +2% at day 10 compared to day 0. Five days after treatment ended skin thickness decreased to (+16%) over day 0 measurements (Actual measurements not provided). Erythema and edema were seen after 1 day of treatment and continued to increase in severity after repeated treatments leading to fissuring and scaling.	No major limitations. Weights of guinea pigs not reported.	Irritation: Uninformative	Wahlberg 1984 5469150

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1,1,2-Trichloroethane - Short-term (>1-30 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
No guidance reported. Rabbit; Not specified; Unknown	Dermal 10 days	POD: 48 mg/kg/day (LOAEL, skin) 0, 100percentage	The density of 1,1,2-trichloroethane is 1.43 g/cm ³ . Dose conversions: 1.43g/ml * 0.1ml= 0.143 g or 143 mg. The weights of the rabbits were not reported. Using EPA subchronic reference value (1988) of 2.98 kg, dose was calculated as follows: 143 mg/2.98 kg= 48 mg/kg. Rabbits (sex not specified, n=4) had 0.1 ml of neat 1,1,2-trichloroethane (48 mg/kg/day) gently rubbed into the skin with a cotton-tipped applicator once a day for 10 day (sites were left open). An unexposed control site on the same animal was used for comparison. A separate control group (n=12) was also studied. Each day before application, visual scoring of test site was made for presence of erythema, edema, fissuring and scaling, followed by skin-fold measurements. Skin-fold measurements were made 5 days after treatment ended. An increase in skin-fold thickness was seen one day after treatment (+47%) and continued to increase each day, reaching a maximum of +118% after 10 days compared to day 0. In the separate control group, skin-fold thickness was not different on day 10 compared to day 0. Five days after treatment ended skin thickness decreased to +57% over day 0 measurements (Actual measurements not provided). Erythema and edema were seen after 1 day of treatment and continued to increase in severity after repeated treatments leading to fissuring and scaling.	No major limitations. The weights of the rabbits were not reported.	Irritation: Uninformative	Wahlberg 1984 5469150
none reported Guinea pig; Not specified; Both	Dermal 1 days/week 7 days Animals were administered the test substance dermally as a single application; the depot was not removed until 5-7 days later (it was noted the test substance was fully absorbed by that time).	POD: 970 mg/kg-day (LOAEL, mortality and decreased body weight) 0, 0.25, 0.5, 2.0mL	Animals were administered the test substance dermally (single exposure for up to 7 days). All animals in the mid- and high-dose groups died, 5 animals in the low-dose group died. Body weights in the low dose group were significantly decreased relative to the control group during all weeks of observation (1-4 weeks after exposure). The dose shown as the study-wide POD was calculated based on the dose of 0.25 mL, a density of 1,1,2-trichloroethane of 1.44 g/cm ³ , and a starting body weight for the 0.25 mL group of 0.371 kg.	Data for individual sexes were not reported. Body weight data were not shown (only statistical significance). Information about the test animals, husbandry conditions, etc. were not reported. The source of the chemical and animal strain was not provided.	Mortality, Nutritional/Metabolic: Medium	Wahlberg 1976 74541

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1,1,2-Trichloroethane - Short-term (>1-30 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
Adherence to test guidelines or GLP were not specified. Mouse; CD-1 - [mouse]; Male	Oral: Gavage 14 days	POD: 3.8 mg/kg bw (NOAEL, organ weight changes (brain, thymus, testes)) 0, 3.8, 38 mg/kg-bw/day	In a 14-day study, male CD-1 mice (12/dose reported under Table 2 but the total number dosed was not specified) were administered a 9:1 v/v solution of 1,1,2-trichloroethane in emulphor and deionized water at doses of 0, 3.8, and 38 mg/kg bw/day for 14 days. Animals were examined for mortality, bodyweight, hematology, serum chemistry, and organ weight (liver, spleen, lungs, thymus, kidneys, and testes). No test substance-related mortality was observed (not further described). There were no significant changes in bodyweight, hematology parameters, or BUN among test animals when compared with controls. Lactic dehydrogenase activity was significantly decreased in high-dose males (21%), but there were no significant changes in SGPT. Relative liver weight was significantly increased (10%) at 3.8 mg/kg bw/day, but absolute liver weights were not significantly different from controls and no significant differences were observed in high-dose animals. Significantly increased brain (11%), thymus (25%), and testes (18%) weights were observed at 38 mg/kg bw/day. The NOAEL is suggested as 3.8 mg/kg bw/day and the LOAEL as 38 mg/kg bw/day, based on absolute organ weight changes in the brain, thymus, and testes.	Histological examination was not conducted. Tabulated results were not provided for mortality or bodyweight. The number of animals per dose group were not provided, but the number of animals evaluated for hematology and serum chemistry parameters was reported under Table 2 (12/group). Methods were cited to White et al. 1985 - this text was not available in HERO and only the abstract was available online. Note by QCer: There is a related reference HERO ID r064563 by White et al 1985, Immunotoxicological Investigations in the Mouse: General Approach and Methods.	Im-mune/Hematological: Medium	White et al. 1985 64564

* Overall Quality Determination

¹ 3501912: Groups of Swiss albino mice (6 to 8/group, sex not specified; aged 3-5 weeks) were administered trichloroethane 0 (sham), 0 (corn oil vehicle), 0.1 or 0.4 mg/kg-BW twice weekly for three weeks, via i.p injection. Animals were observed for mortality and clinical signs of toxicity. Body weights were recorded at the start of the study, weekly thereafter, and at sacrifice. Livers were weighed and microscopically examined. Mechanistic endpoints included assessment of apoptosis in the liver, DNA content and integrity, and lipid peroxidation/MDA content. No mortality or body weight changes related to treatment were observed. Liver weights were significantly increased at 0.4 mg/kg; no liver weight changes were observed at 0.1 mg/kg. Incidences of histopathological changes and statistical significance of increases were not provided. Representative images showed mild vascular congestion and dilation and perivascular cloudy swelling and hydropic degeneration, mild biliary proliferation and periportal aggregation of lymphocytes at 0.1 mg/kg. At 0.4 mg/kg, there was vascular congestion and cellular degeneration with cloudy swelling of hepatocytes and proliferation of bile ductules. Evidence of regenerative hepatocytes with hyperchromatic nuclei was also observed. Animals treated with TCE at both doses showed significant increases in DNA fragmentation, reductions in DNA concentration, and increases in the number of apoptotic hepatocytes, compared with controls. MDA levels in liver homogenates were significantly higher at both 0.1 and 0.4 mg/kg, compared to controls indicating induction of lipid peroxidation/oxidative stress. Mechanistic effects did not show clear dose-response relationships. The study authors reported a NOAEL of 0.1 mg/kg, presumably based on the increases in liver weights in mice. Toxicity values for mechanistic endpoints were not provided. A LOEL of 0.1 mg/kg was determined, based on evidence of apoptosis and lipid peroxidation/oxidative stress. The study authors noted that the exposure window was selected because it is a critical developmental window; however, no developmental endpoints were evaluated.

1,1,2-Trichloroethane - Subchronic (>30-91 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The study was conducted according to USEPA, OPPTS 870.6200 (1998) and USEPA TSCA 40 CFR 799.9620 (2002) guidelines. The study was conducted in compliance with GLP, except for material purity and characterization. Rat; F344/DUCRL; Male	Oral: Drinking water 13 weeks Time-weighted average doses in females were reported separately as follows: 0, 17.1, 55.9, and 98.2 mg/kg-day	POD: 86.0 mg/kg-day (NOEL, neurotoxicity) 0, 12.1, 37.6, 86 mg/kg-bw/day	See footnotes for full summary ¹	Palatability in water was a potentially confounding factor in this study. It is unclear if decreased water intake influenced the neurotoxicity endpoints. Mortality and the negative ophthalmological examinations do not appear to have been impacted by decreased water intake. The study noted that the high-dose material intake ranged from 117.3 - 69.8 in males and from 162.5 - 52.9 in females. The reported average may not be reliable.	Neurological/Behavioral: Uninformative	Dow Chemical 2005 6547037
The study was conducted according to USEPA, OPPTS 870.6200 (1998) and USEPA TSCA 40 CFR 799.9620 (2002) guidelines. The study was conducted in compliance with GLP, except for material purity and characterization. Rat; F344/DUCRL; Female	Oral: Drinking water 13 weeks Time-weighted average doses in females were reported separately as follows: 0, 17.1, 55.9, and 98.2 mg/kg-day	POD: 98.2 mg/kg-day (NOEL, neurotoxicity) 0, 17.1, 55.9, 98.2 mg/kg-bw/day	See footnotes for full summary ²	Palatability in water was a potentially confounding factor in this study. It is unclear if decreased water intake influenced the neurotoxicity endpoints. Mortality and the negative ophthalmological examinations do not appear to have been impacted by decreased water intake. The study noted that the high-dose material intake ranged from 117.3 - 69.8 in males and from 162.5 - 52.9 in females. The reported average may not be reliable.	Neurological/Behavioral: Uninformative	Dow Chemical 2005 6547037
None Rat; Osborne-Mendel - [rat]; Male	Oral: Gavage 5 days/week 7 weeks Promotion protocol	POD: Evidence of tumor promotion was observed at 70 mg/kg/day 0, 70 mg/kg-bw/day	Rats that had been subjected to partial hepatectomies were administered a single tumor initiating dose of diethylnitrosamine (or water) via i.p. injection. Six days later, animals began receiving 1,1,2-TCE at 70 mg/kg/day for 5 days/week for 7 weeks. One week later, the experiment was terminated and livers were examined histopathologically for GGT-positive foci. A significant increase in foci was observed in animals that received 1,1,2-TCE with or without diethylnitrosamine. Body weight gains and absolute (but not relative) liver weights were reduced in animals administered 1,1,2-TCE.	The primary purpose of this study was to evaluate the tumor initiation and promotion potential of the chemical. Effects on body and liver weights were not the primary purpose of the study, and only minimal details are provided for these endpoints.	Cancer/Carcinogenesis: High	Milman et al. 1988 200479

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Subchronic (>30-91 days)

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1,1,2-Trichloroethane - Subchronic (>30-91 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
none reported Mouse; CD-1 - [mouse]; Female	Oral: Drinking water 90 days none	POD: 3.9 mg/kg/day (NOAEL, humoral response) 0, 3.9, 44, 384 mg/kg-bw/day	See footnotes for full summary ³	none	Im- mune/Hematological: High	Sanders et al. 1985 64556
none reported Mouse; CD-1 - [mouse]; Male	Oral: Drinking water 90 days none	POD: 4.4 mg/kg/day (NOAEL, humoral response) 0, 4.4, 46, 305 mg/kg-bw/day	See footnotes for full summary ⁴	none	Im- mune/Hematological: High	Sanders et al. 1985 64556
Adherence to test guidelines or GLP were not specified. Mouse; CD-1 - [mouse]; Both	Oral: Drinking water 90 days Actual doses received were 4.4, 46, and 305 mg/kg bw/day for males and 3.9, 44, and 384 mg/kg bw/day for females.	POD: 46 mg/kg bw/day (NOAEL, bodyweight and water consumption in males) (38 mg/kg bw/day) 0, 3.8, 38, 380 mg/kg-bw/day	See footnotes for full summary ⁵	Several endpoints typically examined in a 90-day repeat dose toxicity study were not evaluated (mortality, clinical signs of toxicity, food consumption, gross pathology, histopathology, etc.). This study was confounded by the significant decrease in water consumption of males (>20%), which could have led to dehydration or mal-nourishment. The number of animals per dose group were not provided, but the number of animals evaluated for growth was reported under Figures 1 and 2 (32/sex/dose in the test group and 48/sex in the control group). Methods were cited to White et al. 1985 - this text was not available in HERO and only the abstract was available online. Note by QCer: There is a related reference HERO ID r064563 by White et al 1985, Immunotoxicological Investigations in the Mouse: General Approach and- Methods.	Nutri- tional/Metabolic: High	White et al. 1985 64564

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1,1,2-Trichloroethane - Subchronic (>30-91 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
This study included a compliance statement that the study was conducted with EPA TSCA GLP 40 CFR Part 792 and EPA TSCA Guideline 799.9346. Rat; Fischer 344 - [rat]; Both	Inhalation: Vapor 6 hours/day 5 days/week 13 weeks	POD: 40 ppm (LOAEC, liver, respiratory) 0, 15, 40, 100 ppm (in air, water, or food)	See footnotes for full summary ⁶	This is a well-designed and well-reported standard subchronic inhalation toxicity study. The authors did report a mix-up where the control and 15 ppm groups were accidentally switched for one 6-hour day of exposure. This was not expected to have a significant impact on the overall interpretation of the study results. The authors did not measure respiratory rates for a known respiratory irritant. Reflex bradypnea could reduce test substance exposure.	Hepatic/Liver, Lung/Respiratory: High	WIL Research Laboratories 2002, HAP Task Force for Dow Chemical 6324088

* Overall Quality Determination

¹ 6547037: Groups of F344/DUCRL rats (10/sex/dose) were exposed to 1,1,2-trichloroethane via drinking water at concentrations of 0, 170, 570, and 1,350 mg/L for 13 weeks. Reported time-weighted average doses were 0, 12.1, 37.7, or 86 mg/kg-day for males and 0, 17.1, 55.9, and 98.2 mg/kg-day for females, respectively. Animals were observed daily for mortality, morbidity and cage-side observations. FOB determinations were evaluated pre-exposure and during weeks 4, 8, and 13; this included grip performance, rectal temperature, landing food splay, and an automated test of motor activity. Detailed clinical observations and measurements of body weight and food and water consumption was performed weekly. Ophthalmologic examinations were conducted pre-and post-exposure. At sacrifice, neuropathological examinations were done on 5/sex/dose. No mortality or daily observational changes occurred. No detailed clinical observational effects or ophthalmoscopic changes were observed. Slight, but significant increases in body weights were observed in males from treatment groups; however, the magnitude of change decreased with dose. Terminal body weights in low-mid-and high-dose males were 6.5, 5.7, and 3.5% higher than controls, respectively. In high-dose females, only body weights were marginally significantly (P = 0.054) increased, compared with controls; 4.2% decrease at termination. It is unclear if this was related to palatability of the test substance in water. Bodyweight changes generally reflected food consumption data, with intermittent significant increases in food consumption in males from all treatment groups (with more significant incidences at the low dose), compared with controls, and a slight reduction in food consumption in high-dose females only. Water intake decreased in a dose-related manner in both sexes and the decrease was statistically significant in both high-dose males (up to 25.3%) and females (up to 26.1%). Except for a slight increase in the urination level of low-dose males, there were no other statistically significant effects on FOB hand-held or open-field observations were observed. No effects on rectal temperatures were observed when comparing any treatment group to controls at any time point, but there were some differences in the low and mid-treatment groups across time. An effect on forelimb grip performance, also looking at treatment vs. time, was only significant when male and female data were combined, and in the low and mid-dose groups only. There were no differences between treated rats and controls. No treatment-related gross or histopathological changes in central or peripheral nervous system tissues were observed. The author reported neurotoxicity NOEL was 86.0 and 98.2 mg/kg-day for male and female rats, respectively, based on the lack of neurotoxic effects

- ² 6547037: Groups of F344/DUCRL rats (10/sex/dose) were exposed to 1,1,2-trichloroethane via drinking water at concentrations of 0, 170, 570, and 1,350 mg/L for 13 weeks. Reported time-weighted average doses were 0, 12.1, 37.7, or 86 mg/kg-day for males and 0, 17.1, 55.9, and 98.2 mg/kg-day for females, respectively. Animals were observed daily for mortality, morbidity and cage-side observations. FOB determinations were evaluated pre-exposure and during weeks 4, 8, and 13; this included grip performance, rectal temperature, landing food splay, and an automated test of motor activity. Detailed clinical observations and measurements of body weight and food and water consumption was performed weekly. Ophthalmologic examinations were conducted pre- and post-exposure. At sacrifice, neuropathological examinations were done on 5/sex/dose. No mortality or daily observational changes occurred. No detailed clinical observational effects or ophthalmoscopic changes were observed. Slight, but significant increases in body weights were observed in males from treatment groups; however, the magnitude of change decreased with dose. Terminal body weights in low-mid-and high-dose males were 6.5, 5.7, and 3.5% higher than controls, respectively. In high-dose females, only body weights were marginally significantly ($P = 0.054$) increased, compared with controls; 4.2% decrease at termination. It is unclear if this was related to palatability of the test substance in water. Bodyweight changes generally reflected food consumption data, with intermittent significant increases in food consumption in males from all treatment groups (with more significant incidences at the low dose), compared with controls, and a slight reduction in food consumption in high-dose females only. Water intake decreased in a dose-related manner in both sexes and the decrease was statistically significant in both high-dose males (up to 25.3%) and females (up to 26.1%). Except for a slight increase in the urination level of low-dose males, there were no other statistically significant effects on FOB hand-held or open-field observations were observed. No effects on rectal temperatures were observed when comparing any treatment group to controls at any time point, but there were some differences in the low and mid-treatment groups across time. An effect on forelimb grip performance, also looking at treatment vs. time, was only significant when male and female data were combined, and in the low and mid-dose groups only. There were no differences between treated rats and controls. No treatment-related gross or histopathological changes in central or peripheral nervous system tissues were observed. The author reported neurotoxicity NOEL was 86.0 and 98.2 mg/kg-day for male and female rats, respectively, based on the lack of neurotoxic effects.
- ³ 64556: Random bred CD-1 female mice (number of mice/group not specified) were provided drinking water that contained 0, 0.02, 0.2 or 2 mg/ml 1,1,2-trichloroethane for 90 days (TWA were reported to be 0, 3.9, 44 or 384 mg/kg/day, respectively). Endpoints evaluated included body weight (only in group of mice used for reticuloendothelial system assay), humoral responses (quantitation of spleen IgM antibody forming cells [AFC] directed against sheep red blood cells [sRBC] on days 4 and 5 after antigen presentation [and spleen weight], hemagglutination titers to sRBC, and spleen cell response to the B cell mitogen lipopolysaccharide [LPS]), cell-mediated immune response (delayed-type hypersensitivity response to sRBC, popliteal lymph node proliferation responses to sRBC and spleen cell response to ConA), peritoneal exudate cells [PEC] were assessed (number recruited, adherence, chemotactic ability and phagocytic ability), functional activity of the reticuloendothelial system (RES)(vascular clearance of sRBC [expressed as phagocytic index], organ uptake of sRBC, [included body weight measurement]), and the ability of the bone marrow to uptake 125-IUdR. Body weights were not significantly different from control. Humoral immune status was depressed. A significant increase in AFC/10⁶ spleen cells was seen at 384 mg/kg/day, although no increase was seen on an AFC/spleen basis. Spleen weights were not different 4 or 5 days after sRBC challenge. Significant decreases in hemagglutination titers were at seen at 44 mg/kg/day (40%) and 384 mg/kg/day (45%) compared to control. Responses of spleen cells to LPS were significantly reduced at 384 mg/kg/day 27% and 30% at optimal and sub-optimal concentration, respectively compared to control. Cell mediated responses were not altered. Functional activity of the fixed macrophages of the RES showed decreased vascular clearance (37%) and an increase in the percent of radiolabel taken up by the spleen (37%) at 44 mg/kg/day; however at 384 mg/kg/day an increase in vascular clearance (33%) was seen and radiolabel uptake was decreased in the spleen (54%) and increased in the liver (17%). No change in the number or function of thioglycolate-recruited PECs were seen. Cell-mediated responses were not altered. No exposure-related differences were seen in the ability of the bone marrow cells to incorporate 125I-IUdR. There is a potential PESS impact based on sex differences in the ability of TCE to alter immune function which can be seen by using certain assays, as noted by the authors.
- ⁴ 64556: Random bred CD-1 male mice (number of mice/group not specified) were provided drinking water that contained 0, 0.02, 0.2 or 2 mg/ml 1,1,2-trichloroethane for 90 days (TWA were reported to be 0, 4.4, 46 or 305 mg/kg/day, respectively). Endpoints evaluated included body weight (only in group of mice used for reticuloendothelial system assay), humoral responses (quantitation of spleen IgM antibody forming cells [AFC] directed against sheep red blood cells [sRBC] on days 4 and 5 after antigen presentation [and spleen weight], hemagglutination titers to sRBC, and spleen cell response to the B cell mitogen lipopolysaccharide [LPS]), cell-mediated immune response (delayed-type hypersensitivity response to sRBC, popliteal lymph node proliferation responses to sRBC and spleen cell response to ConA), peritoneal exudate cells [PEC] were assessed (number recruited, adherence, chemotactic ability and phagocytic ability), functional activity of the reticuloendothelial system (RES)(vascular clearance of sRBC [expressed as phagocytic index], organ uptake of sRBC) and the ability of the bone marrow to uptake 125-IUdR. Body weight was significantly decreased 11 and 12% reduced at 46 and 305 mg/kg/day, respectively. Humoral responses were depressed given that hemagglutination titers were significantly decreased 47% and 59% at 46 and 305 mg/kg/day, respectively. B cell response to LPS was unaltered. Significant increases in AFC were seen at 4.4 and 46 mg/kg/day, but not at 305 mg/kg/day (day 5), spleen weight was also significantly increases at 4.4 mg/kg/day but decreased at 305 mg/kg/day at this timepoint. The significance is questionable given the lack of dose-response. Cell mediated responses were unaltered. The functional activity of the fixed macrophages of the reticuloendothelial system were not altered. Thioglycolate-recruited PEC had significantly decreased phagocytic ability in the 305 mg/kg/day group (~50%) compared to control. No differences were seen in the ability of the bone marrow cells to incorporate 125I-IUdR. There is a potential PESS impact based on sex differences in the ability of TCE to alter immune function which can be seen by using certain assays, as noted by the authors.
- ⁵ 64564: In a 90-day repeat dose toxicity study, CD-1 mice (32/sex/dose in test groups and 48/sex in the control group; the number of mice exposed was not reported, but the number of mice evaluated was reported under the growth charts for each sex) were administered a solution of 1,1,2-trichloroethane in deionized water via drinking water at concentrations of 0, 0.02, 0.2, and 2.0 mg/mL (equivalent to target doses of 0, 3.8, 38, and 380 mg/kg bw/day, respectively) for 90 days. Actual doses received were 0, 4.4, 46, and 305 mg/kg bw/day for males and 0, 3.9, 44, and 384 mg/kg bw/day for females, respectively. Endpoints evaluated included bodyweight gain, water consumption, hematology, serum chemistry, hepatic microsomal activity, and organ weight (brain, liver, spleen, lungs, thymus, kidneys, and testes). Mortality was not reported. A dose-dependent decrease in bodyweight gain was observed in males, and was significantly decreased at 305 mg/kg bw/day. Water consumption was significantly decreased (36%) in males at 305 mg/kg bw/day. Water consumption was slightly decreased in males at 4.4 and 46 mg/kg bw/day (9% and 5%, respectively). There were no dose-related changes in the water consumption of females. A significant increase in the percent of lymphocytes and a decrease in the percent of polymorphonuclear leukocytes were observed in males at 305 mg/kg bw/day. A significant decrease in hematocrit and hemoglobin and a significant increase in leukocytes were observed in females at 384 mg/kg bw/day. Fibrinogen was significantly increased in all dose groups of females. And prothrombin time was significantly decreased in females at and above 44 mg/kg bw/day. In males, calcium levels were significantly increased at and above 46 mg/kg bw/day. Chloride levels were significantly increased in males at 305 mg/kg bw/day. Cholesterol and serum alkaline phosphatase (SAP) were significantly increased in males at 305 mg/kg bw/day and glutathione was significantly decreased at and above 46 mg/kg bw/day. There were no significant changes in hepatic microsomal activity in males. BUN was significantly decreased in males at 4.4 and 305 mg/kg bw/day, and was decreased, but not significantly, at 46 mg/kg bw/day. Cholesterol, SGPT, and glutathione were significantly increased in females at 384 mg/kg bw/day. SGOT and SAP were significantly increased in all test groups of females. Cytochrome P-450 and aniline hydroxylase were significantly decreased in females at and above 44 mg/kg bw/day. Absolute liver (11% and 12%, respectively) and kidney (12% and 16%, respectively) weights were significantly decreased in males at 46 and 305 mg/kg bw/day. Relative weights of these organs were not significantly different from controls. Relative testes weights (11% and 13%, respectively) were significantly increased in males at 46 and 305 mg/kg bw/day. Significantly increased absolute spleen (18%) and kidney (10%) weights were observed in females at 384 mg/kg bw/day; relative spleen and kidney weights were not significantly different from controls. Absolute (32%) and relative (26%) liver weights were significantly increased in females at 384 mg/kg bw/day. Relative brain weights (6%) were significantly decreased in females at 384 mg/kg bw/day. The NOAEL for males is suggested as 46 mg/kg bw/day and the LOAEL as 305 mg/kg bw/day, based on decreased bodyweight and water consumption. The NOAEL for females is suggested as 44 mg/kg bw/day and the LOAEL as 384 mg/kg bw/day, based on increased absolute and relative liver weights. The authors reported a NOAEL for males at 4.4 mg/kg bw/day and a LOAEL at 46 mg/kg bw/day, based in decreased liver glutathione levels. The authors reported a NOAEL for females at 3.9 mg/kg bw/day and a LOAEL at 44 mg/kg bw/day based on decreased cytochrome P-450 and aniline hydroxylase activity. However, these effects are below the organ level.

⁶ 6324088: F-344 rats (10 males and 10 females per group) were exposed by whole body inhalation to 0, 15, 40 or 100 ppm of 1,1,2-trichloroethane for 6 hours/day, 5 days/week for 13 weeks. Animals were monitored daily for clinical observations and mortality with a detailed physical examination (recording body weights and food consumption) each week. Ophthalmic examinations were conducted prior to exposure and near the end of the experiment. Hematology (leukocyte and erythrocyte counts, hemoglobin, hematocrit, mean corpuscular volume, mean corpuscular hemoglobin, mean corpuscular hemoglobin concentration, platelet count, prothrombin time, activated partial thromboplastin time and differential leukocyte count) and serum chemistry (albumin, total protein, globulin, albumin/globulin ratio, total bilirubin, urea nitrogen, creatine, alkaline phosphatase, alanine aminotransferase, aspartate aminotransferase, gamma glutamyltransferase, glucose, total cholesterol, calcium, chloride, phosphorus, potassium, sodium and triglycerides) were performed at the end of the exposure period. Animals were subjected to a gross necropsy, and organ weights for adrenals, brain, epididymides, heart, kidneys, liver, lungs, ovaries, spleen, testes, thymus, thyroids and parathyroids were measured. Histopathology was conducted on tissue samples of adrenals, aorta, bone with marrow from sternum, bone marrow smear (from femur), brain (forebrain, midbrain, hindbrain), epididymides, eyes with optic nerve, exorbital lacrimal glands, esophagus, stomach, duodenum, jejunum, ileum, cecum, colon, rectum, hardierian glands, heart, kidneys, larynx, liver (2 lobe sections), lungs (with bronchi), mediastinal and tracheobronchial lymph nodes, mammary glands (females only), nasal tissues, ovaries with oviducts, pancreas, parathyroids, peripheral nerve (sciatic), pituitary, prostate, salivary glands (mandibular), seminal vesicles, skeletal muscle (rectus femoris), skin, spinal cord (cervical, thoracic, lumbar), spleen, testes, thymus, thyroids, trachea, urinary bladder, uterus with vagina, and all gross lesions. An additional experiment consisting of 36 female F344 rats and B6C3F1 mice per group to determine pharmacokinetics of 1,1,2-trichloroethane was also conducted. No exposure-related deaths occurred over the 13-week study duration, and there were no consistent exposure-related clinical signs of toxicity. Significantly decreased mean body weights were observed in females exposed to 100 ppm, but only during week 0 and week 1. There were no consistent exposure-related effects on food consumption, hematology parameters, ophthalmic findings or organ weights. Significantly increased mean cholesterol was observed at 100 ppm in males and the 40 and 100 ppm groups in females. Significantly decreased glucose was observed in females at 100 ppm. There were no other exposure-related effects on serum chemistry parameters. Hepatocellular vacuolization was observed in 3/10 females at 15 and 40 ppm, and 5/10 males and 10/10 females at 100 ppm. Vacuolization and cysts of the olfactory epithelium were observed in 2/10 males and 4/10 females at 15 ppm. Additional atrophy of the olfactory epithelium was observed in 6/10 males and 7/10 females at 40 ppm and 7/10 males and 10/10 females at 100 ppm, and respiratory epithelium metaplasia was also observed in 3/10 males and 5/10 females at 100 ppm. Additional histopathological changes noted included mononuclear cell infiltrates in various tissues, granulomatous inflammation in the larynx and trachea, and mineralization of the kidney, larynx, nasal turbinates, and cornea of the eye, but these effects were considered to not be exposure related by the authors. The authors state that the NOAEC for liver and nasal histopathology is less than 40 ppm, because they did not consider the effects observed at 15 ppm to be toxicologically significant. The authors called 15 ppm a NOEC. For this review, 40 ppm is considered a LOAEC based on liver and respiratory effects.

1,1,2-Trichloroethane - Chronic (>91 days)

Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
This study pre-dates all guideline and GLP compliance practices Rat; Albino; Both	Inhalation: Vapor 7 hours/day 3.5 days/week 24 weeks 75 days Animals were exposed 7hrs/day on alternate days for 6 months (75 exposures total). An additional group of animals added after exposure day 30 to replace animals that died received 45 exposures.	POD: Uninformative - not suitable for POD determination 0, 84 ppm (in air, water, or food)	A single group of albino rats (12/sex) were exposed, whole body, to a test substance target vapor concentration of 100 ppm (84 analytical) for 7hrs/day on alternate days over a span of 6 months. An air-only control group was included. Due to a significant number of mortalities caused by lung infections, replacement rats of roughly the same age were added to the study (numbers not specified); these rats were exposed for up to 45 days. Endpoints evaluated included mortality, body weight gain, body length, hematology, limited serum chemistry/icterus index, relative liver and kidney weights, liver fat analysis, and gross and microscopic examinations. As stated by the study authors "endemic lung infection of the rat colony minimizes the value of the results produced by this study." In addition, for some endpoints (e.g., liver fat analysis, samples from replacement rats exposed for 45 days and those surviving 75 days were inadvertently pooled, and the data were not considered reliable. NOAEL and LOAEL values for rats were not reported. No conclusions can be made due to poor animal health that severely impacted the study results.	This study is considered to be unacceptable for several reasons; major limitations include: 1). Lung infections were identified in rats from all groups, resulting in a high mortality rate including in the control group (57%). As recognized by the study authors, the resulting data are unusable due to the potential influence of poor health on all outcomes. 2). As animals died, attempts were made to replace them, however, the specifics (number of replacement animals used) were poorly described. Additionally, data from replacement animals (which received a maximum of 45 exposures) were included in the weight curves as if they had started with the original group which further makes results impossible to interpret. However, individual animal data is available at the end of the study.	Lung/Respiratory: Medium, Renal/Kidney: Uninformative	Mellon Institute of Industrial Research 1947 1973131

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1,1,2-Trichloroethane - Chronic (>91 days)

Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/ Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
Study predates guideline and GLP compliance practices Dog; Mongrel; Male	Inhalation: Vapor 7 hours/day 3.5 days/week 24 weeks 75 days Animals were exposed 7 hrs/day on alternate days over a period of 6 months (75 exposures total)	POD: Uninformative - not suitable for POD determination 0, 84 ppm (in air, water, or food)	A single male mongrel dog was exposed, whole body, to a test substance target vapor concentration of 100 ppm (84 ppm analytical), 7 hrs/day on alternate days over a period of 6 months (75 exposures total). An air-only control dog was included. Animal weight gain was monitored. Other endpoints included hematology, serum parameters (serum phosphatase, BUN), liver functional tests (many of which were poorly described) including the thymolbarbital turbidity test, bromosulfalein retention, and gross and microscopic examinations on a limited number of tissues. It is unclear if relative liver and kidney weights were measured for dogs, no data were provided, and these organ weights were not mentioned in the results section of the text. The dog exposed to 1,1, 2-Trichloroethane gained 1.21 kg throughout the study compared to a 3.66 kg gain in the control dog. Some haematological parameters were altered, compared with the previous measurement throughout the study; overall the study authors reported blood counts to be essentially normal. The authors noted that "the single animal exposed to each vapor makes it unwise to base any definite conclusions on their response," and the study was "not recommended for publication." NOAEL and LOAEL values were not determined.	This study had a number of limitations; these include: the use of mongrel (mixed-breed) dogs, use of a single animal/group and a single exposure group, and the lack of details (e.g, methods, animal husbandry). The study authors acknowledge that few conclusions can be made due to the small number of animals used.	Cardiovascular: Medium, Immune/Hematological: Medium, Lung/Respiratory: Medium, Endocrine: Medium, Hepatic/Liver: Uninformative, Mortality: Uninformative, Nutritional/Metabolic: Uninformative	Mellon Institute of Industrial Research 1947 1973131

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1,1,2-Trichloroethane - Chronic (>91 days)

Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
NCI cancer bioassay protocol Rat; Osborne-Mendel - [rat]; Both	Oral: Gavage 5 days/week 78 weeks The study included both untreated controls and vehicle controls. In treated rats, time weighted average doses over the course of the study were 46 and 92 mg/kg/day. Doses were raised from 35 and 70 to 50 and 100 after approximately 20 weeks due to apparent tolerance.	POD: Negative for carcinogenicity 0, 0, 46, 92 mg/kg-bw/day	Osborne-Mendel rats (50/sex/dose) were administered 1,1,2-trichloroethane in corn oil by gavage at time-weighted average dosages of 46 and 92 mg/kg/day, 5 days/week, for a period of 78 weeks, followed by an observation period of up to 35 weeks. Twenty animals of each sex were treated as vehicle controls and gavaged with corn oil at the same dosing volume as the high-dose group of the same sex. Additionally, 20 animals of each sex served as untreated controls and were not intubated. Endpoints included survival, clinical signs, body weights, food consumption, gross necropsy, and histopathology. Organs examined for histopathology included skin, subcutaneous tissue, lungs and bronchi, trachea, bone, bone marrow, spleen, lymph nodes, thymus, heart, salivary gland, liver, pancreas, esophagus, stomach, small intestine, large intestine, kidney, urinary bladder, pituitary, adrenal, thyroid, parathyroid, testis, prostate, nerves, brain, tunica vaginalis, uterus, mammary gland, and ovary. No evidence of carcinogenicity was found. Clinical signs (hunched appearance, rough fur, urine stains on the abdominal area, dyspnea, and squinted eyes, sometimes with reddish exudate) were observed in an increasing number of treated rats as the study progressed. The incidence and frequency of these signs were similar in low- and high-dose groups, except that the high-dose females showed an elevated incidence of abdominal urine staining from week 26 until intubation ceased in week 78.	Authors report that in rats, "the vehicle control groups had unexpectedly poor survival with only 5% of the males and 20% of the females surviving until termination of the study." For rats, the study only presents comparisons with untreated control groups. The study duration was shorter than a standard cancer bioassay in rats. Doses were raised after approximately 20 weeks due to apparent tolerance. Additionally, there is a possibility that the rats in this bioassay did not receive dosages approximating the maximum tolerated dosage because compound administration had no significant effect upon survival or body weight gain in either sex, although clinical signs were observed in an increasing number of treated rats as the study progressed without an apparent dose-response relationship (similar incidences in low- and high-dose groups). There were only two dose groups and dose levels were relatively close. Animals received gavage exposures only 5 days/week for 78 weeks.	Neurological/Behavioral, Cancer/Carcinogenesis, Cardiovascular, Thyroid, Reproductive/Developmental, Gastrointestinal, Immune/Hematological, Hepatic/Liver, Mortality, Musculoskeletal, Nutritional/Metabolic, Ocular/Sensory, Renal/Kidney, Lung/Respiratory, Skin/Connective Tissue, Urinary; Endocrine: Medium	NCI 1978 64554

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1,1,2-Trichloroethane - Chronic (>91 days)

Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
NCI cancer bioassay protocol Mouse; B6C3F1 - [mouse]; Both	Oral: Gavage 5 days/week 78 weeks The study includes both untreated controls and vehicle controls. In treated mice, time weighted average doses over the course of the study were 195 and 390 mg/kg/day. Doses were raised from 150 and 300 to 200 and 400 after approximately 20 weeks due to apparent tolerance.	POD: Positive for carcinogenicity (liver, adrenal gland) 0, 0, 195, 390 mg/kg-bw/day	See footnotes for full summary ¹	There were only two dose groups and dose levels were relatively close. Doses were raised after approximately 20 weeks due to apparent tolerance. Animals received gavage exposures only 5 days/week for 78 weeks.	Neurological/Behavioral, Cancer/Carcinogenesis, Cardiovascular, Thyroid, Reproductive/Developmental, Gastrointestinal, Immune/Hematological, Hepatic/Liver, Mortality, Musculoskeletal, Nutritional/Metabolic, Ocular/Sensory, Renal/Kidney, Lung/Respiratory, Skin/Connective Tissue, Urinary; Endocrine: Medium	NCI 1978 64554
No guideline reported Rat; Sprague-Dawley - [rat]; Both	S.c. injection 1 days/week 104 weeks 104 days Subcutaneous injection of 15.37 or 46.77 umol (not adjusted for body weight) once per week for 2 years	POD: No POD established 0, 15.37, 46.77umol	In a 2-year carcinogenicity study, rats were administered 1,1,2-trichloroethane via an unusual dosing regimen of subcutaneous injections once per week. The doses were 15.37 or 46.77 umol and were not adjusted for body weight. Body weights were not given other than a wide range of starting body weights for males and females combined. End-points assessed included carcinogenicity (including characterization of tumors) and mortality. A POD was not established. Animals (assume males and females combined) treated with 46.77 umol/week showed significantly increased incidence of sarcomas in comparison to untreated controls, but not in comparison to DMSO-treated controls. There appears to a PESS-relevant sex difference in total incidence of sarcomas that were not explained, i.e. regardless of the dose applied, when the sum of male rats with sarcomas (12/100) was compared with the sum of untreated and DMSO-treated controls of the same sex (2/70), the tumor incidence was found to be statistically significant (P < 5%). This was not confirmed with female animals. This reference also contains ADME data.	Dosing was not adjusted for body weight and insufficient information is given to assess the dose in terms of body weight; i.e. mg/kg/day. Females would have received a higher dose per unit body weight than males. All rats would have received lower doses per unit body weight as the study progressed and the animals grew.	Cancer/Carcinogenesis: Uninformative	Norpoth et al. 1988 659081

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1,1,2-Trichloroethane - Chronic (>91 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/ Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID

* Overall Quality Determination

¹ 64554: B6C3F1 mice (50/sex/dose) were administered 1,1,2-trichloroethane in corn oil by gavage at time-weighted average dosages of 195 and 390 mg/kg/day, 5 days/week, for a period of 78 weeks, followed by an observation period of up to 13 weeks. Twenty animals of each sex were treated as vehicle controls and gavaged with corn oil at the same dosing volume as the high-dose group of the same sex. Additionally, 20 animals of each sex served as untreated controls and were not intubated. Endpoints included survival, clinical signs, body weights, food consumption, gross necropsy, and histopathology. Organs examined for histopathology included skin, subcutaneous tissue, lungs and bronchi, trachea, bone, bone marrow, spleen, lymph nodes, thymus, heart, salivary gland, liver, gall bladder and bile duct, pancreas, esophagus, stomach, small intestine, large intestine, kidney, urinary bladder, pituitary, adrenal, thyroid, parathyroid, testis, prostate, nerves, brain, tunica vaginalis, uterus, mammary gland, and ovary. The test substance was carcinogenic in male and female mice based on increased incidences of neoplastic lesions (hepatocellular carcinomas and adrenal pheochromocytomas). Survival was reduced in female mice in the high-dose group. Clinical signs observed at a higher frequency in test substance exposed animals included distended abdomen, which was evident in a few high-dose males and females after 46 weeks and thereafter was observed at gradually increasing numbers in these groups. By week 74 of the study, approximately 70% of the high-dose animals had distended abdomens, which persisted until they died, were sacrificed in extremis, or were sacrificed at termination of the bioassay. Abdominal distension was also seen in two untreated control females, six low-dose females, and one low-dose male. Subsequent necropsy indicated that liver tumors were the cause of abdominal distension in these animals.

1,1,2-Trichloroethane - Reproductive/Developmental						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/ Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
EPA TSCA Test Guideline 40 CFR 799.9380. Conducted under GLP conditions. Rat; CrI:CD(SD)IGS BR; Both	Oral: Drinking water 7 days/week For P1 and F1 males, exposure occurred during pre-mating (≥ 70 days), through mating, and until sacrifice. For P1 and F1 females, exposure occurred during pre-mating, (≥ 70 days), through mating, and during gestation and lactation until weaning of pups at day 21. The start of the 70-day pre-mating exposure of F1 offspring began after weaning at day 21.	POD: 40.6 mg/kg/day (NOAEL, parental systemic nutritional effects, developmental effects) 0, 170, 570, 1350 ppm (in air, water, or food) F0- pre-mating, At least 70 days, males, females, F0- mating, Up to 15 days throughout, males, females, F0 - gestation, throughout gestation, females, F0- lactation, throughout lactation until sacrifice, females, F1- pre-mating, At least 70 days, males, females, F1- mating, Up to 15 days throughout, males, females, F1 - gestation, throughout gestation, females, F1- lactation, throughout lactation until sacrifice, females	See footnotes for full summary ¹	The study reports significant reductions in water consumption in the high dose group relative to controls (including a 18-28% reduction in water intake during gestation and a 24%-32% reduction in water intake during lactation in the P1 dams). Dehydration could contribute to both developmental and adult health outcomes. This is a major source of potential confounding in the high dose group. Significant adverse effects on parental body weight, food consumption and pup body weight during lactation were only reported in the high dose group in the presence of potential confounding by dehydration.	Reproductive/Developmental, Nutritional/Metabolic: Uninformative	Dupont 2006 6547034

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1,1,2-Trichloroethane - Reproductive/Developmental					
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD* Citation and HERO ID
This study was conducted in accordance with the Food and Drug Administration's Good Laboratory Practice Regulations for Nonclinical Laboratory Studies (FDA, 1978). Rat; Sprague-Dawley - [rat]; Both	Oral: Drinking water days Parental males and females: 14 days premating, up to 13 days throughout mating; sperm positive females continued exposure, to PND 21. Reported concentrations in drinking water were 3, 10, and 30 ppm. Time-weighted averages (TWA) were calculated by the study authors; exposure for males during premating was reported to be 0.3, 0.9, and 2.6 mg/kg/day. TWA for females during premating were reported to be 0.3, 1.3, and 3.3 mg/kg/day. Maternal TWA from GD0 to parturition was estimated as 0.3, 1.2, and 3.5 mg/kg/day. Maternal TWA from PND1-PND21 was reported as 0.6, 2.0, and 5.9 mg/kg/day	POD: 3.5 mg/kg/day (NOAEL, reproductive toxicity); 5.9 mg/kg/day (NOAEL, developmental); 2.6 - 5.9 mg/kg/day (NOAEL, parental toxicity) 0, 0, 3, 10, 30 ppm (in air, water, or food) F0- premating, 14 d, F0- mating, 13 d, F0 - gestation, 21 d, F0- lactation, 21 d	See footnotes for full summary ²	None	Reproductive/Developmental, Mortality, Nutritional/Metabolic, Clinical signs: High George et al. 1989 5365

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1,1,2-Trichloroethane - Reproductive/Developmental						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
No test guideline was specified. GLP compliance was not reported. Mouse; ICR - [mouse]; Female	Oral: Gavage 5 days Timed-pregnant animals were treated on gestation days 8-12.	POD: 350 mg/kg/day (LOAEL, mortality) 0, 350 mg/kg-bw/day F0 - gestation, days 8-12	In a developmental toxicity test, timed-pregnant ICR/SIM mice (30/group) were administered 1,1,2-trichloroethane at 0 (vehicle control) or 350 mg/kg/day via gavage on gestation days (GD) 8-12. The vehicle control group was administered corn oil only. Maternal animals were observed for mortality during the treatment period and were allowed to deliver. Maternal animals were weighed on GD 7 and 13, and postnatal day (PND) 1. Animals that did not give birth by GD 21 or 22 were sacrificed and their uteri were examined. Following delivery, the number of litters born, number of litters resorbed, and litter size (PND 1 and 3) were determined. Percentage survival of neonates was determined for PND 1 to 3. Neonates were externally examined and body weights were recorded PND 1 and 3 for determination of 2-day weight gain. Mortality was 0/30 and 3/30 animals in the 0 and 350 mg/kg/day exposure groups, respectively. No effects on maternal body weight gain during the treatment period were observed. All control animals (30/30) produced a litter, and 25/27 surviving animals at the 350 mg/kg/day dose level produced a litter. No significant effects were observed on litter size (number of neonates per litter), neonatal % survival, or neonatal body weights. The LOAEL for maternal animals was 350 mg/kg/day based on mortality at the only dose tested. The NOAEL for developmental effects was 350 mg/kg/day based on no effects on the developmental parameters examined.	Only one dose group was tested, animals were dosed on gestation days 8 to 12, which does not cover the entire period of organogenesis (study was designed as a developmental screening test), and the examinations of neonates were limited to external examinations.	Reproductive/Developmental, Mortality, Nutritional/Metabolic: Medium	Seidenberg et al. 1986 64557
The study was conducted according to OECD TG 414 and was GLP compliant. Rat; CrI:CD (SD) IGS BR; Female	Oral: Drinking water 15 days	POD: 111 mg/kg-day (developmental NOAEL, no adverse effects) 0, 17, 48, 111 mg/kg-bw/day F0 - gestation, GD 6-20	See footnotes for full summary ³	Several endpoints were considered unacceptable to due palatability as a confounding factor. Palatability (resulting in decreased water intake) did not appear to have an impact on development.	Reproductive/Developmental: Low	Will research 2005 6547035

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1,1,2-Trichloroethane - Reproductive/Developmental						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID

* Overall Quality Determination

¹ 6547034: In a two-generation reproduction study, groups of rats (30/sex/concentration) were administered 1,1,2-trichloroethane in the drinking water at a concentration of 0 (control, filtered tap water), 170, 570, or 1350 ppm. After at least 70 days of exposure (premating), P1 males and females were co-housed within their respective treatment groups to produce F1 and F2 litters, respectively. Exposure of parental females continued throughout gestation and lactation; exposure of parental males continued until scheduled sacrifice. At postnatal day 4, litters were culled to 4 pups/sex/litter (litter size permitting) and remaining pups were discarded without further examination. Dams were allowed to deliver and rear their offspring until weaning on postnatal day 21. At the time of weaning, F1 rats (30/sex/group) selected as parental animals were given the same drinking water concentration as their parents, and subsequently mated and allowed to produce a litter similarly to the P1 generation. At the time of weaning, F1 weanlings not selected as parental animals were sacrificed and subjected to gross postmortem examination and gross lesions were retained. Selected organs (brain, spleen, thymus) were weighed for one weanling/sex/litter. After litter production, all P1 and F1 rats were sacrificed (P1 males: test days 112-114, F1 males: test days 108-123; P1 and F1 females: on the day of weaning litters at postnatal day 21) and gross pathological examinations were performed and selected organs were weighed and histologically examined. Non-pregnant P1 and F1 females were sacrificed at approximately 28 days after the end of cohabitation. F2 litters were maintained until postnatal day 21, similarly to F1 litters, and then sacrificed. Samples of mixtures of test substance in the drinking water were analyzed to verify homogeneity, concentration, and stability of the test substance. Based on available stability data, test solutions stored beyond 4 days after preparation were not presented to animals. Daily intakes of the test substance were calculated based on the measurement of water consumption and body weight data during the study and were reported for P1 and F1 animals during premating (males and females), gestation (females), and lactation (females). The overall mean daily test substance intakes for the respective 60, 570, and 1350 ppm groups were: 13.1, 40.6, and 82.2 mg/kg/day for P1 males during premating; 17.0, 52.2, and 102 mg/kg/day for P1 females during premating; 16.0, 49.9, and 102 mg/kg/day for P1 females during gestation; 31.1, 103, and 201 mg/kg/day for P1 females during the first 2 weeks of lactation; 20.8, 67.2, and 162 mg/kg/day for F1 males during premating; 24.7, 82.5, and 173 mg/kg/day for F1 females during premating; 18.1, 61.5, and 126 mg/kg/day for F1 females during gestation; and 31.7, 109, and 230 mg/kg/day for F1 females during the first 2 weeks of lactation. No test substance-related mortalities occurred during the study in P1 and F1 animals. Clinical signs (brown-stained fur) were observed at 570 and 1350 ppm and were not considered adverse. Adverse effects at 1350 ppm included decreases in body weight, body weight gain, food efficiency and water consumption in P1 and F1 females during gestation and lactation; decreased food consumption in P1 and F1 females during lactation; and decreased pup weights in F1 and F2 litters during lactation (days 4-21). No other effects that were considered test substance-related and adverse were observed. The NOAEL for systemic effects for P1 and F1 parental animals was 570 ppm based on decreased body weight, body weight gain, food efficiency, and water consumption during gestation and lactation, and decreased food consumption during lactation; the LOAEL for systemic effects was 1350 ppm. The NOAEL for reproductive effects was 1350 ppm based on no adverse effects at the highest dose tested. The NOAEL for developmental effects for F1 and F2 offspring was 570 ppm based on decreased pup body weight during lactation; the LOAEL for developmental effects was 1350 ppm. The drinking water concentration of 570 ppm was equivalent to a mean daily test substance intake of 40.6-67.2 mg/kg/day for males during premating and 52.2-82.5 mg/kg/day for females during premating and gestation.

- ² 5365: Parental males and females: 14 days pre-mating, up to 13 days throughout mating; sperm positive females continued exposure, to PND 21. Reported concentrations in drinking water were 3, 10, and 30 ppm. Time-weighted averages (TWA) were calculated by the study authors; exposure for males during pre-mating was reported to be 0.3, 0.9, and 2.6 mg/kg/day. TWA for females during pre-mating were reported to be 0.3, 1.3, and 3.3 mg/kg/day. Maternal TWA from GD0 to parturition was estimated as 0.3, 1.2, and 3.5 mg/kg/day. Maternal TWA from PND1-PND21 was reported as 0.6, 2.0, and 5.9 mg/kg/day. Endpoints evaluated included parental mortality (during pre-mating and cohabitation periods and gestational period), parental clinical signs of toxicity, parental body weight, body weight gain, food consumption, and water consumption, reproductive parameters, and developmental parameters. There were no effects on parental mortality and no observations of clinical signs of toxicity. There were no effects on body weight, body weight gain, or food consumption during pre-mating period in males or females. There was a trend for decreased water consumption during the pre-mating period in males and females that suggested a taste aversion to TCEN at 30 ppm. There were no effects on body weight, body weight gain, food consumption or water consumption at any concentration in females during the gestational period or during the lactational period. There were no effects on the number of implantation sites or length of gestation at any concentration. There was a significant increase in pup mortality from implantation to PND 1 at 30 ppm due to a 61% mortality rate in one litter. There were no effects on the number of live pups/litter on PND 1 or 4 at any dose. There were no treatment-related effects on pup body weight on PND 1 or 21, no effects on pup toxicity, and no effects on incidence of pups with external or visceral malformations, including patent ductus arteriosus or cardiac malformations.
- ³ 6547035: Groups of female Crl:CD (SD) IGS BR rats (25/group) were administered 1,1,2-trichloroethane in drinking water at 0, 125, 400, and 1000 ppm (0, 17, 48, and 111 mg/kg-day, respectively, during gestation days (GDs) 6-20. Maternal endpoints evaluated included observations for mortality and moribundity, clinical observations, body weights, body weight gain, food and water consumption, gravid uterine weights, and necropsy. Developmental endpoints included: number of fetuses, early and late resorptions, total implantations, number of corpora lutea, fetal body weights, sex, and external, visceral, and skeletal examinations for variations and malformations. No females died and no clinical signs of toxicity were observed. There were no effects on mean maternal body weights; however, mean maternal body weight gains (GD 6-20), net body weight, and net body weight gain were significantly decreased at 111 mg/kg-day. These weight changes were attributed to decreased water consumption due to palatability issues. At 111 mg/kg-day, food consumption was intermittently significantly reduced on GDs 13, 17, and 19, and was significantly reduced during GDs 17-18 at ≥ 48 mg/kg-day. Mean water consumption (GD 6-20) was decreased in a dose-related manner by 4% 16%, and 24% in the 17, 48, and 111 mg/kg-day groups, respectively, compared with controls. The decreases were significant at the mid and high doses. The decreases were reported to be due to palatability issues. There were no significant effects on any of the developmental endpoints evaluated including no statistically significantly increased incidences of visceral or skeletal variations or malformations. An author reported maternal NOAEL was 48 mg/kg-day based on decreased maternal body weight gain, net body weight, and net body weight gain, and decreased water consumption at 111 mg/kg-day. The developmental NOAEL was 111 mg/kg-day, the highest dose, based on the lack of observed effects.

1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

Isomer: 1,1,1-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
No Guideline listed Rat; Sprague-Dawley - [rat]; Female	i.p. 5 days/week Dose is 10% of the i.p. LD50 for 1,1,1-TCE. Figure 1 reports the test dose as 0.5 g/kg (500 mg/kg) for 1,1,1-TCE.	POD: 500 mg/kg 1,1,1-TCE (NOEL, no significant changes in urinalysis) 0, 0.5g/kg	Sprague-Dawley rats were administered 1,1,1-TCE via i.p. at a dose of 0 and 0.5 g/kg (500 mg/kg) for 5 days/week over 2 weeks. Control animals were administered olive oil (2.5 mL/kg). Urinalysis findings indicated that levels of beta-N-acetylglucosaminidase (NAG), beta-2-microglobulin, and albumin were similar to controls. Other observations related to nephrotoxicity were evaluated and reported for other substances tested in this study, but these weren't reported for 1,1,1-TCE.	IP dosing is not a typical exposure route for humans. Other than urinalysis no observations related to kidney toxicity listed	Renal/Kidney: Medium	Bernard et al. 1989 64580
The study did not report any compliance methods or guidelines adhered to. Mouse; CFW (ChasRiver Swiss) albino; Male	Inhalation: Vapor 0.5 hours	POD: 11,025 mg/m3 (NOAEL, behavior) (2,000 ppm) 0, 500, 1000, 2000, 4000, 6000 ppm (in air, water, or food)	Mice were exposed to 0, 500, 1,000, 2,000, 4,000, 6,000, 8,000, 10,000, 12,000, and 14,000 ppm for the locomotor activity test. Concentrations were converted using the formula (ppm * mw)/24.2 = (2,000 ppm * 133.4 g/mol)/24.2 = 11,025 mg/m3. Adult male CFW albino mice (n=10) were exposed to 0, 500, 1,000, 2,000, 4,000, 6,000, 8,000, 10,000, 12,000, and 14,000 ppm (0, 2,756, 5,512, 11,025, 22,050, 33,074, 44,100, 55,123, 66,149 or 77,174 mg/m3) of 1,1,1-trichloroethane via inhalation for 30 minutes in a static chamber. Locomotor activity was monitored daily for 30 minutes one week before exposure. Locomotor activity was then monitored during the entire 30 minute exposure period. Vapor exposures were conducted on Tuesdays and Fridays in ascending order (air-only sessions and locomotor activity was monitored on Monday, Wednesday and Thursdays). The same mouse received all exposures. Locomotor activity returned to baseline during air-only sessions. A significant dose-related biphasic increases in locomotor activity was seen at ≥4,000 ppm compared to control. The greatest activity was seen at 10,000 ppm which then decreased at 12,000 and 14,000 ppm (yet still remained significantly increased).	The study used a static inhalation chamber to deliver the test substance and is therefore deemed unacceptable.		Bowen and Balster 1998 5454703

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Isomer: 1,1,1-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The study did not report any compliance methods or guidelines adhered to. Mouse; CFW (ChasRiver Swiss) albino; Male	Inhalation: Vapor 0.5 hours	POD: 11,025 mg/m3 (NOAEL, behavior) (2,000 ppm) 0, 1000, 2000, 4000, 8000, 10000 ppm (in air, water, or food)	Concentrations were converted using the formula (ppm * mw)/24.2 = (2,000 ppm * 133.4 g/mol)/24.2 = 11,025 mg/m3. Adult male CFW albino mice (n=7) were trained for approximately 6 months to press a lever for liquid reinforcement under a multiple FR-FI schedule of reinforcement. A separate group of mice (n=7) were trained for approximately 2 months to lever press under a simple FI schedule of reinforcement. These mice were then exposed to 0, 1,000, 2,000, 4,000, 8,000, 10,000, 12,000 ppm (0, 5,512, 11,025, 22,050, 44,100, 55,123 or 66,149 mg/m3) of 1,1,1-trichloroethane via inhalation for 30 minutes in a static chamber. Response rates were monitored during the 30 minute exposure. The same mouse received all exposures. Vapor concentrations were tested in ascending order. Response rates were significantly decreased in the multiple FR-FI operant test at ≥4,000 ppm and in the FI only test at ≥8,000 ppm compared to control.	The study used a static inhalation chamber to deliver the test substance and is therefore deemed unacceptable.		Bowen and Balster 1998 5454703
Study does not report any compliance methods adhered to. Rabbit; New Zealand; Male	Inhalation: Vapor 1 hours	POD: 31,000 mg/m3 (NOAEL, cardiac, clinical signs) (5600 ppm) 0, 5600 ppm (in air, water, or food)	See footnotes for full summary ¹	There were minor omissions of study details (e.g., husbandry) and respiratory rates were not measured.	Cardiovascular, Clinical signs: Medium	Carlson 1981 29371
pre-guideline Rat; Albino; Male	Inhalation: Vapor 2 hours none	POD: 72,052 mg/m3 (NOAEL, liver) (13,070 ppm) 0, 11,600, 13,070 ppm (in air, water, or food)	Concentrations were converted using the formula: (ppm * mw)/24.2 = mg/m3; 13,070 ppm * 133.41 g/mol /24.2 = 72,052 mg/m3. Adult male albino rats were injected i.p. with either saline for 4 days (control for 11,600 ppm group) or corn oil for 2 days (control for 13,070 ppm group) prior to test substance exposure (served as controls for other experiments). Rats (5/group) were then exposed for 2 hours to 0, 11,600 or 13,070 ppm (0, 64,214 or 72,052 mg/m3) of 1,1,1-trichloroethane via whole body inhalation and sacrificed 24 hours later. Endpoints evaluated included mortality, body weights, liver weights, serum AST (SGOT), ALT (SGPT) and hepatic glucose-6-phosphatase levels. No rats died during the study. Body weights were not reported. Relative liver weight, serum AST, ALT and hepatic glucose-6-phosphatase levels were not different from control.	Test substance is a respiratory irritant and therefore respiratory rate should be provided. Number of air changes was not provided.	Hepatic/Liver: Medium, Mortality: Medium	Carlson 1973 29336

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

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Isomer: 1,1,1-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
None reported Rat; Sprague-Dawley - [rat]; Male	intraperitoneal injection 1 days/week 1 days Rats were treated with a single i.p. injection. Conversion of dose: 10 mmol/kg = 1334 mg/kg (based on MW = 133.40 g/mol)	POD: 1334 mg/kg (NOAEL, no effects (10 mmol/kg)) 0, 10mmol/kg	Sprague-Dawley rats (6 males/group) were administered a single dose of corn oil (10 mL/kg) via gavage. Eighteen hours later, 10 mmol/kg of 1,1,1-trichloroethane was administered as a single dose via intraperitoneal injection. A second group of six males remained untreated and served as controls. Endpoints included plasma alanine aminotransferase (ALT) activity and histopathology of liver. No effects on plasma ALT activity or histological changes in the liver were observed in animals exposed to 1,1,1-trichloroethane compared to controls. The NOAEL was 10 mmol/kg (1334 mg/kg) based on no treatment-related effects at the only dose tested.	Only one dose was tested and only one sex was tested.	Hepatic/Liver: Medium	Charbonneau et al. 1991 660794
Adherence to a test guideline was not specified. The study was GLP compliant. Rat; Fischer 344 - [rat]; Both	Inhalation: Vapor 4 hours/day 1 days single 4-hour exposure; target concentrations were 15,000, 18,000, and 22,000 ppm and nominal concentrations were 14,817, 17,532, and 20,231 ppm.	POD: 99,223 mg/m3 (18,000 ppm; LC50, death) 15523, 18425, 21053 ppm (in air, water, or food)	See footnotes for full summary ²	Negative results from the clinical observations were not reported.		Dow Chemical, 1988 5466898
Adherence to a test guideline was not specified. The study was GLP compliant. Rat; Fischer 344 - [rat]; Male	Inhalation: Aerosol 4 hours/day 1 days the final, highest concentration tested was 36,700 mg/m3; single 4-hour exposures	POD: >36,700 mg/m3 (LC50, death) 16200, 17000, 17200, 19100, 19300, 19700 mg/m^3	See footnotes for full summary ³	Clinical observations were not tabulated and were generally reported in the text.		Dow Chemical, 1988 5466898

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

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Isomer: 1,1,1-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
Adherence to a test guideline was not specified. The study was GLP compliant. Rat; Sprague-Dawley - [rat]; Male	Inhalation: Aerosol 4 hours/day 1 days single 4-hour exposure	POD: >34,500 mg/m3 (LC50, death) 34500 mg/m^3	Study 2: OTS0509711-6, 89-880000192, 8EHQ-0688-0535 "An acute inhalation study of aerosolized 1,1,1-trichloroethane in rats with cover letter dated 061688" In an acute inhalation toxicity test, male Sprague-Dawley rats (5 total) were exposed to a solution of Aerothene TT (Lot No. TA 8611112, composed of 94.53% 1,1,1-trichloroethane, 2.64% dimethoxymethane, 1.98% tert-butyl alcohol, and 0.74% butylene oxide) for 4 hours. The test substance was generated as an aerosol, but vapors and aerosols were present in the test chambers. Animals were exposed to a concentration of 34,500 mg/m3 in 1,000 L chambers with an air flow of 290 L/min at 20 psi. The test substance with air was sprayed directly from the top of the chambers into the chamber, located approximately 1.2 M to the rats. Animals were observed for 2 weeks following the exposure. Endpoints evaluated included mortality, clinical signs of toxicity, nervous system activity, bodyweights, complete gross pathology examinations, and detailed eye examinations. No mortality was observed. Hypoactivity was observed during the exposure period and a decreased responsiveness to noise was observed towards the end of the exposure period. Uncoordinated gait was observed during the exposure period and immediately following the exposure in animals exposed to 34,500 mg/m3. All rats appeared normal by day 2 and for the remainder of the observation period. Bodyweights were decreased in 3/5 animals on day 2, but increased through the remainder of the observation period, and were higher than starting bodyweights by the end of weeks 1 and 2. No gross pathological changes were observed.	Clinical observations were not tabulated and were generally reported in the text.		Dow Chemical, 1988 5466898

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Isomer: 1,1,1-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The study pre-dates use of OECD TG or GLP practices. Rabbit; Not specified; Unknown	Dermal 24 hours	POD: ~10,000 mg/kg (LD50, dermal) 3980, 7950, 15800mg/kg	Undiluted 1,1,1-trichloroethane was applied to the skin of Rabbits (4-8/group; strain and sex not specified) at doses of 3,980, 7,950, and 15,800 mg/kg, under occlusive conditions, for 24 hours. Animals were assessed for mortality and for local effects to the skin. Deaths were observed in 0/4, 3/8, and 1/8 animals in the 3,980, 7,950, and 15,800 mg/kg groups, respectively. Localized effects included slight edema and denaturation at 3,980 and 7,950 mg/kg. At 15,800 skin was severely burned with severe edema. A dermal rabbit LD50 was reported to be "of the order of" 10,000 mg/kg; a definitive LD50 value was not provided.	The duration of animal observations was not specified. No irritation scores were provided; it is unknown if reversibility of the effects (in animals that survived) were assessed. The study did not include monitoring of body weights or gross and/or microscopic examinations which are included in the current OECD TG 402 for acute dermal toxicity. The doses exceed current recommendations for a limit test.		Dow Chemical 1956 725343
non-guideline Mouse; Swiss Webster - [mouse]; Female	Inhalation: Vapor 17 hours exposed up to 1000 minutes and monitored for anesthesia and death, a subgroup was evaluated for ALT (SGPT activity)	POD: 13500 ppm (74423 mg/m3) (LOAEL, based on increased ALT (SGPT), anesthesia, and mortality) 0, 13500 ppm (in air, water, or food)	Female Swiss Webster mice (9-25/group) were exposed to 1,1,1 trichloroethane vapor (likely whole body) at 13500 ppm (corresponding to 74423 mg/m3 calculated using MW= 133.41) for up to 1000 hours. Groups of 20 mice were evaluated for clinical signs of anesthesia and mortality, and another group was evaluated for blood levels of ALT (SGPT). LT50 (duration of exposure that produced death in 1/2 the rats tested) was determined to be 595 minutes (95% CI: 578-615 min). ET50 for anesthesia (duration of exposure that produced anesthesia in one-half of the exposed mice) was calculated to be 16.3 minutes (95% CI: 15.4-17.2 min). ET50 for ALT (SGPT) activity (duration of exposure that produced anesthesia in one-half of the exposed mice) was greater than or equal to 595 minutes.	single dose only, exposure durations were variable. ALT (SGPT) was only measure of hepatic effect, non-guideline study		Ghering 1968 29227
non-guideline Mouse; Swiss Webster - [mouse]; Female	I.P. once single administration: doses were not reported.	POD: LD50 = 4696 mg/kg (35.2mmol/kg) 0mg/kg	Female Swiss Webster mice (9-25/group) were administered a single dose of 1,1,1 trichloroethane dissolved in corn oil via I.P injection. The doses to reach LD50 and ED50 for ALT (SGPT) activity were reported. LD50 = 35.2mmol/kg (corresponding to 4696 mg/kg calculated using MW= 133.41). The ED50 for ALT (SGPT) activity (duration of exposure that produced increased ALT levels in one-half of the exposed mice) is 21.8 mmol/kg (corresponding to 2908 mg/kg).	doses not reported, only the dose at which LD50 and ED50 (ALT/SGPT) occurred were reported, ALT/SGPT was only measure of hepatic effect, non-guideline study		Ghering 1968 29227

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Isomer: 1,1,1-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
Non-guideline study Dog; Cross-bred; Both	Inhalation: Vapor 4 hours/day 1 days Acute 4 hour exposure	POD: 3859 mg/m3 (LOAEC, immune effects) (700 ppm) 0, 700 ppm (in air, water, or food)	In an acute 4-hour inhalation exposure, Beagle dogs were treated with 1,1,1-trichloroethane (isomer of 1,1,2-trichloroethane) at 700 ppm (3859 mg/m3). Endpoints assessed included limited hematology only (WBC differential counts, RBC and platelet counts, and hematocrit). A LOAEC of 700 ppm (3859 mg/m3) was established based on immune effects (decreased WBC counts and alterations in WBC differentials). The concentration for the study-wide POD is converted from ppm to mg/m3 using the equation [(ppm * mw)/24.2 = mg/m3], where mw = molecular weight of the chemical (133.4 g/mol), and 24.2 = molar volume at 1 atm and 22°C.	Uncertainties about test animals and unacceptable issues with statistics. Although Unacceptable, the study may still contribute to a weight-of-evidence.	Im-mune/Hematological: Uninformative	Hobara et al. 1984 75061
Non-guideline study Dog; Cross-bred; Both	Inhalation: Vapor 1 hours/day 1 days Acute 1 hour exposure. All of the concentrations utilized in this study were as follows (not enough fields provided in this form): 0, 200, 500, 700, 1000, 1500, 2000 ppm.	POD: 1102 mg/m3 (NOAEC, immune effects) (200 ppm) 0, 200, 500, 700, 1000, 1500 ppm (in air, water, or food)	In an acute 1-hour inhalation exposure, Beagle dogs were treated with 1,1,1-trichloroethane (isomer of 1,1,2-trichloroethane) at 200, 500, 700, 1000, 1500, or 2000 ppm. Endpoints assessed included limited hematology only (WBC differential counts, RBC and platelet counts, and hematocrit). A NOAEC of 200 ppm (1102 mg/m3) was established based on immune effects (decreased WBC counts and alterations in WBC differentials). The concentration for the study-wide POD is converted from ppm to mg/m3 using the equation [(ppm * mw)/24.2 = mg/m3], where mw = molecular weight of the chemical (133.4 g/mol), and 24.2 = molar volume at 1 atm and 22°C.	Uncertainties about test animals and unacceptable issues with statistics. Although Unacceptable, the study may still contribute to a weight-of-evidence.	Im-mune/Hematological: Uninformative	Hobara et al. 1984 75061
Non-guideline study Dog; Cross-bred; Both	Injection once Single dose via injection. It appears that negative controls used for the inhalation portion of the study also served as controls for the injection portion of the study. Negative controls were exposed to fresh air only. It is unclear whether negative controls were sham-treated (i.e. restrained in the same manner as inhalation treated groups), and if so, for how long, as there were two inhalation exposure durations (1 hr, 4 hr) included in the study.	POD: 50 mg/kg (LOAEL, immune effects) 0, 50 mg/kg-bw/day	In an acute single-dose injection study, Beagle dogs were treated with 1,1,1-trichloroethane (isomer of 1,1,2-trichloroethane) at 50 mg/kg. Endpoints assessed included limited hematology only (WBC differential counts, RBC and platelet counts, and hematocrit). A LOAEL of 50 mg/kg was established based on immune effects (decreased WBC counts and alterations in WBC differentials).	Uncertainties about test animals and unacceptable issues with statistics. Although Unacceptable, the study may still contribute to a weight-of-evidence.	Im-mune/Hematological: Uninformative	Hobara et al. 1984 75061

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

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Isomer: 1,1,1-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
No guidelines specified. Mouse; Swiss Webster - [mouse]; Male	intraperitoneal injection single dose Single i.p injection of 1,1,1-trichloroethane	POD: 3335 mg/kg (ED50, liver) 0, 2.0, 2.5, 2.75mL/kg	See footnotes for full summary ⁴	Study does not report the exposure doses used. Only LD50, ED50, LD10 and doses used in the ethanol studies were the only reported.		Klassen and Plaa 1965 64549
None Dog; Mongrel; Both	Intraperitoneal injection Single Animals received a single intraperitoneal dose. Dose levels were not reported for the PSP test.	POD: 4400 mg/kg-bw (LD50) 0, 0.75, 1.05, 2.5, 3.5mL/kg-bw	This form is for 1,1,1-trichloroethane. Dogs were administered a single intraperitoneal dose of 1,1,1-trichloroethane and observed for mortality for 24 hours after dosing. Liver and kidney effects were also assessed at 24-48 hours after a single dose. The LD50 was 4400 mg/kg-bw (3.1 mL/kg-bw). Effects on liver (increased SGPT activity at 1500 mg/kg-bw, histopathological lesions [moderate neutrophilic infiltrations in the sinusoids and portal areas at 3500 mg/kg-bw; subcapsular necrosis at unreported doses] and kidney (histopathological lesions [slight calcification of the tubules] at 3500 mg/kg-bw) were reported, but NOAEL and LOAEL values could not be reliably determined. Author-reported units (mL/kg-bw) were converted to mg/kg-bw as follows: mL/kg*density of 1.41 g/mL*1000 mg/g.	Only 1-3 animals were used per dose level, restricting statistical analysis. Detailed data were not provided for liver and kidney effects (e.g., no quantitative data for SGPT activity or PSP excretion; incidence of histopathological lesions not reported at each dose). The small group size, along with the lack of detailed quantitative results, precluded the determination of reliable NOAEL and LOAEL values for liver and kidney effects. In addition, there was variability among animals in body weight (range of 7-14 kg) and breed (described as "mongrel"), which may have increased the variability in results.	Mortality: Medium, Hepatic/Liver: Uninformative, Renal/Kidney: Uninformative	Klaassen and Plaa 1967 64550
pre-guideline study Rat; Sprague-Dawley - [rat]; Male	intraperitoneal Once Doses were not reported.	POD: LD50: 5016 mg/kg 0ml/kg	The density of 1,1,1- trichloroethane is 1.32 g/ml or 1320 mg/ml. LD50 was converted using the following formula: 1320 mg/ml *3.8 ml/kg = 5016 mg/kg. In a lethality study, male Sprague-Dawley rats (5-10/group) were administered a single i.p injection of 1,1,1-trichloroethane (4-5 groups were studied, doses were not reported). The number of deaths after 24 hours were recorded and LD50 determined. An LD50 of 3.8 ml/kg (5016 mg/kg) was reported.	Doses administered were not reported.	Mortality: Low	Klaassen and Plaa 1969 9913

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Isomer: 1,1,1-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
pre-guideline study Rat; Sprague-Dawley - [rat]; Male	intraperitoneal Once none	POD: 3762 (NOAEL, hepatic) 0, 3762 mg/kg-bw/day	LD50 was calculated to be=5016 mg/kg. 0.75 x LD50 of 5016 mg/kg = 3762 mg/kgMale Sprague-Dawley rats (3/timepoint) were administered a single i.p injection of 1,1,2-trichloroethane (0.75 x LD50; calculated by reviewer to be 3762 mg/kg). Rats were sacrificed at 0, 1.5, 3, 6, 12, 24 and 36 hours post-injection. Endpoints included levels of liver triglycerides, glucose-6-phosphatase and lipid peroxidation. Levels of liver triglycerides did not change over time course (1.5 hour ot 36 hours). Data from the 0 hour timepoint were not reported, therefore a NOAEL/LOAEL call was not made for this endpoint since it can not be determined if the response is significantly different from control. Throughout the time course, no change in the liver levels of glucose-6 phosphatase or lipid peroxidation were seen compared to levels at 0 hour.	none	Hepatic/Liver: Uninformative	Klaassen and Plaa 1969 9913
This was a non-guideline, non-GLP study. Guinea pig; Not specified; Unknown	Dermal 16 hours Animals were exposed for 15 minutes, or for 1, 4, or 16 hours.	POD: Uninformative, not suitable for POD determination 1mL	Guinea pigs were dermally exposed to 1,1,1-trichloroethane for 15 minutes or for 4 or 16 hours. Exposures were done by applying 1mL of the test material through a hole in the cover glass of presumably four glass ring chambers placed on the clipped-back skin of guinea pigs to minimize exposure via other routes. The hole was sealed after application. After each exposure period, the glass rings were removed, and whole skin specimens were removed and fixed for histopathological analysis. Skin samples from non-exposed adjacent sites were taken as controls. No macroscopic skin changes were observed. After 15 minutes, pyknotic nuclei were seen in all layers of the epidermis. Pyknosis and karyolysis increased with exposure time. Slight perinuclear oedema was observed at all collection times. Marked intracellular oedema (spongiosis) and focal junctional separation were observed after 15 minutes; after 1 hour, only solitary epithelial cells remained attached to the basement membrane and the area was fully replaced by junctional separation after 4 and 16 hours. Slight, diffuse pseudoeosinophilic infiltration was noted in the upper part of the dermis after 4 hours and was severe after 16 hours.Exposure to the test substance caused pathological changes to the skin. Accurate dosing cannot be determined, precluding the ability to identify a reliable toxicity value. Therefore, a POD was not identified.	Study only evaluated localized skin effects following dermal exposure. It is unclear whether accurate dosing can be estimated due to the limitations in the study details and whether or not a single animal received multiple exposures.		Kronevi et al 1981 58151

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

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Isomer: 1,1,1-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
No guideline or adherence to GLP was specified. Rat; Sprague-Dawley - [rat]; Female	IP 1 days Single IP administration study. This form is for 1,1,1-trichloroethane.	POD: 455 mg/kg (NOEL, liver) 0, 227, 455, 909mg/kg	Female Sprague Dawley rats (6/group) were administered a single IP dose of 1,1,1 trichloroethane in peanut oil at doses according to geometric series. Exact dose levels were not reported. LD50 values were calculated based on the number of deaths at 24 hours and 14 days. 24 hour and 14 day LD50 values were calculated to be 7272 mg/kg and 3593 mg/kg, respectively. Hepatotoxicity was also evaluated. 1,1,1 trichloroethane was IP injected into groups of 6 rats at doses of 1/8, 1/16, and 1/32 of the 24hr LD50. The precise dose levels were not reported, however, the 24hr LD50 for 1,1,1 trichloroethane is 7272 mg/kg, so the dose levels in the hepatotoxicity study were calculated to be 227, 455, and 909 mg/kg. Animals were sacrificed 18 hours after test substance administration and serum SDH levels were determined. Control animals were injected with 1 ml of peanut oil. No other measures of hepatotoxicity were evaluated. Mean SDH activity was increased in animals of the highest treatment group. Study authors did not identify a NOAEL or LOAEL, but based on the increase in SDH activity, a NOEL of 455 mg/kg is proposed based on a slight increase in SDH activity at the LOEL of 909 mg/kg. The adversity of this affect is not clear.	SDH activity was the only marker of hepatotoxicity that was measured. The number of dose groups and dose levels was not reported for the acute lethality study.		Lundberg et al. 1986 62934
None Rat; Osborne-Mendel - [rat]; Male	Oral: Gavage Single dose Initiation protocol	POD: No evidence of tumor initiation was observed at 3000 mg/kg 0, 3000 mg/kg-bw/day	Rats that had been subjected to partial hepatectomies were administered one gavage dose of 1,1,1-TCE at 3000 mg/kg. After 5 days, animals were given either 7 weeks of phenobarbital-containing diet followed by 1 week of control diet or 8 weeks of control diet. At study termination, livers were examined histopathologically for GGT-positive foci. No increase in foci was observed in animals with or without phenobarbital. No effects were observed on body weight, body weight gain, or absolute or relative liver weights in either group.	The primary purpose of this study was to evaluate the tumor initiation and promotion potential of the chemical. Effects on body and liver weights were not the primary purpose of the study, and only minimal details are provided for these endpoints.	Cancer/Carcinogenesis: High	Milman et al. 1988 200479
None reported Mouse; CD-1 - [mouse]; Male	Inhalation: Vapor 1 days/week 1 days 30 minute exposure	POD: 20,000 mg/m3 (NOAEL, neurological) 0, 1800, 3600, 7200, 10800 ppm (in air, water, or food)	Mice exposed for 30 minutes to 1,1,1-trichloroethane at concentrations ≥ 7200 ppm by inhalation in a static chamber exhibited changes in fixed interval responding, with initial decreases followed over time by increases relative to control	Static exposure chamber		Moser and Balster 1986 95470

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Acute (less than or equal to 24 hr)

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Isomer: 1,1,1-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The study did not report any compliance methods or guidelines adhered to. Rat; Wistar - [rat]; Both	intraperitoneal 3 hours/day	POD: 1000 mg/kg/day (LOAEL, body weight) 0, 1000 mg/kg-bw/day	Seven-week old Wistar rats (4-6/sex/group) were administered 0 or 1000 mg/kg/day of 1,1,1-trichloroethane in corn oil via i.p. injection for 3 days. Animals were sacrificed 24 hours after last treatment. Endpoints evaluated included body weight, liver and lung weight, and monooxygenase activity and protein content (CYP1A, 2B, 2E1 and 3A) in the liver and lungs. Body weight gain was significantly decreased in males (-17.7%) and females (-6.2%) compared to the respective controls. Relative liver weight was significantly decreased in females (16%) and relative lung weight was significantly increased in males (13%) compared to control. Absolute organ weights were not reported. The changes in relative lung and liver weights maybe a reflection of the decreased body weight and not direct effects on organs. Hepatic CYP2E1 activity was significantly suppressed in both sexes and hepatic CYP3A activity was increased in females compared to control. In the lungs, activity of CYP2B was significantly decreased in males, but increased in females. Study also investigated effects of phenobarbital in the presence/absence of 1,1,1-trichloroethane on endpoints.	No major limitations	Hepatic/Liver, Nutritional/Metabolic, Lung/Respiratory: High	Nakahama et al. 2000 5465638
The study did not report adherence to a guideline; GLP compliance was not specified. Mouse; Princeton strain; Male	Subcutaneous 1 days Animals received single subcutaneous injections of 39, 78, 100, and 120 mM/kg and 50, 98, and 200 mM/kg	POD: 11,206 mg/kg (ED50, sleeping time) 0, 39, 78, 100, 120mM/kg	See footnotes for full summary ⁵	This study had limitations in data reporting of histopathology results. Additionally, based on the information available, it does not appear histology was performed on an untreated control group.		Plaa et al. 1958 29447

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Isomer: 1,1,1-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The study pre-dates OECD guidelines. The study cites FREE, H. M., and FREE, A. H. (1961). Micro-urinalysis in small animals. Proc. Intern. Congr. Biochem. 5th, Moscow, 1961 p.520. Macmillan (Pergamon), New York. Mouse; Swiss - [mouse]; Male	intraperitoneal single dose	POD: 3300 mg/kg (NOAEL, mortality) 0, 2.5, 5.0ml/kg	The density of 1,1,1 trichloroethane is 1.32 g/ml POD was based on mortality. POD was determined by the following formula: density (g/ml) * ml/kg administered = mg/kg. 1320 mg/ml * 2.5 ml/kg = 3300 mg/kg Male Swiss mice (10/group) were administered 2.5 or 5 ml/kg of 1,1,1 trichloroethane (3300 or 6600 mg/kg, respectively) intraperitoneally once. 24 hours after injection mortality and urinary protein and glucose (via Combistix test strip) were evaluated. 7/10 mice died at 5 ml/kg and 1/10 mice died at 2.5 ml/kg. Urinary protein was increased in 1/9 mice at 2.5 ml/kg. No increase in urinary glucose was seen at either dose.	Limited details about the test substance and test model were provided. Details of the negative control are not reported.		Plaa and Larson 1965 64411
No specific guideline or compliance methods were mentioned. Rat; Sprague-Dawley - [rat]; Male	intraperitoneal Single dose Chemical treatment was administered by a single i.p. injection. Rats were anaesthetized for evaluation 24 hours after treatment.	POD: 2134 mg/kg (LOAEL, hepatic) 0, 16mmol/kg	Dose was converted using the following equation: 16 mmol/kg * 133.4 mg/mmol= 2,134 mg/kg. Male Sprague-Dawley rats were administered corn oil or 16 mmol/kg (2134 mg/kg) of 1,1,1-trichloroethane in corn oil once via i.p injection. Rats were sacrificed 24 hours after injection. Endpoints evaluated included plasma AST, ALT, LDH and urea and liver weight. Plasma AST was significantly increased (~3-fold) compared to control. No change in plasma ALT, LDH or serum urea were seen. Relative liver weight was significantly decreased (~15%) compared to control, however body weight and absolute liver weight were not reported, therefore it is not possible to determine in the decrease is possibly due to increased body weight. Elements of this study that are not PECO-relevant contain information that may be relevant to identification of potentially exposed or susceptible subpopulations (PESS). In rats treated with multiple chlorinated hydrocarbons simultaneously, the authors report evidence for an interaction between 1,1,1-trichloroethane and chloroform exposures for liver toxicity endpoints.	The study reports limited details of methods (including sample preparation, age of animals, animal husbandry conditions, randomization, outcome assessment methodology). The study evaluated effects at a single dose level and was not designed to provide dose-response information.		Stacy 1989 5465564

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Isomer: 1,1,1-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
No specific guidelines or compliance methods were mentioned. The study design was not similar to any standard guidelines. Guinea pig; Not specified; Unknown	Dermal Single Dose a 2.0 mL volume of undiluted test substance was percutaneously applied to the skin of guinea pigs. The mean body weights of animals in the control and treatment group was provided. Using a compound density of 1.32 g/mL, a mean body weight of 0.375 kg (for the treatment group), the calculated dose in mg/kg is 7,040 mg/kg.	POD: 7,040 mg/kg, (NOAEL, no adverse effects) 0, 2mL	A 2.0 mL volume was percutaneously applied to the clipped-back skin of guinea pigs (20/group). The same volume of distilled water was applied to a group of control animals. Applications were done in Skin depots (glass rings glued onto the skin, covering about 0.7% body area). Areas were then covered with glass in order to exclude licking or inhalation. Animals were monitored for 35 days for clinical signs (no data reported), mortality, body weight, and bodyweight gains. No deaths were observed. Significantly decreased weekly body weights were observed starting on Day 7; however, the magnitudes of change were low, and not considered to be toxicologically relevant. Compared to controls, the decreases were 8%, 8%, 6%, 8%, and 9% on study days 7, 14, 21, 28, and 35, respectively. NOAEL and LOAEL values were not reported. A NOAEL of 7,040 mg/kg was determined based on the lack of significant adverse effects.	Limited study details were provided. Some additional experimental details were provided in referenced citations.	Nutritional/Metabolic: Medium	Wahlberg and Boman 1979 61688
No specific guidelines or compliance methods were mentioned. The study design was not similar to any standard guidelines. Guinea pig; Not specified; Unknown	intraperitoneal Single Dose A single 2.0 mL volume of undiluted test substance was injected intraperitoneally into guinea pigs (10/group). Control animals received distilled water. The mean body weights of animals in the control and treatment groups were provided. Using a compound density of 1.32 g/mL, and a mean bodyweight of 0.375 kg (for the treatment group), the calculated dose in mg/kg is 7,040 mg/kg.	POD: 7,040 mg/kg, (LOAEL, mortality) 0, 2mL	Guinea pigs (10/group, sex and strain not specified), were injected i.p. with 2mL of undiluted test substance (equivalent to 7,040 mg/kg). Control animals were given an equal volume of distilled water. Animals were monitored for 35 days for clinical signs (no data reported), mortality, and possibly body weight (no data reported). No deaths in the control group were observed. In the treatment group, 1 death was reported after 1 hour, and an additional 7 deaths occurred within 2 hours (cumulative = 8 deaths); no other deaths occurred. The final mortality rate was 80%. LD50 values were not reported	Limited study details were provided. Some additional experimental details were provided in referenced citations.	Mortality: Medium	Wahlberg and Boman 1979 61688

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Isomer: 1,1,1-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The study did not report which, if any, compliance methods or guidelines were adhered to. Rat; Sprague-Dawley - [rat]; Male	Inhalation: Vapor 0.25 hours	POD: 43,652 mg/m3 (NOAEL, sensorimotor); 8000 ppm 0, 1000, 2000, 4000, 8000 ppm (in air, water, or food)	Concentration conversion: The mw of 1,1,1-trichloroethane is 133.41 g/mol. Using the formula (mw * ppm)/24.5= mg/m3 the following calculation was performed: (133.41 * 8000 ppm)/24.45= 43,652 mg/m3 Adult male Sprague-Dawley rats (n=12) were exposed to either 0, 1000, 2000, 4000 or 8000 ppm of 1,1,1-trichloroethane for 15 minutes via whole body inhalation (each rat was exposed to each concentration randomly). Immediately after exposure, rats were placed into a startle chamber to begin the startle session. If a low-intensity stimulus is presented prior to a high-intensity stimulus, the startle response to high-intensity stimulus can be attenuated (referred to as "pre-pulse inhibition"). The startle amplitude was measured after exposing rats to: 1) a 120 dB [A] acoustic stimulus for 40 msec (pulse trials), 2) an 85 dB[A] pre-pulse acoustic stimulus (20 msec duration) followed 100 msec later by a 120 dB[A] pulse (pre-pulse + pulse trial), 3) an 85 dB[A] pre-pulse alone, or 4) a 69 dB [A] background noise. The 85 dB[A] alone and 69 dB[A] trials served as control to measure the degree of variability in the procedure. The session consisted of a pulse trial first, followed by 10 of each of the four trial types (tested randomly). Test sessions were separated by at least 72 hours. The order of concentrations tested was randomized across each group. Acoustic startle amplitude after pulse trials (120 dB[A] stimulus) was not significantly different from control. The pre-pulse inhibition of acoustic startle was not different from control.	A static inhalation chamber was used, therefore this study is deemed unacceptable.		Wiley et al. 2001 5465795

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Isomer: 1,1,1-Trichloroethane - Acute (less than or equal to 24 hr)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
Non-guideline study; not GLP compliant. Rat; Wistar - [rat]; Female	Oral: Gavage 1 days Animals were administered a single dose via gavage	POD: 667 mg/kg (NOAEL), based on lack of evidence of hepatotoxicity 0, 5mmol/kg	Wistar rats (females; number per group not specified), were administered a single dose of 1,1,1-trichloroethane in arachidic oil via gavage, at 0 and 5 mmol/kg. Animals were sacrificed 6, 12, 24, 36, 48, and 72 hours after dosing. Blood was collected for serum measurements of sorbitol dehydrogenase (SDH), GPT (or alanine aminotransferase - ALT), and glutamate dehydrogenase (GDH), and livers were fixed for microscopic examinations. Serum measurements showed a small, but significant increase in SDH at 24 hours, and no changes in GDH and GPT, compared with controls. Microscopic examinations showed no damage to the livers at any time point. In rats treated with the test substance and sacrificed at 24 hours, the total free radical concentrations were comparable to controls. Separate experiments were done using isolated perfused rat livers. The perfusate contained up to 5 mmol/L of 1,1,2-trichloroethane, and isolated rat livers were perfused at a rate of 12 ml/min, for 30 minutes. Collections were made at 0, 0.5, 1.0, 1.5, 2.0, and 3.0h after the addition of the test substance. In perfusate, levels of SDH, GDH, and potassium increased over time, becoming significant at 3 hours. Effects due to exposure to 1,1,1-trichloroethane were less pronounced than those observed for 1,1,2-trichloroethane. A NOAEL of 5 mmol/kg (or 667 mg/kg) was determined for this review for the lack of evidence of hepatotoxicity. A mechanistic LOEL of 5 mmol/kg (or 667 mg/kg) was determined for changes in perfusate levels of DH, GDH, and potassium.	The number of animals used in the study was not specified.	Hepatic/Liver: Medium	Xia and Yu 1992 659098

* Overall Quality Determination

¹ 29371: Calculations: The following formula was used to convert ppm to mg/m3: (ppm * mw)/24.45 = mg/m3(5600 ppm * 133.41 g/mol) /24.45 = 30,556 mg/m3 or 31,000 mg/m3 (maintaining significant figures)Male New Zealand rabbits (n=9) were exposed to 0 or 5600 ppm (31,000 mg/m3) of 1,1,1-trichloroethane (98% pure) via inhalation for up to 60 minutes. A lead EKG was recorded using a Grass model 5 polygraph. No spontaneous arrhythmias were seen in any animals prior to exposure. No apparent distress or irritation was seen in rabbits during exposure. This study looked at the effects of 1,1,1-trichloroethane on epinephrine induced arrhythmias. At 0, 7.5, 15, 30, 45, 60 minutes of exposure and 15 and 30 minutes post-exposure, 1, 2, or 3 ug/kg of epinephrine was delivered to the animal via a 23 G butterfly infusion set placed in the marginal ear vein. Arrhythmia were recoded at each time point. Epinephrine did not induce arrhythmias when administered prior to 1,1,1-trichloroethane exposure (time 0). Incidences of arrhythmias (premature ventricular contractions) increased with exposure time at each dose of epinephrine and increased with increasing dose of epinephrine (11-25% at 1 ug/kg; 22-78% at 2 ug/kg; and 22-89% at 3 ug/kg). During the recovery period, the incidences of arrhythmias decreased, again occurring more frequently at higher doses of epinephrine (0% at 1 ug/kg; 11-25% at 2 ug/kg; and 22-38% at 3 ug/kg).This study also looked at the effects of the phenobarbital (an enzyme inducer), SKF-525A (inhibitor of microsomal drug metabolism) and Lilly 18947 (inhibitor of drug metabolism) on arrhythmias during 1,1,1-trichloroethane exposure in the absence/presence of epinephrine. No arrhythmias were seen in the absence of epinephrine. Phenobarbital decreased incidence of arrhythmias, whereas the two inhibitors increased incidences of arrhythmias. This study contains ADME data. Blood levels of 1,1,1-trichloroethane and metabolites were measured.

- ² 5466898: Study 1: OTS0509711-6, 89-880000176, 8EHQ-0588-0535 "Aerotherne TT: An acute vapor inhalation study in Fischer 344 rats with cover letter dated 051688" In an acute inhalation toxicity test, Fischer 344 rats (5/sex/group) were exposed to Aerotherne TT (94.5% 1,1,1-trichloroethane) via whole-body inhalation chambers at target concentrations of 15,000, 18,000, and 22,000 ppm (analytical concentrations: 15,523, 18,425, and 21,053 ppm; nominal concentrations: 14,817, 17,582, and 20,231 ppm) for 4 hours. Animals were observed for 2 weeks following the exposure. Endpoints evaluated included mortality, clinical signs of toxicity, nervous system activity, bodyweights, complete gross pathology examinations, and detailed eye examinations. All animals died during the exposure to 21,053 ppm and 3/5 females died during the exposure to 18,425 ppm. No other mortality occurred. The LC50 for males was between 18,425 ppm and 21,053 ppm and for females was 18,000 ppm (95% CI 16,600-19,400 ppm; equivalent to approximately 99,223 mg/m³ based on a MW of 133.4). During the exposure period, incoordination, lethargy, unresponsiveness to noise, and altered breathing (rapid/shallow and/or labored) were observed in both sexes at all test concentrations. Convulsions were observed in 1 male during the exposure period and lacrimation was observed in both sexes at 15,523 ppm; animals appeared normal by day 1 and throughout the remainder of the observation period. Listlessness was observed in 5 males and 2 females on day 1 at 18,425 ppm; surviving animals appeared normal by day 2 and then throughout the remainder of the observation period. Bodyweights were decreased during the first week of the observation period, but increased during the second week and were greater than the starting bodyweights in surviving animals by the end of the observation period. Upon gross pathological examinations, clear fluid around the external nares, classified as facial soiling, was observed in 4 males at 21053 ppm and 3 females at 18,425 ppm on day 1. Congestion of visceral tissues was observed in all animals at 21,053 ppm and in 3 females at 18,425 ppm on day 1. Uterus distended with clear fluid were observed in 1 female at 15,523 and 18,425 ppm upon sacrifice.
- ³ 5466898: Study 2: OTS0509711-6, 89-880000192, 8EHQ-0688-0535 "An acute inhalation study of aerosolized 1,1,1-trichloroethane in rats with cover letter dated 061688" In an acute inhalation toxicity test, male Fischer 344 rats (5/group) were exposed to one of two solutions of Aerotherne TT for 4 hours using different exposure scenarios for each group. The first solution with Lot No. TA 870402-1 was composed of 94.54% 1,1,1-trichloroethane, 2.54% dimethoxymethane, 2.10% tert-butyl alcohol, and 0.77% butylene oxide. The second solution with Lot No. TA 8611112 was composed of 94.53% 1,1,1-trichloroethane, 2.64% dimethoxymethane, 1.98% tert-butyl alcohol, and 0.74% butylene oxide. The test substances were generated as aerosols, but vapors and aerosols were present in the test chambers. Lot No. TA 870402-1 was used in the first five experiments and TA 8611112 was used in the sixth and seventh experiment. The first group was exposed to a concentration of 16,200 mg/m³ in 157 L chambers with an air flow of 30 L/min at 45 psi. The second group was exposed to a chamber concentration of 17,200 mg/m³ in 157 L chambers with an air flow of 30 L/min at 5 psi. The test substance with air was ducted into the chambers for the first and second groups to form an indirect spray, located approximately 1.5M to the rats. The third group was exposed to a concentration of 17,000 mg/m³ in 157 L chambers with an air flow of 30 L/min at 5 psi. The test substance with air was sprayed directly from the top of the chambers into the chamber, located approximately 0.75 M to the rats. The fourth group was exposed to a concentration of 19,700 mg/m³ in 1,000 L chambers with an air flow of 200 L/min at approximately 5 psi. The test substance with air was sprayed directly from the top of the chambers into the chamber, located approximately 1.2 M to the rats. The fifth and sixth groups were exposed to concentrations of 19,300 and 19,100 mg/m³, respectively, in 1,000L chambers with an air flow of 200 L/min at approximately 5 psi and 20 psi, respectively. The test substance with air was sprayed directly from the top of the chambers into the chamber, located approximately 0.6 and 1.2 M to the rats, respectively. The seventh group was exposed to a concentration of 36,700 mg/m³ in 1,000 L chambers with an air flow of 290 L/min at 20 psi. The test substance with air was sprayed directly from the top of the chambers into the chamber, located approximately 1.2 M to the rats. Animals were observed for 2 weeks following the exposure. Endpoints evaluated included mortality, clinical signs of toxicity, nervous system activity, bodyweights, complete gross pathology examinations, and detailed eye examinations. No mortality was observed in any of the groups. Hypoactivity was observed during the exposure period and a decreased responsiveness to noise was observed towards the end of the exposure period. Uncoordinated gait was observed during the exposure period and immediately following the exposure in animals exposed to 36,700 mg/m³. All rats appeared normal by day 2 and for the remainder of the observation period. Bodyweights were decreased on day 2 in groups one through five, but were increased by the end of the first week in most animals and were greater than starting bodyweights in all animals by the end of the second week. Bodyweights in groups six and seven increased through both weeks of the observation period. A liver hernia was observed in one rat in group two exposed to 17,200 mg/m³. No other gross pathological changes were observed.
- ⁴ 64549: POD was determined by multiplying the ED50 (25 mmol/kg) by the mw of 1,1,1-trichloroethane (mg/mmol): 25 mmol/kg * 133.41 mg/mmol = 3,335 mg/kg. For lethality study, 4-5 groups of male Swiss-Webster mice (10/group) were injected with a single dose of 1,1,1-trichloroethane (doses not reported). The number of deaths were recorded at the end of 24 hours (mice were observed for an additional 10 days). To assess liver and kidney function, liver function was evaluated by measuring serum levels of ALT (SGPT) and sulfobromophthalein (BSP) concentration (30 minutes after intravenous administration); and kidney function was assessed by measuring phenolsulfonephthalein concentration (2 hours after intravenous administration) and urinary protein and glucose levels. Control (oil-treated) mice were used to set baseline parameters of kidney and liver function. Another set of mice, 4-6 groups of mice (10-15/group) were injected i.p. with 1,1,1-trichloroethane (doses not reported except to state organ dysfunction ED50 and LD50 doses were included-determined from previous tests in this study) to study changes to histopathology. Liver and kidney histopathology were evaluated 24 hours after injection. Authors report an LD50 of 37 mmole/kg. ED50 for liver dysfunction was determined to be 25 mmole/kg (based on serum ALT levels). Histologically, enlargement of hepatocytes with cellular infiltration and vacuolation and slight necrosis was seen only in the lethal range. Kidney function and renal histopathology were not different from control. To further study liver dysfunction caused by 1,1,1-trichloroethane, mice were i.p. injected with 2.75 mL/kg and BSP retention and ALT activity were measured. BSP retention was normal (1.9 +/- 0.25 mg/100 mL compared to 2.1 mg/100mL set as the upper limit of normal) and ALT was slightly increased (65 +/- 27 compared to 50 set as the upper limit of normal). Multiple experiments were performed with ethanol (5 g/kg) to determine effects on the liver and kidney. A 45% dextrose solution administered at a volume of 0.02 mL/kg was used as a control. In order to determine any effects of ethanol (5 g/kg) on liver function, mice were pretreated with ethanol (n=20) or dextrose (n=20) for three days. On the fourth day, mice (n=10) were administered an i.p. injection of 2.75 mL/kg 1,1,1-trichloroethane. After 24 h, BSP retention was significantly increased in ethanol (3.76 +/- 0.29 mg/100mL) pretreated versus dextrose (0.91 +/- 0.14 mg/100mL) pretreated mice. A pretreatment with ethanol (n=16, 4.91 +/- 0.69 mg/100 mL) 12 h prior to injection of 2.75 mL/kg 1,1,1-trichloroethane also significantly increased BSP retention compared to control (n=18), but a 2.5 mL/kg dose after 12 h pretreatment with ethanol (n=17) failed to significantly increase ALT (SPGT) levels compared to dextrose (n=19, 3.15 +/- 0.68) pretreated mice. However, for both study groups they were considered increased over control values. However, the dextrose group was considered to be elevated (78 +/- 25 units) compared to the upper limit of normal. In order to determine any effects of ethanol on kidney function, mice were pretreated with ethanol (n=10) or dextrose (n=10) for three days. On the fourth day, mice were administered an i.p. injection of 2.0 mL/kg 1,1,1-trichloroethane. After 24 h, there was no change in phenolsulfonephthalein excretion for ethanol pretreated versus dextrose pretreated mice. A pretreatment with ethanol (n=10) 12 h prior to injection of 2.0 mL/kg 1,1,1-trichloroethane also did not significantly increase phenolsulfonephthalein excretion compared to control (n=10). For all experiments performed to study the effects of ethanol, the percent of phenolsulfonephthalein excreted was considered in the normal range regardless of the experimental design.
- ⁵ 29447: Groups of Princeton albino mice (5-10 males/group) were administered 1,1,1-trichloroethane in peanut oil as a single s.c. injection of 39, 78, 100, and 120 mM/kg (sleeping time experiment) or (lethality experiment). Prior to exposure, the sleeping time of each group was determined following an i.p. injection of sodium pentobarbital; data from all mice were pooled for the determination of a baseline "normal" duration of anesthesia. This pooled untreated control was comprised of data from 270 mice. A group of positive control animals treated with tannic acid, a known liver-damaging agent were also included. Sleeping time was determined 24 hours post-injection. For the lethality experiment, animals were monitored for mortality for 10 days. Sleeping time ED50 and LD50 values were determined. At doses where sleeping time was significantly prolonged, bromsulphthalein (BSP) retention was also measured 24 hrs after administration of the test substance. At necropsy, livers and kidneys were grossly examined and subjected to histopathological analysis. Necropsy times were not explicitly specified nor whether animals from both or one experiment were examined. Mortalities occurred in 1/10, 5/10, and 7/10, animals at 50, 98, and 200 mM/kg, respectively. The LD50 was 120 (95-160) mM/kg (equivalent to ~16,008 mg/kg). Weight loss along with cessation of drinking and eating was reported at the higher doses within 24 hours (unclear if this result is specific to the COI). The mean pentobarbital sleeping time in controls was 1.5 ± 4.1 min. The number of animals showing significantly prolonged sleeping times at 24hrs (compared with controls) was 0/5, 2/9, 8/9, and 10/10, with mean sleeping times of 0, 19, 92, and 83 minutes

at 39, 78, 100, and 120 mM/kg, respectively. Sleeping times prior to 24 hours and at 72 hours were also assessed. EC50 was 84 (72-99) mM/kg (equivalent to ~11,206 mg/kg). All sleeping times greater than 10 minutes were considered to be statistically significant. 0/10 and 7/18 animals showed a significant BSP retention ratio at 78 and 120 mM/kg, respectively. Data on kidney histopathology were not reported. The described liver results were not chemical-specific. Gross examinations showed paling to distinct mosaic lobular mottling at necropsy and/or yellowing and severity increased with dose. Higher (unspecified) dose ranges showed central necrosis of varying degrees of severity with incidences of congestion and fibroid necrosis. Cytoplasmic vacuolation was noted in lower dose groups. There was a correlation between sleeping time and gross and microscopic lesions. Doses in mg/kg were determined for this review using a molecular weight of 133.4 g/mol

Isomer: 1,1,1-Trichloroethane - Short-term (>1-30 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The study does not state what if any compliance methods were followed. Mouse; Swiss albino; Female	intraperitoneal 2 days/week 3 weeks Administered i.p. twice a week (every 4th day) for 3 weeks	POD: 0.1 mg/kg/day (LOAEL, hepatic, developmental) 0, 0.1 mg/kg-bw/day	See footnotes for full summary ¹	Reporting of developmental data is not sufficient for interpretation or to support independent analysis.		Al-Griw et al. 2017 4333726
None specified Mouse; Swiss - [mouse]; Male	Inhalation: Vapor 24 hours/day 4 days Conversion of ppm to mg/m3: 0, 500, 1000, 2000, and 4000 ppm = 0, 2728, 5456, 10,912, and 21,824 mg/m3, based on MW = 133.40 g/mol (formula: mg/m3 = (ppm)(MW/24.45))	POD: 2728 mg/m3 (LOAEL, convulsions) 0, 500, 1000, 2000, 4000 ppm (in air, water, or food)	See footnotes for full summary ²	Test substance purity was not provided, only nominal concentrations were reported, and data were not reported quantitatively for all exposure-related outcomes.		Evans and Balster 1993 5360
Compliance methods, guidelines, or GLP conditions were reported in the study. Mouse; NMRI - [mouse]; Both	Inhalation: Vapor 24 hours/day 7 days/week 30 days	POD: 3400 mg/m3 (LOAEL, liver) (625 ppm) 0, 625 ppm (in air, water, or food)	In a study designed to evaluate butyrylcholinesterase activity, NMRI mice (10/sex) were exposed to the 1,1,1-trichloroethane (metabolite of 1,1,2-trichloroethane) via inhalation at 0 or 625 ppm continuously for 30 days. The liver, kidney, and spleen were weighed at the end of exposure. There was a statistically significant increase in liver weight (p<0.01) and kidney weight (p < 0.05) in female mice; there were no significant effects on liver or kidney weight in male mice. Changes in body weight were not reported. Spleen weight was significantly decreased (p<0.05) by 10% in male mice. Concentration conversion: Administered daily air concentration: 3400 mg/m3; Calculated from the following inputs: Mouse, Unspecified (B6C3F1*), Average of male and female, Subchronic duration, 625 ppm for 7 d/wk 24 hrs/d, MW: 133.4 g/mol; Conversion references: EPA(1988).The study also include mechanistic data for plasma butyrylcholinesterase (BuChE) activity; no significant changes were reported.	The study was designed to test for effects on testosterone levels and BuChE activity following exposure to TCE and other solvents. Only one concentration was tested. There was limited reporting of the methodology, inhalation exposure protocol, and results. The study did not specifically report the route of exposure to be inhalation; however, the exposure unit and exposure method information was described in a previously published study. Measurement of solvent in exposure chambers over the duration of the study was not reported. Data for mean body weight and spleen weights were not reported.	Hepatic/Liver: Medium, Renal/Kidney: Medium, Immune/Hematological: Uninformative, Nutritional/Metabolic: Uninformative	Kjellstrand et al. 1985 62385

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Isomer: 1,1,1-Trichloroethane - Short-term (>1-30 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
Non-guideline study; not GLP compliant Rat; Sprague-Dawley - [rat]; Male	Inhalation: Vapor 24 hours/day 7 days/week 30 days Animals were exposed continuously 24 hrs/day, for a total of 30 days.	POD: 6547 mg/m³ (LOEL, altered brain fatty acid composition; no changes to body weight, liver or brain weight) 0, 1200 ppm (in air, water, or food)	See footnotes for full summary ³	There is uncertainty regarding the accuracy of the exposure concentration and some details regarding exposure methods were lacking. Limited apical endpoints were evaluated.	Neurological/Behavioral, Hepatic/Liver, Nutritional/Metabolic: Medium	Kyrklund and Haglid 1990 631732
The study pre-dates OECD guidelines. The study cites FREE, H. M., and FREE, A. H. (1961). Micro-urinalysis in small animals. Proc. Intern. Congr. Biochem. 5th, Moscow, 1961 p.520. Macmillan (Pergamon), New York. Mouse; Swiss - [mouse]; Male	intraperitoneal 3 days/week 5 days Three times, every other day.	POD: 3300 mg/kg/day (LOAEL, renal) 0, 2.5ml/kg	The density of 1,1,1 trichloroethane is 1.32 g/ml Doses were converted using the formula: density (g/ml) * ml/kg administered = mg/kg. 1320 mg/ml * 2.5 ml/kg = 3300 mg/kg. POD corresponds to a TWA of 1,980 mg/kg/day. Male Swiss mice (5/group) were administered 2.5 ml/kg of 1,1,1 trichloroethane (3300 mg/kg) intraperitoneally every other day for 3 times. 48 hours after last injection, urine was analyzed (via Combistix test strip) and kidney histology was evaluated. Urine analysis was not reported. Swollen proximal tubule were seen in 5/5 mice (>50% of area). Necrosis of the tubules was not observed.	Only one dose tested. Negative control was not run concurrently.		Plaa and Larson 1965 64411

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Isomer: 1,1,1-Trichloroethane - Short-term (>1-30 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The study does not report any compliance methods that were adhered to. Rat; Sprague-Dawley - [rat]; Male	intraperitoneal 1 days/week 1 weeks 1 days Exposure consisted of a single intraperitoneal administration.	POD: 6200 mg/kg (NOAEL, liver, renal) 0, 15mmol/kg	Conversion: Rats are reported to weigh 280-370 grams (average 325g). The mw of 1,1,1-trichloroethane is 133.41 g/mol. Therefore, 133.41 mg/mmol * 15mmol = 2000 mg. 2000 mg/0.325 kg= 6157 mg/kg or 6200 mg/kgMale Sprague-Dawley rats (5-6/group) were administered either corn oil or 15 mmol of 1,1,1-trichloroethane (vehicle not reported) via intraperitoneal injection. Rats were sacrificed 24 hours later. Endpoints evaluated included liver weight, plasma ALT and SDH levels and blood urea levels. No significant difference in relative liver weight was seen. No significant difference in plasma ALT, SDH or urea levels were seen compared to control.This study also contains in vitro data in rat hepatocytes. Authors also studied effects of mixtures of 1,1,1 trichloroethane with trichloroethylene (TRI) and/or tetrachloroethylene (TET) in vivo and in vitro. Combining all three chemicals together significantly increased plasma ALT, SDH and urea levels and reduced relative liver weight significantly more than either chemical alone or in combination. Combining 1,1,1-trichloroethane with TRI increased plasma SDH, but did not effect plasma ALT, urea or relative liver weight compared to 1,1,1-trichloroethane alone. Combining 1,1,1-trichloroethane with TET significantly increased plasma ALT and SDH levels, but did not effect plasma urea or relative liver weight compared to 1,1,1-trichloroethane alone.	The study provides limited observations to assess the liver and kidney toxicity of 1,1,1 trichloroethane at a single high exposure dose. it does not provide dose-response data for 1,1,1 trichloroethane. The aim of the study is to compare the toxic effects of solvent mixtures.	Hepatic/Liver, Renal/Kidney: Medium	Stacey 1989 75357

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Isomer: 1,1,1-Trichloroethane - Short-term (>1-30 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
No guidance reported. Rabbit; Not specified; Unknown	Dermal 10 days	POD: 44 mg/kg/day (LOAEL, skin) 0, 100percentage	The density of 1,1,1-trichloroethane is 1.32 g/cm ³ . Dose conversions: 1.32 g/ml * 0.1ml= 0.132 g or 132 mg. The weights of the rabbits were not reported. Using EPA subchronic reference value (1988) of 2.98 kg, dose was calculated as follows: 132 mg/2.98 kg= 44 mg/kg. Rabbits (sex not specified, n=6) had 0.1 ml of neat 1,1,1-trichloroethane (44 mg/kg/day) gently rubbed into the skin with a cotton-tipped applicator once a day for 10 day (sites were left open). An unexposed control site on the same animal was used for comparison. A separate control group (n=12) was also studied. Each day before application, visual scoring of test site was made for presence of erythema, edema, fissuring and scaling, followed by skin-fold measurements. Skin-fold measurements were made 5 days after treatment ended. An increase in skin-fold thickness was seen one day after treatment (+37%) and remained increased compared to day 0, reaching a maximum of +81% after 10 days. In the separate control group, skin-fold thickness did not change over the time course compared to day 0. Five days after treatment ended skin thickness decreased to +47% over day 0 measurements (Actual measurements not provided). Erythema and edema began to appear one day after treatment and increased further in severity with after 8 days of treatment.	No major limitations. The weights of the rabbits were not reported.		Wahlberg 1984 5469150

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Isomer: 1,1,1-Trichloroethane - Short-term (>1-30 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
No guidance reported. Guinea pig; Not specified; Unknown	Dermal 10 days	POD: 220 mg/kg/day (LOAEL, skin) 0, 100percentage	The density of 1,1,1-trichloroethane is 1.32 g/cm ³ . Dose conversions: 1.32g/ml * 0.1ml= 0.132 g or 132 mg. The weights of the guinea pigs were not reported. For the purpose of this review, we used a weight of 600 grams. The authors state that this is a weight where increasing skin thickness seen in control animals levels off. Assuming guinea pigs weighed about 600 grams, the dose studied was calculated the following way: 132 mg/0.6 kg= 220 mg/kg. Guinea pigs (sex not specified, n=6) had 0.1 ml of neat 1,1,1-trichloroethane (220 mg/kg/day) gently rubbed into the skin with a cotton-tipped applicator once a day for 10 day (sites were left open). An unexposed control site on the same animal was used for comparison. A separate control group (n=22) was also studied. Each day before application, visual scoring of test site was made for presence of erythema, edema, fissuring and scaling, followed by skin-fold measurements. Skin-fold measurements were made 5 days after treatment ended. A small increase in skin-fold thickness was seen one day after treatment (+4%) and continued to increase each day (+17% at day 4), reaching a maximum of +49% after 10 days compared to day 0. In the separate control group, skin-fold thickness was increased +2% at day 10 compared to day 0. Five days after treatment ended skin thickness decreased to (+15%) over day 0 measurements (Actual measurements not provided). Erythema and edema began to appear 2-3 days after treatment and continued to increase in severity with repeated doses.	No major limitations. Weights of guinea pigs not reported.		Wahlberg 1984 5469150

* Overall Quality Determination

¹ 4333726: Three-week-old Swiss albino female mice (8/group) were administered 0 or 0.1 mg/kg/day trichloroethane in corn oil intraperitoneally twice a week (every 4th day) for 3 weeks; a second control group (sham treated) was also included. At 10 weeks of age, female mice were mated until presence of vaginal plug was observed. Dams were allowed to delivery naturally (day of delivery was designated post-natal day [PND] 0). F1 litter size, weights, sex and percentage of dead pups were evaluated. On PND4, litters were culled to 10 pups/litter (5 females and 5 males) if possible. Endpoints evaluated in F0 generation included mortality, body weight, locomotor activity and clinical signs. F0 (all mice) and F1 (2/sex/litter) were sacrificed on PND 120. Liver and body weights were measured. Liver was evaluated for histopathology, cytoarchitecture, number of apoptotic cells, lipid peroxidation levels (determined by TBARS) in F0 and F1 mice, and protein carbonyl and nitric oxide levels in F1 only. No results are reported for mortality, body weight, locomotor activity, clinical signs or liver weights. The study states there were "alterations in sex ratio, but not in litter size, in F1 generation...", however no other details are reported. Significant increases in incidences of liver abnormalities were seen in the F0 (1/8 in control vs 3/8 in treated) and F1 (5/39 in control vs 25/34 in treated) generation. These abnormalities included disturbed parenchyma architecture of the hepatic lobules, infiltration of mononuclear cells around central veins and in portal areas, some dilated congested blood vessels, distortion of hepatocytes accompanied by steatosis and inflammatory infiltrates and complete loss of nucleus. Cytoarchitectural changes observed in treated F0 and F1 generation included: mild pericellular fibrosis, destructed nuclei of hepatocytes, complete loss of hepatocytes, vacuolated cytoplasm, deposition of collagen fibers and remarkable reduction in glycogen storage and carbohydrate content. Significant increases in percentage of apoptotic hepatocytes in the F0 (165%) and F1 (60%) generation and lipid peroxidation in the F0 (5-fold) and F1 (3-fold) generation were seen compared to their respective controls. Significant increases the oxidative stress biomarkers protein carbonyl (80%) and nitric oxide (50%) were seen in the livers of F1 generation livers compared to control. Note- authors do not report if control group data is from sham-treated or vehicle treated group. These data suggest there is a transgenerational effect of TCE exposure.

- ² 5360: Groups of mice (10 males/group) were whole-body exposed to 1,1,1-trichloroethane vapor at a concentration of 0 (air only, control), 500, 1000, 2000, or 4000 ppm continuously for 4 days. Food and water were replenished in the exposure chambers on a daily basis. Test substance concentrations were determined inside the exposure chambers with single wavelength-monitoring infrared spectrometry. Animals were observed for mortality and clinical signs, and body weights were recorded daily. After 4 days, exposure was abruptly discontinued and the animals were placed in standard animal cages. Withdrawal reactions were quantified by scoring for convulsions elicited by handling. Scoring was performed on a scale developed for assessment of ethanol dependence, as follows: 0 = no effect; 1 = tonic convulsions are observed when the animal is lifted and given a 180-degree turn; 2 tonic convulsions are observed when the animal is only lifted and not turned, or a tonic-clonic convulsions are observed when the animal is lifted and turned; 3 = tonic-clonic convulsions are observed when the animal is only lifted; and 4 = severe tonic-clonic convulsions are observed and continue after release of the animal. Post-exposure convulsions were assessed hourly for 12 hours, with additional assessments conducted at approximately 12- to 24-hour intervals thereafter until recovery occurred. No mortalities were reported. All animals exposed to 4000 ppm were sedated and fur coats became dull, and irritation of the eyes was evident in some animals in this group. Body weight loss (>25%) occurred during exposure in the 4000 ppm group animals, with body weights recovering to pre-exposure levels by approximately 3 days post-exposure. Handling-induced convulsions were observed in all test substance-exposed groups (500-4000 ppm). The frequency and intensity of handling-induced convulsions were concentration dependent. At peak withdrawal (2-4 hours post-exposure), approximately 90% of mice in the 4000 ppm exposure group, and 80% of mice in the 2000 ppm exposure group were affected, whereas the percentage did not exceed 50% in the 500 ppm exposure group. The LOAEL was 500 ppm (2728 mg/m³, determined by the reviewer) based on neurological effects (convulsions) at the lowest concentration tested.
- ³ 631732: Male Sprague-Dawley rats (8/group) were exposed, whole body, to 1,1,1-trichloroethane (target?) vapor concentrations of 0, and 1200 ppm continuously for 30 days. It was reported in the text that measured exposures were 1,160 ppm on the first day of exposure and 1,280 ppm on the last day of exposure. The study indicated that daily variation in exposure concentrations were not detected; however, there was a "constant drift." The study reported that body weight was unchanged by exposure, and there was a slight, but significant increase in absolute (9%), but not relative, liver weight, and no change in whole brain weight. Weights of dissected cerebral cortices were significantly decreased. The lipid class composition in the cerebral cortex was unchanged; however, there were some changes to the fatty acid pattern including significant decreases in 18:0 and 20:4 and increases in 20:3 and 22:5. Toxicity values were not reported by the study author. A NOAEL of 1200 ppm (6,547 mg/m³) for above organ apical endpoints (e.g., body weights, brain and liver weights) was determined for this review, based on the lack of biologically significant changes in these endpoints. A LOEL of 1200 ppm (6,547 mg/m³) was determined based on changes to the fatty acid patterns in the brain. It is unclear whether these changes are adverse. The concentration in PPM was converted to mg/m³ for this review using the following formula: mg/m³ = (ppm x MW)/24.45 where the molecular weight is 133.41. Additional experiments included continuous exposure to 0, 280, or 1200 ppm for 24 hours, or to 0 and 280 ppm continuously for 5 days. The shorter duration experiments did not measure apical (above organ) endpoints, and only measured concentrations of the test substance in blood (ADME); therefore, these experiments were not evaluated separately.

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1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Subchronic (>30-91 days)

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Isomer: 1,1,1-Trichloroethane - Subchronic (>30-91 days)					
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD* Citation and HERO ID

Isomer: 1,1,1-Trichloroethane - Subchronic (>30-91 days)					
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD* Citation and HERO ID

”The animal studies of 1,1,1-trichloroethane were performed in compliance with United States Food and Drug Administration Good Laboratory Practices regulations (21 CFR, Part 58). The Quality Assurance Unit of TSI Mason Research Institute performed audits and inspections of protocols, procedures, data, and reports throughout the course of the studies.” ”The studies described in this Toxicity Study Report were performed under the direction of the NIEHS and were conducted in compliance with NTP laboratory health and safety requirements and must meet or exceed all applicable federal, state, and local health and safety regulations. Animal care and use were in accordance with the Public Health Service Policy on Humane Care and Use of Animals.” ”Methods	Oral: Diet 13 weeks Mice were fed diets containing 0, 5000, 10000, 20000, 40000 or 80000 ppm microencapsulated 1,1,1-trichloroethane for 13 weeks. Based on food intake, study authors calculate the doses as:Males: 0, 850, 1770, 3500, 7370 or 15000 mg/kg/dayFemales: 0, 1340, 2820, 5600, 11125, or 23000 mg/kg/day	POD: 1770 mg/kg/day (NOAEL, body weight) 0, 850, 1770, 3500, 7370, 15000 mg/kg-bw/day	See footnotes for full summary ¹	None identified although study reports dosage based on feed consumption, and states: ” feed consumption values and exposure concentrations were determined by the disappearance of feed from the feeder and may not accurately represent intake”.	NTP 2000 5469437

1,1,2-Trichloroethane

Human Health Hazard Animal Toxicology Extraction

Subchronic (>30-91 days)

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Isomer: 1,1,1-Trichloroethane - Subchronic (>30-91 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
"The animal studies of 1,1,1-trichloroethane were performed in compliance with United States Food and Drug Administration Good Laboratory Practices regulations (21 CFR, Part 58). The Quality Assurance Unit of TSI Mason Research Institute performed audits and inspections of protocols, procedures, data, and reports throughout the course of the studies." "The studies described in this Toxicity Study Report were performed under the direction of the NIEHS and were conducted in compliance with NTP laboratory health and safety requirements and must meet or exceed all applicable federal, state, and local health and safety regulations. Animal care and use were in accordance with the Public Health Service Policy on Humane Care and Use of Animals". "Methods were those outlined in the National Toxicology Program's Technical Protocol for Sperm Morphology and Vaginal	Oral: Diet 13 weeks Rats were fed diets containing 0, 5000, 10000, 20000, 40000 or 80000 ppm microencapsulated 1,1,1-trichloroethane for 13 weeks. Based on food intake, study authors calculate the doses as:Males: 0, 300, 600, 1200, 2400 or 4800 mg/kg/dayFemales: 0, 300, 650, 1250, 2500 or 5000 mg/kg/day	POD: 600 mg/kg/day (NOAEL, kidney) 0, 300, 600, 1200, 2400, 4800 mg/kg-bw/day	See footnotes for full summary ²	None identified although study reports dosage based on feed consumption, and states: " feed consumption values and exposure concentrations were determined by the disappearance of feed from the feeder and may not accurately represent intake".		NTP 2000 5469437

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Isomer: 1,1,1-Trichloroethane - Subchronic (>30-91 days)						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
None Rat; Osborne-Mendel - [rat]; Male	Oral: Gavage 5 days/week 7 weeks Promotion protocol	POD: No evidence of tumor promotion was observed at 2000 mg/kg/day 0, 2000 mg/kg-bw/day	Rats that had been subjected to partial hepatectomies were administered a single tumor initiating dose of diethylnitrosamine (or water) via i.p. injection. Six days later, animals began receiving 1,1,1-TCE at 2000 mg/kg/day for 5 days/week for 7 weeks (administered at 2/3 the MTD). One week later, the experiment was terminated and livers were examined histopathologically for GGT-positive foci. The incidence of foci was not increased in animals that received 1,1,1-TCE with or without diethylnitrosamine. Body weight gains were reduced in animals administered 1,1,1-TCE in conjunction with diethylnitrosamine. Liver weights were not affected.	The primary purpose of this study was to evaluate the tumor initiation and promotion potential of the chemical. Effects on body and liver weights were not the primary purpose of the study, and only minimal details are provided for these endpoints. The absence of effects on liver weights is implied but not explicitly stated.	Cancer/Carcinogenesis: High	Milman et al. 1988 200479

* Overall Quality Determination

¹ 5469437: A NOAEL of 10,000 ppm was reported by study authors for male and female mice. Six-to seven-week old B6C3F1 (10/sex/group) were fed diets containing 0, 5000, 10000, 20000, 40000 or 80000 ppm microencapsulated 1,1,1-trichloroethane for 13 weeks. Based on food consumption, study authors estimate daily dose as the following: males: 0, 850, 1770, 3500, 7370, or 1500 mg/kg/day; females: 0, 1340, 2820, 5600, 11125, or 23000 mg/kg/day. A second control group (10/sex) were given feed that did not contain microcapsules (untreated controls). Animals were observed twice a day, and clinical findings were recorded weekly. Endpoints evaluated included mortality, body weight (weekly), food intake (twice a week), gross necropsy, organ weight (heart, right kidney, liver, lungs, right testis and thymus), complete histopathologic examination on 30 tissues (from untreated, vehicle control and high dose group) and gross lesions or tissue masses, sperm motility and vaginal cytology (for 12 days prior to sacrifice). All mice survived the entirety of the study. No clinical signs of toxicity were seen. Body weight changes were significantly decreased in all dose males (18-22%) and females at ≥ 2820 mg/kg/day (22-44%) resulting in significantly decreased terminal body weights in males (9, 9, 11, 10 and 15%) at 850, 1770, 3500, 7370, and 1500 mg/kg/day, respectively, and females (11, 12 and 16%) at 5600, 11125, and 23000 mg/kg/day, respectively compared to vehicle control. Food intake was dose-relatedly increased in males (up to 20%) and females (up to 10%) compared to vehicle control, therefore the loss in body weight was not attributed to decreased food intake. In males, significant decreases in absolute kidney (7, 6, 7, 6, and 11%) at 850, 1770, 3500, 7370, and 1500 mg/kg/day, respectively, absolute liver weight (11%) at 1500 mg/kg/day, absolute heart weight (14, 10, 13, 18 and 23%) at 850, 1770, 3500, 7370, and 1500 mg/kg/day and relative heart weight (11 and 10%) at 7370, and 1500 mg/kg/day, respectively compared to vehicle control. In females, absolute kidney weight was significantly decreased (7, 10 and 9%) at 5600, 11125, and 23000 mg/kg/day, respectively compared to vehicle control. The changes in organ weights are considered by study authors to be secondary to body weight changes and not considered biologically significant. No gross or microscopic compound-related lesion were seen in either sex. No difference in spermatid measurements or motility were seen. Epididymal spermatozoal concentration was significantly decreased (20%) at 1500 mg/kg/day compared to vehicle control. No significant difference in estrous cycle length or stages were seen compared to vehicle control.

² 5469437: A NOAEL of 10,000 ppm was reported by study authors for male and female rats. Six-week old F344/N rats (10/sex/group) were fed diets containing 0, 5000, 10000, 20000, 40000 or 80000 ppm microencapsulated 1,1,1-trichloroethane for 13 weeks. Based on food consumption, study authors estimate daily dose as the following: males: 0, 300, 600, 1200, 2400 or 4800 mg/kg/day; females: 0, 300, 650, 1250, 2500 or 5000 mg/kg/day. A second control group (10/sex) were given feed that did not contain microcapsules (untreated controls). Animals were observed twice a day, and clinical findings were recorded weekly. Endpoints evaluated included mortality, body weight (weekly), food intake (twice a week), hematology, blood chemistry (serum ALT, ALP, SDH, creatine kinase and bile acids), gross necropsy, organ weight (heart, right kidney, liver, lungs, right testis and thymus), complete histopathologic examination on 30 tissues (from untreated, vehicle control and high dose group; kidney histology from all groups), sperm motility and vaginal cytology (for 12 days prior to sacrifice). A satellite group of animals (10/sex/group) were exposed to the same concentration as above and used for blood collection on days 3 and 23 (for hematology and clinical chemistry parameters). Urine was collected (via 24 hour placement in metabolism cages) from 5 males in the satellite group from the 0, 300, 1200 and 4800 mg/kg/day groups on days 28 and 84 (urine volume, urine creatinine, trichloroacetic acid and free and total trichloroethanol). All rats survived the entirety of the study. No clinical signs of toxicity were noted. Although slight significant changes in body weight were seen, terminal body weights in dose groups were within 10% of both untreated control and vehicle control groups in both sexes. No difference in food consumption was seen compared to control groups. Minimal erythrocytosis was seen at ≥ 600 mg/kg/day in males and ≥ 1250 mg/kg/day in female as indicated by slight, yet significant increases in hematocrit, hemoglobin concentration and erythrocyte counts (3-10%). Serum ALP were minimally decreased (8%) in males at 4800 mg/kg/day, and in females (7-9%) at ≥ 2500 mg/kg/day on day 23 and 15% in females at 5000 mg/kg/day at week 13. These hematological and clinical chemistry changes were sporadic and inconsistent between males and females and considered by study authors to be non-compound related and not biologically significant. Urinary volume and creatinine were not different from control. Urinary metabolites (trichloroacetic acid, free trichloroethanol and/or total trichloroethanol) were significantly increased in dosed males compared to vehicle control. Significantly decreased absolute liver weights (13%) in males at 4800 mg/kg/day and absolute and relative liver weight (17% and 12%, respectively) in females at 5000 mg/kg/day were seen compared to vehicle control. Other significant changes in organ weights seen, but not considered by study authors to be compound-related, included decreased absolute right kidney weight (9%) in females at 5000 mg/kg/day; decreased absolute heart weight (8% and 11%) in males at 2400 and 4800 mg/kg/day, respectively; and increased relative testis weight (8% and 9%) at 2400 and 4800 mg/kg/day, respectively. In male kidneys, significant increased incidences of chronic inflammation (minimal to mild) (7/10, 10/10, and 10/10) were seen at 1200, 2400 and 4800 mg/kg/day, respectively. Significant increased incidence of renal tubule casts (5/10 and 10/10) occurred at 2400 and 4800 mg/kg/day, respectively. Renal tubule hyaline degeneration was observed in all males at ≥ 1200 mg/kg/day, increasing in severity from minimal to mild. These lesions are consistent with hyaline droplet nephropathy, and not observed in the control groups. No gross or microscopic compound-related lesions were seen in females. No other compound-related lesion were seen in males. No difference in spermatid measurements or motility were seen. Epididymal spermatozoal concentration was significantly decreased (10%) at 4800 mg/kg/day compared to vehicle control. No significant difference in estrous cycle length or stages were seen compared to vehicle control.

Isomer: 1,1,1-Trichloroethane - Reproductive/Developmental

Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
The study does not report any compliance methods or guidelines adhered to. Rat; Sprague-Dawley - [rat]; Female	Inhalation: Vapor 3 hours/day 7 days Females were exposed for one hour, three times a day (with a one-hour recovery period between each exposure) from GD 13-19.	POD: 38,000 mg/m3 (LOAEL, developmental, clinical signs) 7000 ppm 0, 7000 ppm (in air, water, or food) F0 - gestation, GD13-19	See footnotes for full summary ¹	The source, and purity of the test substance were not reported. Test substance is a respiratory irritant and therefore respiratory rate should be reported. Authors did not measure/report respiration rate.	Reproductive/Developmental, Nutritional/Metabolic, Clinical signs: Medium	Coleman et al. 1999 196341
No guideline reported Mouse; ICR - [mouse]; Both	Oral: Drinking water 25 weeks Male and females ICR mice (FO) were exposed for 5 weeks prior to mating and throughout the lactation. Exposed F0 generation was mated 3 times to generate F1/A, F1/B and F1/C (resting 2 weeks in between litters). Exposure was continuous for 25 weeks. F1 males and females were exposed after weaning for 11 week prior to mating and then throughout mating, gestation and lactation. The F1 were mated twice to generate F2/A and F2/B generation (resting 2 weeks in between litters). Exposure was continuous for 24 weeks.	POD: 1000 mg/kg/day (NOAEL, reproductive/developmental) 0, 100, 300, 1000 mg/kg-bw/day F0- pre-mating, 5 week, F0- mating, during, F0 - gestation, 3 weeks, F0- lactation, 3 weeks, F0- post-natal, 2 weeks, F1- pre-mating, 11 weeks, F1- mating, during, F1 - gestation, 3 weeks, F1- lactation, 3 weeks, F1- post-natal, 2 weeks	In a multi-generation reproduction study, male (n=10/group) and female (n=30/group) ICR Swiss mice were provided drinking water containing 0, 0.58, 1.75 or 5.83 mg/ml 1,1,1-trichloroethane for 5 weeks prior to mating and throughout pregnancy and lactation. Authors report concentrations of test substance yielded daily doses of 0, 100, 300 or 1000 mg/kg/day 1,1,1-trichloroethane. Control groups included water only and water containing 1% Emulphor. Exposed mice were mated (1 male:3 females) for 7 days to generate F1 litter. The F0 generation was mated 3 times to generate F1/A, F1/B and F1/C groups. F1/B males (10/group) and females (30/group) were exposed after weaning for 11 weeks and then mated. Exposure continued throughout mating, gestation and lactation. The F1/B were mated twice to generate F2/A and F2/B generations. Exposure was continuous for 25 weeks (F0) or 24 weeks (F1/B). Endpoints evaluated included adult mortality (F0 and F1/B), body weight, fluid consumption and reproductive and developmental parameters. No exposure-related differences in mortality, body weight or fluid intake were observed. No dose-related effects on reproduction endpoints in the F0 and F1 generation (fertility, gestation, pup viability, lactation indices, pup size at birth or sex ratio) or developmental endpoints in F1 and F2 generation (pup survival, pup weight gain, gross pathology or congenital malformations) were seen.	The "dominant lethal" portion of the study had important limitations. The OECD guideline 478 for rodent dominant lethal tests recommends including enough dams to produce at least 400 implants, while this study produced under 200 implants in some groups. In addition, negative control animals in this assay had a very low fertility index. The fertility index in controls was 58.3 and 56.7 while the fertility index reported in historical control ICR mice ranges from 80-100 (https://www.crj.co.jp/cms/crj/pdf/product/rm/information/icr/CRL_Reproductive_behavioral_e). This suggests the potential for unidentified sources of confounding and making it difficult to interpret results from treated animals. In other portions of the study, the fertility rates in controls range from 73 to 90, a range that is also lower than historical controls, though less dramatic of a deviation than in the dominant lethal assay.		Lane et al. 1982 62609

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Isomer: 1,1,1-Trichloroethane - Reproductive/Developmental						
Guideline and Animal Species, Strain, Sex	Exposure Route and Exposure Duration	Study-wide POD and Dose/Concentration(s)	Summary	Major Limitations	Principal Target Organs/Systems and OQD*	Citation and HERO ID
"The study was performed in compliance with Environmental Protection Agency good laboratory practices regulations (EPA, 1983)." Rabbit; New Zealand White - [rabbit]; Female	Inhalation: Vapor 6 hours/day 7 days/week 13 days Exposure occurred from gestational day 6-18.	POD: 5,549 mg/m3 (NOEL maternal body weight gain); 1000 ppm 0, 1017, 3122, 5906 ppm (in air, water, or food) F1 - gestation, GD6-18	See footnotes for full summary ²	Assessment of maternal thyroid gland was not conducted. It is not clear if reproductive tract in fetuses was examined for signs of altered development, internal cardiac structure in fetuses was not examined.		Bushy Run Research Center, 1987 5467064

* Overall Quality Determination

¹ 196341: The following formula was used to convert ppm to mg/m3: (ppm * mw) / 24.45 = mg/m3 (7000 ppm * 133.41 g/mol) / 24.45 = 38,195 mg/m3 or 38,000 mg/m3. 70 day old nulliparous female Sprague-Dawley CD rats were bred with males until the presence of a seminal plug was found (GD 0). Presumed pregnant dams (9-10/group) were exposed to filtered air or 7000 ppm 1,1,1-trichloroethane for one hour, three times a day (with a one hour recovery period between exposures) from GD 13-19. Within 5 minutes of removal from exposure chamber dams were observed and the following behaviors were scored: response to handling, salivation, lacrimation, piloerection, behavior on a smooth horizontal surface (gait abnormalities, ability to locomote, clonic movements, tonic movements). Body weight and food and water intake were monitored daily. Dams were allowed to deliver naturally and pups were placed with foster dams. Endpoints evaluated included: number of litters, gestation length, number of live pups, number of dead or deformed offspring, sex ratio, resorptions, litter weight, pup weight. One male and one female pup were examined each day and assessed for behavior (righting reflex, behavioral tests [negative geotaxis, inverted screen test], muscle strength [vertical screen test, forelimb grip strength], and physical development and motor activity (days eyes opened, pinnae detached, and incisors erupted; spontaneous motor activity [total and ambulatory], rearing activity). Brain weight of the pups (1/sex/litter) was recorded at sacrifice on PND 22. Maternal weight gain from GD 0-21 was not different from control, although during treatment (GD 13-19) maternal weight gain was significantly decreased 53% compared to control. Food and water consumption were not different between the groups, although there was a trend for compound exposed dams to eat less (data not shown). Following exposure, compound exposed dams had slight to severe salivation and lacrimation that increased with increasing days of exposure, and changes in their gait (ataxia, body dragging, splaying of hindlimbs) for approximately 10 minutes after the exposure period. No effects on piloerection, or clonic or tonic movements were seen. No clinical signs were seen in control rats. Two compound exposed dams completely resorbed their offspring; all control dams delivered a litter. Gestation length in compound exposed rats was significantly longer (approximately 1 day) than in controls. Excluding the 2 dams that completely resorbed their litters, the number of live pups/litter was significantly decreased (32%) and the number of resorptions/litter was significantly increased (1.1 in control vs 5.4 in exposed) compared to control. If all 9 exposed dams are included, the number of resorption/litter is 7.2 (compared to 1.1 in control). No difference was seen in pup sex ratio. The mortality index [(number of stillbirths + number of resorptions) / number of implantation sites] was significantly increased in exposed rats compared to control (0.48 and 0.06, respectively). Litter weight was significantly decreased (41%) compared to control, however this is a reflection of the decreased number of pups born in the exposed group, since there was no significant difference in the average pup weights between the groups at birth. Pup weight gain from PND 2 to PND 14 was significantly decreased (13%) compared to control (estimated from graphically presented data). However, total pup weight gain from PND 2-21 was not significantly different from control. No differences in physical development were seen (righting reflex, incisor eruption, pinnae development or eye opening) between the groups. Compound exposed pups were slower to control the orientation of their bodies as assessed by a significant increase in the number of days to reach criterion and mean latency (PND 7-20) in the inverted screen and negative geotaxis tests. Significant decreases in forelimb grip strength from PND 9-20 (57%) and mean duration pups can hold on in vertical screen test (32%) compared to control (estimated from graphically presented data). On PND 21, significant decreases in total locomotor activity (47%) and ambulatory (horizontal) activity (60%) were seen compared to control (estimated from graphically presented data); no change in rearing activity was seen. Significant decrease in pup terminal body weight on PND 22 (13%), absolute brain weight (31%), relative brain weight (21%) and absolute cerebellar weight (25%) compared to control.

² 5467064: Concentration conversion: 1,1,1-trichloroethane has a mw of 133.4 g/mol. Using the formula (ppm * mw)/24.45 = mg/m3, concentration of 1017 ppm = 5,549 mg/m3; 3122 ppm= 17,034 mg/m3; 5906 ppm= 32,223 mg/m3. Study authors report NOEL of 1000 ppm for maternal toxicity and a NOEL of 3000 ppm for developmental. Five and a half to six month old virgin female New Zealand white rabbits were bred with males until copulation (gestational day [GD] 0). Presumed pregnant females (24/group) were exposed to 0, 1017, 3122 or 5906 ppm of 1,1,1-trichloroethane via inhalation 6 hours/day, from GD 6-18. Rabbits were observed daily for mortality and clinical signs; maternal body weights were taken on GD 0, 6, 9, 12, 15, 19 and 29. Rabbits were sacrificed on GD29. Endpoints evaluated included gross necropsy, gravid uterine and liver weights, number of corpora lutea and uterine implantation sites, resorptions, and dead and live fetuses. All live fetuses were weighted, sexed, examined for external malformations and variations (including cleft palate), and visceral malformations and variations. 50% of fetuses in each litter were decapitated and had their head examined for craniofacial alteration, the other 50% were examined for skeletal malformation and variations. No exposure related deaths occurred in the does. No significant treatment-related clinical signs were observed. No statistically significant differences in the periodic body weights were seen compared to control, however body weight gains were significantly decreased during the following timepoints: GD 6-9 (3.2-fold and 2.7-fold), GD 6-19 (1.6-fold and 1.6-fold), and GD 0-29 (32% and 34%) at 3122 and 5906 ppm, respectively. Terminal body weights (absolute and corrected for gravid uterine weight), and liver weights were not significantly different from control. No significant differences in number of corpora lutea, total resorptions, dead fetuses, viable implantations, pre- or post-implantation loss, sex ratio or fetal body weights per litter were seen. At 5906 ppm, the number of corpora lutea per doe were slightly reduced (non-significantly), therefore total implants and viable implants per litter were significantly reduced, with no change in preimplantation loss or non-viable implants per litter compared to control. No significant differences in incidences of any individual malformation, of malformations by category (external, visceral or skeletal) or total malformation were seen. Out of 51 skeletal variation observed, incidences of one variation, extra thirteenth rib was significantly increased at 5906 ppm (data not shown).

Epidemiology Extraction Table: Cancer/Carcinogenesis

Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
All cancer mortality; trachea, bronchus, and lung cancer mortality; lymphatic and hematopoietic cancer mortality; brain and nervous system cancer mortality Study Design: Cohort (Retrospective) Health Effect: Cancer/Carcinogenesis	occupational male & female 4,396 United Autoworkers members ever employed at automotive electronics manufacturing plants, Huntsville, AL, 1972 to 1993	1,1,1-trichloroethane (no other information provided)	No significant results for cause-specific mortality by duration of work.	Medium	nan 5452779
renal cell carcinoma Study Design: Case-Control Health Effect: Cancer/Carcinogenesis	occupational male & female A group of 438 cases (273 men and 165 women) were selected from the Minnesota Cancer Surveillance System, Minnesota, US, 1988-1990	The prevalence of exposure to 1,1,2-trichloroethane in men was 7% and 8% in cases and controls, respectively, in women was 2% in both cases and controls, and 5% and 6% in cases and controls, respectively, in all participants. Exposure estimates for each group were not provided.	No significant increase in the risk of renal cell carcinoma was observed with exposure to 1,1,2-trichloroethane among men (OR 0.90, 95% CI 0.5-1.6) or women (OR 0.95, 95% CI 0.2-4.4) separately, or for all participants exposed (OR 0.91, 95% CI 0.5-1.6).	Medium	Dosemeci et al. 1999 4697224
renal cell carcinoma Study Design: Case-Control Health Effect: Cancer/Carcinogenesis	occupational male & female A group of 438 cases (273 men and 165 women) were selected from the Minnesota Cancer Surveillance System, Minnesota, US, 1988-1990	The prevalence of exposure to methyl chloroform in men was 19% and 21% in cases and controls, respectively, in women was 8% and 7% in cases and controls, respectively, and 15% and 17% in cases and controls, respectively, in all participants. Exposure estimates for each group were not provided.	No significant increase in the risk of renal cell carcinoma was observed with exposure to methyl chloroform among men (OR 0.88, 95% CI 0.6-1.3) or women (OR 1.26, 95% CI 0.6-2.8) separately, or for all participants exposed (OR 0.94, 95% CI 0.7-1.3).	Medium	Dosemeci et al. 1999 4697224
SMR: Mortality due to cancer (all types) Study Design: Cohort (Retrospective) Health Effect: Cancer/Carcinogenesis	occupational male & female 14,067 aircraft manufacturing employees who worked at least 4 years between 1958 and 1982, San Diego County	1,1,1-trichloroethane, occupational (not quantified)	No significant excess in mortality.	High	Garabrant et al. 1988 702055

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Epidemiology Extraction Table: Cancer/Carcinogenesis					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
SMR: Mortality due to MN of buccal cavity, pharynx, lip, tongue, respiratory system Study Design: Cohort (Retrospective) Health Effect: Cancer/Carcinogenesis	occupational male & female 14,067 aircraft manufacturing employees who worked at least 4 years between 1958 and 1982, San Diego County	1,1,1-trichloroethane, occupational (not quantified)	No significant excess in mortality.	High	Garabrant et al. 1988 702055
SMR: Mortality due to MN of digestive organs and peritoneum (esophagus, stomach, intestine, rectum) Study Design: Cohort (Retrospective) Health Effect: Cancer/Carcinogenesis	occupational male & female 14,067 aircraft manufacturing employees who worked at least 4 years between 1958 and 1982, San Diego County	1,1,1-trichloroethane, occupational (not quantified)	No significant excess in mortality.	High	Garabrant et al. 1988 702055
SMR: Mortality due to MN of breast, female and male genital organs, prostate, other male genital organs Study Design: Cohort (Retrospective) Health Effect: Cancer/Carcinogenesis	occupational male & female 14,067 aircraft manufacturing employees who worked at least 4 years between 1958 and 1982, San Diego County	1,1,1-trichloroethane, occupational (not quantified)	No significant excess in mortality.	High	Garabrant et al. 1988 702055
SMR: Mortality due to MN of kidney, bladder and urinary organs Study Design: Cohort (Retrospective) Health Effect: Cancer/Carcinogenesis	occupational male & female 14,067 aircraft manufacturing employees who worked at least 4 years between 1958 and 1982, San Diego County	1,1,1-trichloroethane, occupational (not quantified)	No significant excess in mortality.	High	Garabrant et al. 1988 702055
SMR: Mortality due to MN of biliary passages and liver Study Design: Cohort (Retrospective) Health Effect: Cancer/Carcinogenesis	occupational male & female 14,067 aircraft manufacturing employees who worked at least 4 years between 1958 and 1982, San Diego County	1,1,1-trichloroethane, occupational (not quantified)	No significant excess in mortality.	High	Garabrant et al. 1988 702055
SMR: Mortality due to MN of brain and nervous system Study Design: Cohort (Retrospective) Health Effect: Cancer/Carcinogenesis	occupational male & female 14,067 aircraft manufacturing employees who worked at least 4 years between 1958 and 1982, San Diego County	1,1,1-trichloroethane, occupational (not quantified)	No significant excess in mortality.	High	Garabrant et al. 1988 702055

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Epidemiology Extraction Table: Cancer/Carcinogenesis					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
SMR: Mortality due to neoplasms of lymphatic, and hematopoietic origin (lymphosarcoma, Hodgkin's disease, leukemia and aleukemia, and other neoplasms) Study Design: Cohort (Retrospective) Health Effect: Cancer/Carcinogenesis	occupational male & female 14,067 aircraft manufacturing employees who worked at least 4 years between 1958 and 1982, San Diego County	1,1,1-trichloroethane, occupational (not quantified)	No significant excess in mortality.	High	Garabrant et al. 1988 702055
Pancreatic cancer mortality Study Design: Case-Control Health Effect: Cancer/Carcinogenesis	occupational male & female Decedents from 24 states (63,097 cases; 252,386 controls)	1,1,2-Trichloroethane estimated from listed occupation/industry and application of job matrix (exposure by position).	No statistically significant associations between exposure and pancreatic cancer.	High	Kernan et al. 1999 194820
Colon cancer (Y/N) Study Design: Case-Control Health Effect: Cancer/Carcinogenesis	adults male & female 347 individuals with diagnoses of colon cancer in the Wisconsin Cancer Reporting System, 639 individuals from the Wisconsin Cancer Reporting System with diagnoses of cancer outside of the gastrointestinal and urinary systems, and 611 healthy individuals from Wisconsin, all ranging from 50-89 years of age.	1,1,1-Trichloroethane in municipal groundwater supply across 4 time points (1951, 1961, 1971, 1981), (micrograms/L), no central tendency; estimated via model	Colon cancer cases positively associated with ≥ 2 micrograms/L of 1,1,1-Trichloroethane exposure when compared to general population controls (1951, 1971. Positive association with < 10 micrograms/L of 1,1,1-Trichloroethane exposure when compared to general population controls in 1951 and when compared with cancer controls for 1951 and 1971. Significant associations were not otherwise found. Comments: Exposure measure model included participant residential history, water consumption habits, and ppb for 1,1,1-Trichloroethane measured in 1984-1986.	Medium	Young et al. 1990 1069372

Epidemiology Extraction Table: Cardiovascular

Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Chest pains, irregular heartbeat Study Design: Cross-Sectional Health Effect: Cardiovascular	adults male & female Barrett Station (1989-1990), United States, 672 Black adults living near Superfund sites	1,1,2-trichloroethane, exposure level central tendency not re- ported	Excess prevalence of chest pains in high exposure group (top 10% of exposure distribution) vs. low exposure group (bottom 30% of exposure distribu- tion): 32.45% (p <0.05) Excess prevalence of ir- regular heartbeats in high exposure group (top 10% of exposure distribution) vs. low exposure group (bottom 30% of exposure distribution): 48.37% (p <0.05) Comments: "Excess prevalence" outcome de- fined as [(high exposure prevalence - low exposure prevalence)/low exposure prevalence] * 100. Expo- sure measured via "cumulative exposure" defined as the sum of residential distance to 2 Superfund sites * number of months in residence, summed over 28 years, and then categorized into high ex- posure (top 10% of distribution of cumulative exposure scores) vs. low exposure (bottom 30% of distribution of cumulative exposure scores).	Uninformative	Dayal et al. 1995 200292
Cardiovascular disease mortality Study Design: Cohort (Retrospec- tive) Health Effect: Cardiovascular	occupational male & female 4,396 United Autoworkers members ever employed at automotive electronics man- ufacturing plants, Huntsville, AL, 1972 to 1993	1,1,1-trichloroethane (no other information provided)	No significant results for cause-specific mortality by duration of work.	Medium	nan 5452779
palpitations Study Design: Cross-Sectional Health Effect: Cardiovascular	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of palpitations was significantly higher among exposed subjects (4.1) than for unexposed (2.1) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
burning in chest Study Design: Cross-Sectional Health Effect: Cardiovascular	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of burning in chest was significantly higher among exposed subjects (4.4) than for unex- posed (2.1) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576

Epidemiology Extraction Table: Endocrine					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Pancreatic cancer mortality Study Design: Case-Control Health Effect: Endocrine	occupational male & female Decedents from 24 states (63,097 cases; 252,386 con- trols)	1,1,2-Trichloroethane estimated from listed occupation/industry and applied job matrix.	No statistically significant association between exposure and pancreatic cancer.	High	Kernan et al. 1999 194820

Epidemiology Extraction Table: Gastrointestinal

Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Diarrhea/stomach cramps, gastritis, nausea/vomiting Study Design: Cross-Sectional Health Effect: Gastrointestinal	adults male & female Barrett Station (1989-1990), United States, 672 Black adults living near Superfund sites	1,1,2-trichloroethane, exposure level central tendency not re- ported	No statistically significant associations. Comments: "Excess prevalence" outcome de- fined as [(high exposure prevalence - low exposure prevalence)/low exposure prevalence] * 100. Expo- sure measured via "cumulative exposure" defined as the sum of residential distance to 2 Superfund sites * number of months in residence, summed over 28 years, and then categorized into high ex- posure (top 10% of distribution of cumulative exposure scores) vs. low exposure (bottom 30% of distribution of cumulative exposure scores).	Uninformative	Dayal et al. 1995 200292
Digestive system diseases mortal- ity Study Design: Cohort (Retrospec- tive) Health Effect: Gastrointestinal	occupational male & female 4,396 United Autoworkers members ever employed at automotive electronics man- ufacturing plants, Huntsville, AL, 1972 to 1993	1,1,1-trichloroethane (no other information provided)	No significant results for cause-specific mortality by duration of work.	Medium	nan 5452779
nausea Study Design: Cross-Sectional Health Effect: Gastrointestinal	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of nausea was significantly higher among exposed subjects (4.6) than for unexposed (2.3) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
indigestion Study Design: Cross-Sectional Health Effect: Gastrointestinal	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of indigestion was significantly higher among exposed subjects (6.2) than for unexposed (3.4) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
loss of appetite Study Design: Cross-Sectional Health Effect: Gastrointestinal	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of loss of appetite was significantly higher among exposed subjects (3.6) than for unex- posed (2.4) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576

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Epidemiology Extraction Table: Gastrointestinal

Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
stomach bloats/swells Study Design: Cross-Sectional Health Effect: Gastrointestinal	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of stomach bloats/swells was significantly higher among exposed subjects (5.4) than for unexposed (2.6) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
Colon cancer (Y/N) Study Design: Case-Control Health Effect: Gastrointestinal	adults male & female 347 individuals with diagnoses of colon cancer in the Wisconsin Cancer Reporting System, 639 individuals from the Wisconsin Cancer Reporting System with diagnoses of cancer outside of the gastrointestinal and urinary systems, and 611 healthy individuals from Wisconsin, all ranging from 50-89 years of age.	1,1,1-Trichloroethane in municipal groundwater supply across 4 time points (1951, 1961, 1971, 1981), (micrograms/L), no central tendency; estimated via model	Colon cancer cases positively associated with ≥ 2 micrograms/L of 1,1,1-Trichloroethane exposure when compared to general population controls (1951, 1971. Positive association with < 10 micrograms/L of 1,1,1-Trichloroethane exposure when compared to general population controls in 1951 and when compared with cancer controls for 1951 and 1971. Significant associations were not otherwise found. Comments: Exposure measure model included participant residential history, water consumption habits, and ppb for 1,1,1-Trichloroethane measured in 1984-1986.	Medium	Young et al. 1990 1069372

Epidemiology Extraction Table: Immune/Hematological					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Swollen glands Study Design: Cross-Sectional Health Effect: Im- mune/Hematological	adults male & female Barrett Station (1989-1990), United States, 672 Black adults living near Superfund sites	1,1,2-trichloroethane, exposure level central tendency not re- ported	No statistically significant associations. Comments: "Excess prevalence" outcome de- fined as [(high exposure prevalence - low exposure prevalence)/low exposure prevalence] * 100. Expo- sure measured via "cumulative exposure" defined as the sum of residential distance to 2 Superfund sites * number of months in residence, summed over 28 years, and then categorized into high ex- posure (top 10% of distribution of cumulative exposure scores) vs. low exposure (bottom 30% of distribution of cumulative exposure scores).	Uninformative	Dayal et al. 1995 200292
Lymphatic and hematopoietic cancer mortality Study Design: Cohort (Retrospec- tive) Health Effect: Im- mune/Hematological	occupational male & female 4,396 United Autoworkers members ever employed at automotive electronics man- ufacturing plants, Huntsville, AL, 1972 to 1993	1,1,1-trichloroethane (no other information provided)	No significant results for cause-specific mortality by duration of work.	Medium	nan 5452779
anemia Study Design: Cross-Sectional Health Effect: Im- mune/Hematological	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Prevalence of anemia was significantly higher among exposed subjects (38%) than for unexposed (not reported) (P unknown). Comments: p. 5	Low	Kilburn 1999 1576

Epidemiology Extraction Table: Irritation					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
throat irritation Study Design: Cross-Sectional Health Effect: Irritation	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of throat irritation was significantly higher among exposed subjects (5.5) than for unex- posed (2.6) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
eye irritation Study Design: Cross-Sectional Health Effect: Irritation	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of eye irritation was significantly higher among exposed subjects (5.5) than for unexposed (2.4) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576

Epidemiology Extraction Table: Lung/Respiratory					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Frequent allergies, breathing difficulty, persistent cough, irritated nose, lung irritation, frequent sinus ailments, sore throat/trouble swallowing Study Design: Cross-Sectional Health Effect: Lung/Respiratory	adults male & female Barrett Station (1989-1990), United States, 672 Black adults living near Superfund sites	1,1,2-trichloroethane, exposure level central tendency not reported	No statistically significant associations. Comments: "Excess prevalence" outcome defined as [(high exposure prevalence - low exposure prevalence)/low exposure prevalence] * 100. Exposure measured via "cumulative exposure" defined as the sum of residential distance to 2 Superfund sites * number of months in residence, summed over 28 years, and then categorized into high exposure (top 10% of distribution of cumulative exposure scores) vs. low exposure (bottom 30% of distribution of cumulative exposure scores).	Uninformative	Dayal et al. 1995 200292
Trachea, bronchus, and lung cancer mortality Study Design: Cohort (Retrospective) Health Effect: Lung/Respiratory	occupational male & female 4,396 United Autoworkers members ever employed at automotive electronics manufacturing plants, Huntsville, AL, 1972 to 1993	1,1,1-trichloroethane (no other information provided)	No significant results for cause-specific mortality by duration of work.	Medium	nan 5452779
Chest tightness Study Design: Cross-Sectional Health Effect: Lung/Respiratory	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): >1200	Frequency of chest tightness was significantly higher among exposed subjects (4.9) compared to unexposed subjects (2.1) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
Dry cough Study Design: Cross-Sectional Health Effect: Lung/Respiratory	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): >1200	Frequency of dry cough was significantly higher among exposed subjects (4.3) compared to unexposed subjects (2.3) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
Cough with mucus Study Design: Cross-Sectional Health Effect: Lung/Respiratory	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): >1200	Frequency of cough with mucus was significantly higher among exposed subjects (5.8) compared to unexposed subjects (2.8) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576

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Epidemiology Extraction Table: Lung/Respiratory					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Cough with blood Study Design: Cross-Sectional Health Effect: Lung/Respiratory	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): >1200	Frequency of cough with blood was significantly higher among exposed subjects (2.2) compared to unexposed subjects (1.2) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
Phlegm Study Design: Cross-Sectional Health Effect: Lung/Respiratory	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): >1200	Prevalence of phlegm was significantly higher among exposed subjects (58.4%) compared to unexposed subjects (11.6%) (P = 0.0005). Comments: Table 2	Low	Kilburn 1999 1576
Chronic bronchitis Study Design: Cross-Sectional Health Effect: Lung/Respiratory	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): >1200	Prevalence of chronic bronchitis was significantly higher among exposed subjects (64.9%) compared to unexposed subjects (26.8%) (P = 0.0005). Comments: Table 2; "Chronic bronchitis was di- agnosed when cough and phlegm were present for most days of the week for 3 months in 2 succeed- ing years"	Low	Kilburn 1999 1576
Shortness of breath Study Design: Cross-Sectional Health Effect: Lung/Respiratory	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): >1200	Prevalence of shortness of breath was significantly higher among exposed subjects compared to un- exposed subjects when at rest (39.0% v. 4.5%, P = 0.0005), walking (53.6% v. 6.2%, P = 0.0005), and climbing stairs (72.2% v. 29.4%, P = 0.0005). Comments: Table 2	Low	Kilburn 1999 1576
Wheezing Study Design: Cross-Sectional Health Effect: Lung/Respiratory	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): >1200	Prevalence of wheezing was significantly higher among exposed subjects (50.5%) compared to unexposed subjects (8.9%) (P = 0.0005). Comments: Table 2	Low	Kilburn 1999 1576
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Epidemiology Extraction Table: Lung/Respiratory					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Shortness of breath with wheezing Study Design: Cross-Sectional Health Effect: Lung/Respiratory	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): >1200	Prevalence of shortness of breath with wheezing was significantly higher among exposed subjects (38.8%) compared to unexposed subjects (7.1%) (P = 0.0005). Comments: Table 2	Low	Kilburn 1999 1576
Normal breathing between attacks Study Design: Cross-Sectional Health Effect: Lung/Respiratory	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): >1200	Prevalence of normal breathing between attacks was significantly higher among exposed subjects (77.1%) compared to unexposed subjects (41.7%) (P = 0.001). Comments: Table 2	Low	Kilburn 1999 1576
Pleurisy (pain on breathing) Study Design: Cross-Sectional Health Effect: Lung/Respiratory	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): >1200	Prevalence of pleurisy was significantly higher among exposed subjects (44%) compared to unex- posed subjects (not reported) (P unknown). Comments: Text p. 248	Low	Kilburn 1999 1576
Forced vital capacity (FVC) Study Design: Cross-Sectional Health Effect: Lung/Respiratory	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): >1200	FVC was significantly lower among exposed sub- jects (99.5%, SD = 13.7) compared to unexposed subjects (103.0%, SD = 12.9) (P = 0.034). No statistical differences were reported for FEV1, FEF25-75, FEF75-85, RV/TLC, and TLC. Comments: Table 3	Low	Kilburn 1999 1576
abnormal radiographs Study Design: Cross-Sectional Health Effect: Lung/Respiratory	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Prevalence of abnormal radiographs was signif- icantly higher among exposed subjects (12.3%) than for unexposed (5.1%) (P = 0.01). Comments: Table 2	Low	Kilburn 1999 1576

Epidemiology Extraction Table: Mortality					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
All-cause mortality; all cancer mortality; cardiovascular disease mortality; trachea, bronchus, and lung cancer mortality; lymphatic and hematopoietic cancer mortality; brain and nervous system cancer mortality; cerebrovascular disease mortality; nervous system disorders mortality; digestive system diseases mortality; genitourinary diseases mortality; acute glomerulonephritis and renal failure mortality; chronic nephritis and renal failure mortality Study Design: Cohort (Retrospective) Health Effect: Mortality	occupational male & female 4,396 United Autoworkers members ever employed at automotive electronics manufacturing plants, Huntsville, AL, 1972 to 1993	1,1,1-trichloroethane (no other information provided)	Rate ratio (95% CI) for all-cause mortality in all workers:>5-15 years employment vs. <=5 years: 0.88 (0.75, 1.03)>15 years employment vs. <=5 years: 0.83 (0.71, 0.97)Rate ratio (95% CI) for all-cause mortality in female workers:>5-15 years employment vs. <=5 years: 0.88 (0.70, 1.09)>15 years employment vs. <=5 years: 0.73 (0.59, 0.90)Rate ratio (95% CI) for all-cause mortality in male workers:>5-15 years employment vs. <=5 years: 0.90 (0.72, 1.12)>15 years employment vs. <=5 years: 0.98 (0.78, 1.23)Rate ratio (95% CI) for all-cause mortality in all workers employed for 3 or more years:>5-15 years employment vs. 3-5 years: 0.91 (0.76, 1.10)>15 years employment vs. 3-5 years: 0.86 (0.71, 1.04)No other significant results for cause-specific mortality by duration of work.	Medium	nan 5452779

Epidemiology Extraction Table: Musculoskeletal					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
rheumatic pain Study Design: Cross-Sectional Health Effect: Musculoskeletal	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Prevalence of rheumatic pain was significantly higher among exposed subjects (32%) than unexposed subjects (not reported) (P unknown).Reporting of four symptoms out of the ten that comprise the American Rheumatism Association's (ARA) criteria for lupus erythematosus was significantly higher among exposed subjects (34%) compared to unexposed subjects (0.9%) (P<0.0000). Comments: p. 5	Low	Kilburn 1999 1576

Epidemiology Extraction Table: Neurological/Behavioral					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Convulsions, dizziness/blackouts, frequent headaches, learning difficulties, nervousness, numbness in fingers/toes, sleeping difficulties, tremors, unusual fatigue, decreased sense of smell, peculiar odor/taste Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults male & female Barrett Station (1989-1990), United States, 672 Black adults living near Superfund sites	1,1,2-trichloroethane, exposure level central tendency not re- ported	Excess prevalence of dizziness/blackouts in high exposure group (top 10% of exposure distribution) vs. low exposure group (bottom 30% of exposure distribution): 27.74% (p < 0.05) Excess prevalence of learning difficulties in high exposure group (top 10% of exposure distribution) vs. low exposure group (bottom 30% of exposure distribution): 240.63% (p < 0.001) Excess prevalence of nervousness in high exposure group (top 10% of exposure distribution) vs. low exposure group (bottom 30% of exposure distribution): 44.64% (p < 0.001) Excess prevalence of numbness in fingers/toes in high exposure group (top 10% of exposure distribution) vs. low exposure group (bottom 30% of exposure distribution): 43.34% (p < 0.001) Excess prevalence of sleeping difficulties in high exposure group (top 10% of exposure distribution) vs. low exposure group (bottom 30% of exposure distribution): 54.95% (p < 0.001) Excess prevalence of unusual fatigue in high exposure group (top 10% of exposure distribution) vs. low exposure group (bottom 30% of exposure distribution): 100.92% (p < 0.001) Excess prevalence of decreased sense of smell in high exposure group (top 10% of exposure distribution) vs. low exposure group (bottom 30% of exposure distribution): 53.16 (p < 0.05) Excess prevalence of peculiar odor/taste in high exposure group (top 10% of exposure distribution) vs. low exposure group (bottom 30% of exposure distribution): 84.43% (p < 0.01) No significant associations reported with convulsions, frequent headaches, or tremors. Comments: "Excess prevalence" outcome defined as [(high exposure prevalence - low exposure prevalence)/low exposure prevalence] * 100. Exposure measured via "cumulative exposure" defined as the sum of residential distance to 2 Superfund sites * number of months in residence, summed over 28 years, and then categorized into high exposure (top 10% of distribution of cumulative exposure scores) vs. low exposure (bottom 30% of distribution of cumulative exposure scores).	Uninformative	Dayal et al. 1995 200292

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Epidemiology Extraction Table: Neurological/Behavioral					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Nervous system disorders mortality; cerebrovascular disease mortality, brain and nervous system cancer mortality Study Design: Cohort (Retrospective) Health Effect: Neurological/Behavioral	occupational male & female 4,396 United Autoworkers members ever employed at automotive electronics manufacturing plants, Huntsville, AL, 1972 to 1993	1,1,1-trichloroethane (no other information provided)	No significant results for cause-specific mortality by duration of work.	Medium	nan 5452779
simple reaction time Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Simple reaction time was significantly slower among exposed subjects (349 ms, SD = 145) than for unexposed (289 ms, SD = 87) (P = 0.0005). Comments: Table 4; authors report mean differences remained statistically significant after adjusting for age and education (data not shown).	Medium	Kilburn 1999 1576
choice reaction time Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Choice reaction time was significantly slower among exposed subjects (628 ms, SD = 165) than for unexposed (532 ms, SD = 95) (P = 0.0005). Comments: Table 4; authors report mean differences remained statistically significant after adjusting for age and education (data not shown).	Medium	Kilburn 1999 1576
balance, sway speed Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Sway speed with eyes open was significantly different among exposed subjects (0.92 cm/s, SD = 0.36) than for unexposed (0.76 cm/s, SD = 0.16) (P = 0.0005). Sway speed with eyes closed was significantly different among exposed subjects (1.60 cm/s, SD = 0.76) than for unexposed (1.30 cm/s, SD = 0.38) (P = 0.0005). Comments: Table 4; authors report mean differences remained statistically significant after adjusting for age and education (data not shown).	Medium	Kilburn 1999 1576
color vision score Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Color discrimination was significantly poorer among exposed subjects (12.2, SD = 1.5) than for unexposed (11.8, SD = 1.1) (P = 0.022). Comments: Table 4	Medium	Kilburn 1999 1576

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Epidemiology Extraction Table: Neurological/Behavioral					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
blink reflex latency Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects; additional 117 unexposed subjects from Arizona.	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Blink reflex latency was abnormal among exposed subjects from Tinker AFB (Right: 13.8 ms +/- 1.8; Left: 13.8 ms +/- 1.8) compared to unexposed subjects from Arizona (Right: 12.8 ms +/- 2.1; Left: 12.9 ms +/- 2.1) (Right: P = 0.0003; Left: P = 0.00005). No significant differences were reported between exposed subjects and unexposed subjects from Oklahoma. Comments: Table 5	Medium	Kilburn 1999 1576
Cognitive function: Culture Fair A Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	No significant differences observed between exposed and unexposed subjects. Comments: Table 4	Medium	Kilburn 1999 1576
Cognitive function: Vocabulary Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	No significant differences observed between means of exposed and unexposed subjects. After adjusting for covariates (not specified), the mean difference between groups became statistically significant (mean difference = 2.50, SD = 0.95, P <0.007). Comments: Table 4 and p. 5; Adjustment factors are not identified.	Medium	Kilburn 1999 1576
Perceptual motor speed: pegboard dominant Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	No significant differences observed between exposed and unexposed subjects. Comments: Table 4	Medium	Kilburn 1999 1576
Perceptual motor speed: trail making Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Trail making A performance was statistically different between exposed subjects (37.5, SD = 14.0) and unexposed subjects (33.2, SD = 11.3) (P = 0.008).No statistical differences reported for Trail making B performance. Comments: Table 4; authors report mean differences for trail making A remained statistically significant after adjusting for age and education (data not shown).	Medium	Kilburn 1999 1576

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Epidemiology Extraction Table: Neurological/Behavioral					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
reduced sense of smell Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m ³): <1200	Frequency of reduced sense of smell was significantly higher among exposed subjects (6.0) than for unexposed (1.9) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
headache Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m ³): <1200	Frequency of headache was significantly higher among exposed subjects (6.5) than for unexposed (4.0) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
dizziness Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m ³): <1200	Frequency of dizziness was significantly higher among exposed subjects (4.8) than for unexposed (2.2) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
lightheadedly Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m ³): <1200	Frequency of lightheadedly was significantly higher among exposed subjects (5.0) than for unexposed (2.5) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
unusual exhilaration Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m ³): <1200	Frequency of unusual exhilaration was significantly higher among exposed subjects (2.3) than for unexposed (1.5) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
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Epidemiology Extraction Table: Neurological/Behavioral					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
balance disturbance Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of balance disturbance was significantly higher among exposed subjects (5.0) than for unex- posed (2.1) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
loss of consciousness Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of loss of consciousness was signifi- cantly higher among exposed subjects (1.8) than for unexposed (1.3) (P = 0.034). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
extreme fatigue Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of extreme fatigue was significantly higher among exposed subjects (7.8) than for unex- posed (2.9) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
somnolence Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of somnolence was significantly higher among exposed subjects (6.4) than for unexposed (2.3) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
cannot fall asleep Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of cannot fall asleep was significantly higher among exposed subjects (4.8) than for unex- posed (2.6) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
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Epidemiology Extraction Table: Neurological/Behavioral					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
wakes frequently Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of waking up frequently was significantly higher among exposed subjects (6.1) than for unexposed (2.8) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
sleeps only a few hours Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of sleeping for only a few hours was significantly higher among exposed subjects (5.6) than for unexposed (2.9) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
irritability Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of irritability was significantly higher among exposed subjects (6.7) than for unexposed (3.2) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
lack of concentration Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of lack of concentration was significantly higher among exposed subjects (7.0) than for unexposed (2.8) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
recent memory loss Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of recent memory loss was significantly higher among exposed subjects (7.5) than for unexposed (2.9) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
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Epidemiology Extraction Table: Neurological/Behavioral					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
long-term memory loss Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of long-term memory loss was significantly higher among exposed subjects (6.0) than for unexposed (2.1) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
mood instability Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of mood instability was significantly higher among exposed subjects (5.7) than for unexposed (2.0) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
decreased libido Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of decreased libido was significantly higher among exposed subjects (5.9) than for unexposed (2.5) (P = 0.000). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
decreased alcohol tolerance Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of decreased alcohol tolerance was significantly higher among exposed subjects (3.4) than for unexposed (2.3) (P = 0.008). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
numb fingers Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Prevalence of numb fingers was significantly higher among exposed subjects (~72%) than for unexposed (not reported) (P unknown). Comments: Table 6; symptoms frequency scale: 1, never to 11, always; p. 5	Low	Kilburn 1999 1576
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Epidemiology Extraction Table: Neurological/Behavioral					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Profile of mood states (POMS) Study Design: Cross-Sectional Health Effect: Neurological/Behavioral	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m ³): <1200	POMS scores were significantly higher among exposed (83.0, SD = 42.4) than unexposed subjects (14.5, SD = 28.2) (P = 0.0005). Comments: Table 4	Low	Kilburn 1999 1576
Nocturnal pulse oximetry (to assess sleep apnea), neurotoxicity symptom checklist, and 8 neurobehavioral tests (Simple Reaction Time, Symbol-Digit Substitution, Associate Learning and Recall, Digit Span Forwards and Backwards, Color Word Vigilance, Hand-Eye Coordination). Oximetry results categorized as desaturated at <90%. Study Design: Cohort Health Effect: Neurological/Behavioral	adults male & female 21 men and women from 5 military printing shops in Belgium or Germany. Controls were 21 drivers from the army matched on age, sex, education, and language.	Exposure to VOCs in print shops assessed as binary (yes/no) variable . Personal sampling was conducted at each worksite on one work day; average worksite concentrations of 1,1,1-trichloroethane ranged between non detect and 680.9 mg/m ³ .	VOC exposure was associated with increased frequency of mood disturbances, impaired performance on tests of hand-eye coordination, and increased frequency and duration of nocturnal oxygen desaturation. A significant interaction between exposure and smoking was observed for nocturnal desaturation, due to greater effect of exposure on nonsmokers.	Medium	Laire et al. 1997 677146

Epidemiology Extraction Table: Ocular & Sensory					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Irritated eyes Study Design: Cross-Sectional Health Effect: Ocular & Sensory	adults male & female Barrett Station (1989-1990), United States, 672 Black adults living near Superfund sites	1,1,2-trichloroethane, exposure level central tendency not re- ported	No statistically significant associations. Comments: "Excess prevalence" outcome de- fined as [(high exposure prevalence - low exposure prevalence)/low exposure prevalence] * 100. Expo- sure measured via "cumulative exposure" defined as the sum of residential distance to 2 Superfund sites * number of months in residence, summed over 28 years, and then categorized into high ex- posure (top 10% of distribution of cumulative exposure scores) vs. low exposure (bottom 30% of distribution of cumulative exposure scores).	Uninformative	Dayal et al. 1995 200292

Epidemiology Extraction Table: Other

Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Self-reported symptoms of "sick building syndrome" including neurological (dizziness, headaches), skin (rash, itch), ocular (itchy or painful), musculoskeletal (muscle pain), and irritation (nasal, sore throat) occurring at any time after moving into the home. All symptoms were grouped for analysis. Study Design: Cross-Sectional Health Effect: Other (sick building syndrome)	adults male & female Dailin China; 59 men and 50 women (from same household) from a housing estate; August 2007.	1,1,1-trichloroethane: Median 2.0 ug/m3 (bedroom of females with symptoms) or 0.6 ug/m3 (females without symptoms). Median 0.9 ug/m3 (bedroom of males with symptoms) or 0.6 ug/m3 (males without symptoms). Air concentration in bedroom, kitchen, and outdoors measured by 24-hr diffusion sampling and analyzed by GC/MS.	Bedroom air concentrations in women with symptoms were significantly higher ($p < 0.05$) than in bedrooms of females without symptoms. Median 2.0 ug/m3 (bedroom of females with symptoms) or 0.6 ug/m3 (females without symptoms).	Uninformative	Guo et al. 2013 1938385
finger nail changes Study Design: Cross-Sectional Health Effect: Other (Finger nails, dry mouth)	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of finger nail changes was significantly higher among exposed subjects (4.1) than for unexposed (1.5) ($P = 0.000$). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
Dry mouth Study Design: Cross-Sectional Health Effect: Other (Finger nails, dry mouth)	adults, occupational male & female Jet engine repair workers (1993), United States (Tinker AFB, Oklahoma City), 154 workers and 112 unexposed subjects	1,1,1-Trichloroethane, 8-hour weighted average from area samplers (mg/m3): <1200	Frequency of dry mouth was significantly higher among exposed subjects (5.9) than for unexposed (2.8) ($P = 0.000$). Comments: Table 6; symptoms frequency scale: 1, never to 11, always	Low	Kilburn 1999 1576
Nocturnal pulse oximetry (to assess sleep apnea). Oximetry results categorized as desaturated at <90%. Measurements include the presence of desaturation during the night, the frequency of desaturation, the duration of the desaturation, and the lowest level of desaturation during the night. Study Design: Cohort Health Effect: Other	adults male & female 21 men and women from 5 military printing shops in Belgium or Germany. Controls were 21 drivers from the army matched on age, sex, education, and language.	Exposure to VOCs in print shops assessed as binary (yes/no) variable. Personal sampling was conducted at each worksite on one work day; average worksite concentrations of 1,1,1-trichloroethane ranged between non detect and 680.9 mg/m3.	VOC exposure was associated with increased frequency and duration of nocturnal oxygen desaturation. A significant interaction between exposure and smoking was observed for nocturnal desaturation, due to greater effect of exposure on nonsmokers.	Medium	Laire et al. 1997 677146

Epidemiology Extraction Table: Renal/Kidney

Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Unusual color urine Study Design: Cross-Sectional Health Effect: Renal/Kidney	adults male & female Barrett Station (1989-1990), United States, 672 Black adults living near Superfund sites	1,1,2-trichloroethane, exposure level central tendency not re- ported	No statistically significant associations. Comments: "Excess prevalence" outcome de- fined as [(high exposure prevalence - low exposure prevalence)/low exposure prevalence] * 100. Expo- sure measured via "cumulative exposure" defined as the sum of residential distance to 2 Superfund sites * number of months in residence, summed over 28 years, and then categorized into high ex- posure (top 10% of distribution of cumulative exposure scores) vs. low exposure (bottom 30% of distribution of cumulative exposure scores).	Uninformative	Dayal et al. 1995 200292
Genitourinary disease mortality, acute glomerulonephritis and renal failure mortality; chronic nephritis and renal failure mortality Study Design: Cohort (Retrospec- tive) Health Effect: Renal/Kidney	occupational male & female 4,396 United Autoworkers members ever employed at automotive electronics man- ufacturing plants, Huntsville, AL, 1972 to 1993	1,1,1-trichloroethane (no other information provided)	No significant results for cause-specific mortality by duration of work.	Medium	nan 5452779
renal cell carcinoma Study Design: Case-Control Health Effect: Renal/Kidney	occupational male & female A group of 438 cases (273 men and 165 women) were selected from the Minnesota Cancer Surveillance System, Minnesota, US, 1988-1990	The prevalence of exposure to 1,1,2-trichloroethane in men was 7% and 8% in cases and controls, respectively, in women was 2% in both cases and con- trols, and 5% and 6% in cases and controls, respectively, in all participants. Exposure estimates for each group were not pro- vided.	No significant increase in the risk of renal cell carcinoma was observed with exposure to 1,1,2- trichloroethane among men (OR 0.90, 95% CI 0.5-1.6) or women (OR 0.95, 95% CI 0.2-4.4) separately, or for all participants exposed (OR 0.91, 95% CI 0.5-1.6).	Medium	Dosemeci et al. 1999 4697224
renal cell carcinoma Study Design: Case-Control Health Effect: Renal/Kidney	occupational male & female A group of 438 cases (273 men and 165 women) were selected from the Minnesota Cancer Surveillance System, Minnesota, US, 1988-1990	The prevalence of exposure to methyl chloroform in men was 19% and 21% in cases and controls, respectively, in women was 8% and 7% in cases and controls, respectively, and 15% and 17% in cases and controls, respectively, in all participants. Exposure estimates for each group were not provided.	No significant increase in the risk of renal cell carcinoma was observed with exposure to methyl chloroform among men (OR 0.88, 95% CI 0.6-1.3) or women (OR 1.26, 95% CI 0.6-2.8) separately, or for all participants exposed (OR 0.94, 95% CI 0.7-1.3).	Medium	Dosemeci et al. 1999 4697224

Epidemiology Extraction Table: Reproductive/Developmental					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Fetal growth and development: -Birthweight (term births), low birthweight (term births), very low birthweight, small for ges- tational age-Preterm birth-Fetal death (>20 weeks' gestation)- Congenital anomalies: (i) nervous system (central nervous system, neural tube defects); (ii) oral cleft; (iii) cardiovascular (total cardiac, major cardiac, ventricular septum defects); and (iv) any surveillance defect excluding chromosomal de- fects. Study Design: Cohort (Retrospec- tive) Health Effect: Reproduc- tive/Developmental	infants (birth to 2y) male & female 80,938 live births and 594 fetal deaths that occurred in 75 NJ towns during the period 1985-1988. Data came from birth certificates, fetal death certificates (> 20 weeks' gestation) and the NJ Birth Defects Registry.	The distribution of 1,1,1- trichloroethane was not pre- sented since the magnitude of odds ratios for this contaminant were not ≥ 1.5 .	No significant associations and no odds ratios > 1.5.	Medium	Bove, 1996 200239
Fetal growth and development: -Birthweight (term births), low birthweight (term births), very low birthweight, small for ges- tational age-Preterm birth-Fetal death (>20 weeks' gestation)- Congenital anomalies: (i) nervous system (central nervous system, neural tube defects); (ii) oral cleft; (iii) cardiovascular (total cardiac, major cardiac, ventricular septum defects); and (iv) any surveillance defect excluding chromosomal de- fects. Study Design: Cohort (Retrospec- tive) Health Effect: Reproduc- tive/Developmental	infants (birth to 2y) male & female 80,938 live births and 594 fetal deaths that occurred in 75 NJ towns during the period 1985-1988. Data came from birth certificates, fetal death certificates (> 20 weeks' gestation) and the NJ Birth Defects Registry.	The distribution of 1,1,1- trichloroethane was not pre- sented since the magnitude of odds ratios for this contaminant were not ≥ 1.5 .	No significant associations and no odds ratios > 1.5.	Uninformative	Bove, 1996 200239

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Epidemiology Extraction Table: Reproductive/Developmental					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
-Birthweight (term births), low birthweight (term births), very low birthweight, small for gestational age. -Preterm birth. -Fetal death (> 20 weeks' gestation). -Congenital anomalies: (i) nervous system (central nervous system, neural tube defects); (ii) oral cleft; (iii) cardiovascular (total cardiac, major cardiac, ventricular septum defects); and (iv) any surveillance defect excluding chromosomal defects. Study Design: Cohort (Retrospective) Health Effect: Reproductive/Developmental	infants (birth to 2y) male & female 80,938 live births and 594 fetal deaths that occurred in 75 NJ towns during the period 1985-1988. Data came from birth certificates, fetal death certificates (> 20 weeks' gestation) and the NJ Birth Defects Registry.	1,1,1-trichloroethane (1,1,2-trichloroethane isomer): 6.2% and 6.0% exposed to > 2ppb in the 1st trimester and entire pregnancy, respectively. Average maximum exposures 16 ppb 1st trimester, 15 ppb entire pregnancy.	Results: no significant associations. Odds ratios > 1.5 for 1,1,1-trichloroethane > 2 ppb: none.	Medium	Bove et al., 1995 194932
birth defects (neural tube defects, limbs deficiencies, oral cleft defects, heart defects) Study Design: Case-Control Health Effect: Reproductive/Developmental	adults female 305,090 mothers in Texas, for births occurring in 1996-2008	1,1,2-trichloroethane, exposure risk value calculated by Emission Weighted Proximity Model, which assigns a risk value to each subject based on residential proximity to emission sources and annual pounds of chemical emitted. No summary statistics provided on raw amount of exposure.	In women of all ages, exposure risk values greater than 0 were positively associated with neural tube defects OR=1.56 (CI 1.11, 2.18), spina bifida OR=1.94 (CI 1.32, 2.84), septal heart defects OR=1.12 (CI 1.01, 1.24), and cleft palate in the 4th quartile of exposure OR=1.99 (CI 1.05, 3.76).	High	Brender et al. 2014 2799700
Bruising, peculiar odor/taste Study Design: Cross-Sectional Health Effect: Reproductive/Developmental	adults male & female Barrett Station (1989-1990), United States, 672 Black adults living near Superfund sites	1,1,2-trichloroethane, exposure level central tendency not reported	No statistically significant associations. Comments: "Excess prevalence" outcome defined as [(high exposure prevalence - low exposure prevalence)/low exposure prevalence] * 100. Exposure measured via "cumulative exposure" defined as the sum of residential distance to 2 Superfund sites * number of months in residence, summed over 28 years, and then categorized into high exposure (top 10% of distribution of cumulative exposure scores) vs. low exposure (bottom 30% of distribution of cumulative exposure scores).	Uninformative	Dayal et al. 1995 200292
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Epidemiology Extraction Table: Reproductive/Developmental					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Fecundability density ratios Study Design: Case-Control (Nested) Health Effect: Reproduc- tive/Developmental	occupational male 282 couples were included in this study conducted in Finland from 1973-1985	Paternal participants were oc- cupationally exposed to or- ganic solvents, including 1,1,1- trichloroethane, and based on occupational history, were clas- sified into categories of their likelihood of exposure (unex- posed, potentially exposed, and likely exposed) and exposure levels (none, intermediate/low, high/frequent). blood, serum, or plasma	No statistically significant changes in the FDR were reported when 1,1,1-trichloroethane was examined individually. Comments: Although biomonitoring information was reported, data were limited and were not used to categorize exposure levels	Medium	Sallmen et al. 1998 671475
spontaneous abortion Study Design: Case-Control (Nested) Health Effect: Reproduc- tive/Developmental	occupational male A group of 371 couples (120 cases, 251 referents), Finland, 1973-1983	Occupational exposures to or- ganic solvents, including 1,1,1- trichloroethane, were classified by likelihood of exposure (unex- posed, potentially exposed, and likely exposed) and the quantity of exposure (high/frequent and low/rare) nan	1,1,1-trichloroethane exposure did not significantly increase odds ratio of spontaneous abortion in unadjusted model (OR = 0.9, 95% CI = 0.3-2.3). Comments: detailed information for biomonitoring results and matrix were not provided and occupa- tional history was used to classify participants into exposure categories	Medium	Taskinen et al. 1989 5414
spontaneous abortions Study Design: Case-Control Health Effect: Reproduc- tive/Developmental	pregnant women female A total of 1,105 pregnant women, California, 1980- 1985	1,1,1-trichloroethane, mea- sured at 1,700 ppb in well 13, modeled from 10 ppb in 1980 gradually increasing to 6,000 ppb in 1981.	During the contamination period (1980-1981), sig- nificantly increased spontaneous abortions were observed in the original census tracts (i.e., those included in a previous investigation) when com- paring exposed vs unexposed groups unadjusted for confounders (OR = 3.5 95% CI 1.2-10.3). Af- ter adjustment, the OR increased to 5.0 (95% CI not provided). No significant associations were observed in the new census tracts during the con- tamination period before or after adjustment for confounders. In both areas, no significant associa- tions were observed during the post-contamination period (1982-1985). Comments: The total number of included exposed and unexposed individuals was not provided.	Medium	Wrensch et al. 1990 708475

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Epidemiology Extraction Table: Reproductive/Developmental					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
birth defects Study Design: Case-Control Health Effect: Reproductive/Developmental	pregnant women female A total of 1,105 pregnant women, California, 1980-1985	1,1,1-trichloroethane, measured at 1,700 ppb in well 13, modeled from 10 ppb in 1980 gradually increasing to 6,000 ppb in 1981.	During the contamination period (1980-1981), significantly increased birth defects were reported in the original census tracts among the exposed group unadjusted for confounders (OR = 4.3, 95% CI 1.2-14.7). No adjusted analyses are reported. No significant associations were found for the new census tracts during the contamination period, or for any census tracts post-contamination. Comments: The total number of included exposed and unexposed individuals was not provided, however, the number and percentage of birth abnormalities for each group was provided in the tables.	Medium	Wrensch et al. 1990 708475
Low birth weight Study Design: Case-Control Health Effect: Reproductive/Developmental	pregnant women female A total of 1,105 pregnant women, California, 1980-1985	1,1,1-trichloroethane, measured at 1,700 ppb in well 13, modeled from 10 ppb in 1980 gradually increasing to 6,000 ppb in 1981.	No significant changes in low birth weight were observed. Comments: The total number of included exposed and unexposed individuals was not provided.	Medium	Wrensch et al. 1990 708475

Epidemiology Extraction Table: Skin and Connective Tissue					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Skin rashes, bruising Study Design: Cross-Sectional Health Effect: Skin and Connective Tissue	adults male & female Barrett Station (1989-1990), United States, 672 Black adults living near Superfund sites	1,1,2-trichloroethane, exposure level central tendency not re- ported	Excess prevalence of skin rashes in high exposure group (top 10% of exposure distribution) vs. low exposure group (bottom 30% of exposure distribu- tion):35.33% (p <0.01)No statistically significant associations for bruising. Comments: "Excess prevalence" outcome de- fined as [(high exposure prevalence - low exposure prevalence)/low exposure prevalence] * 100. Expo- sure measured via "cumulative exposure" defined as the sum of residential distance to 2 Superfund sites * number of months in residence, summed over 28 years, and then categorized into high ex- posure (top 10% of distribution of cumulative exposure scores) vs. low exposure (bottom 30% of distribution of cumulative exposure scores).	Uninformative	Dayal et al. 1995 200292

Epidemiology Extraction Table: Irritation					
Measured Effect/ Endpoints	Study Population	Exposure	Results	Overall Quality Determination	Citation and HERO ID
Skin-fold thickness, erythema, edema, fissuring, and scaling Study Design: Other intentional dosing study Health Effect: Irritation	adults male One volunteer, 1984	Daily skin application of 0.1 mL 1,1,2-trichloroethane for 15 days	No effects observed.	Medium	Wahlberg, 1984 5469150