Add Chapter 50. Corrective Action

Article 1. Toxicity Criteria for Human Health Risk Assessments, Screening Levels, and Remediation Goals

68400.5. Toxicity Criteria for Human Health Risk Assessments, Screening Levels, and Remediation Goals

For any release of hazardous waste or hazardous constituents, the human health risk assessment calculations, including, but not limited to, all cancer risk and non-cancer hazard screening levels and corrective action objectives, shall use the toxicity criteria specified in California Code of Regulations, title 22, section 69021 and attain the human health protection specified in section 69022, subdivisions (a) and (b).

Authority cited: sections 25150, 25159, 25159.5, 58004, and 58012, Health and Safety Code. Reference: sections 25150, 25159, 25159.7, 25187, and 116365, Health and Safety Code; section 71110, Public Resources Code.

Add Chapter 51. Site Remediation

Article 2. Toxicity Criteria for Human Health Risk Assessments, Screening Levels, and Remediation Goals

69020. Applicability and Purpose

(a) This Chapter applies to the cleanup (e.g., response or remedial action) of releases of hazardous waste or hazardous waste constituents, hazardous materials, and hazardous substances (collectively, hazardous substances) to the environment that are subject to the provisions of Health and Safety Code, Division 20, Chapters 6.8 and 6.82. Section 69021 specifies the required toxicity criteria for use in setting all human health risk-based screening levels and human health risk-based remediation goals, and in all human health risk assessments for those sites.

(b) The purpose of this Chapter is to establish toxicity criteria, consistent with Health and Safety Code section 25356.1.5, for all human health risk assessments, human health risk-based screening levels, and human health risk-based remediation goals statewide, approved after the effective date of this Chapter. This Chapter does not replace applicable Maximum Contaminant Levels (MCLs) established under Health and Safety Code section 116365 or Title 42 United States Code section 300g as remediation goals.

(c) Terms used in this Chapter shall have the following meanings:

(1) "Contaminant of Potential Concern" (COPC) is a chemical or contaminant at or from the Site that is identified as a potential threat to human health or the environment, and whose site-specific data are of sufficient quality for use in any risk assessment.

(2) "Department" means the California Department of Toxic Substances Control.

(3) "IRIS" means the United States Environmental Protection Agency's (U.S. EPA's) Integrated Risk Information System identified in the U.S. EPA Office of Solid Waste and Emergency Response Directive Number 9285.7-53 (December 5, 2003, at page 3), for the unit risk factor, oral slope factor, reference dose, and reference concentration values in this U.S. EPA IRIS database, available online at https://www.epa.gov/iris, as it may be updated.

(4) "OEHHA" means the California Environmental Protection Agency's Office of Environmental Health Hazard Assessment.

(5) "Remediation Goal" is a contaminant concentration that is: (i) media-specific (e.g., for the air, groundwater, surface water, or soil affected by a release); (ii) site-specific (factoring in, for example, potential receptors, exposure pathways, contaminant background concentrations and reasonably anticipated future land uses); (iii) protective of human health and the environment; and (iv) used as a final cleanup goal for the response or corrective action.

(6) "Screening Level" is a generic risk-based concentration derived from standardized risk assessment equations combining exposure information assumptions with applicable toxicity criteria. Screening Levels are contaminant concentrations considered to be protective for humans (including sensitive groups) over a lifetime. Screening Levels calculated using the toxicity criteria under this Chapter do not address non-human health endpoints such as ecological impacts.

(7) "Site" has the same meaning as the term "facility" as defined by Health and Safety Code section 25323.9 and also includes "hazardous waste facilities" and "sites" as those terms are defined in 22 CCR 66260.10.

(8) "Total Petroleum Hydrocarbons" (TPH) is a term to describe a large family of several hundred chemical compounds derived from crude oil.

(d) Any other terms not defined above shall have the meanings specified in the following:

(1) Health and Safety Code section 25100 et seq., and its implementing regulations.

(2) Health and Safety Code section 25300 et seq.

Authority cited: sections 25150, 25159, 25159.5, 25351.5, 25395.64, 25395.71, 25395.92, 58004, and 58012, Health and Safety Code. Reference: sections 25150, 25159, 25159.7, 25187, 25355.8, 25356.1, 25356.1.5, 25395.92, 25395.94 and 116365, Health and Safety Code; section 71110, Public Resources Code; and section 300.430 of Title 40 of the Code of Federal Regulations; sections 300g and 9621 of Title 42 of the United States Code.

69021. Applicable Toxicity Criteria

Consistent with Health and Safety Code section 25356.1.5, all human health risk assessments, human health risk-based screening levels, and human health risk-

based remediation goals used for the cleanup of sites described under section 69020, subdivision (b), shall use the cancer and non-cancer toxicity criteria for each COPC from the following sources in the order listed below:

(a) The OEHHA peer-reviewed unit risk factors, oral slope factors, chronic reference exposure levels, reference dose(s) (RfDs), and blood lead value*s* in Table A and B of Appendix I to this Chapter, shall be used for the COPCs that are listed in that Appendix, so long as the Appendix I values remain no less stringent than toxicity criteria available from the source in subdivision (b) below. If Appendix I does not list toxicity criteria for a specific COPC or contains a value that is less stringent, then the toxicity criteria listed under section 69021, subdivision (b) shall be used.

(b) The peer-reviewed unit risk factors, oral slope factors, RfDs, and reference concentrations, in IRIS shall be used where either Appendix I does not specify toxicity criteria for a particular COPC, or the IRIS toxicity criteria value is more stringent than the value listed in Appendix I. If neither Appendix I nor IRIS lists toxicity criteria for a specific COPC, then the toxicity criteria listed under section 69021, subdivision (c) shall be used.

(c) Toxicity criteria from another source, that applies the best available science and is health-based, may be used in human health risk assessments upon approval by the Supervising Toxicologist, of the Department's Human and Ecological Risk Office, or his or her designee, when neither subdivision (a) nor subdivision (b) above specifies toxicity criteria for the particular COPC. Other sources include, but are not limited to: OEHHA toxicity criteria that are not listed in Appendix I (e.g., those toxicity criteria used in U.S. EPA's Regional Screening Levels), U.S. EPA Provisional Peer Reviewed Toxicity Values (PPRTVs), Agency for Toxic Substances and Disease Registry Minimal Risk Levels, PPRTV Appendix Screening Toxicity Values, and U.S. EPA Superfund Health Effects Assessment Summary Table values. However, use of TPH PPRTVs is not required, but may be determined to be appropriate based on site-specific circumstances. Any selected toxicity criteria or value used under this subdivision shall be consistent with Health and Safety Code section 25356.1.5, subdivisions (b) and (c).

Authority cited: sections 25150, 25159, 25159.5, 25351.5, 25395.64, 25395.71, 25395.92, 58004, and 58012, Health and Safety Code. Reference: sections 25150, 25159, 25159.7, 25187, 25355.8, 25356.1, 25356.1.5, 25395.92 and 25395.94, Health and Safety Code; section 71110, Public Resources Code; and section 300.430 of Title 40 of the Code of Federal Regulations.

69022. Screening Levels and Remediation Goals

(a) All human health risk assessments, human health risk-based screening levels, and human health risk-based remediation goals shall protect human health by using the toxicity criteria specified in section 69021 above.

(b) When based on human health risk or non-cancer hazard, to protect human health, screening levels for individual COPCs shall be set to:

(1) An incremental excess lifetime cancer risk to an individual of 1 x 10-6, and
(2) A hazard quotient of 1.

(c) All human health risk-based remediation goals for response actions conducted under Health and Safety Code, Division 20, Chapter 6.8, shall comply with Health and Safety Code section 25356.1.5.

Authority cited: sections 25150, 25159, 25159.5, 25351.5, 25395.64, 25395.71, 25395.92, 58004, and 58012, Health and Safety Code. Reference: sections 25150, 25159, 25159.7, 25187, 25355.8, 25356.1, 25356.1.5, 25395.92 and 25395.94, Health and Safety Code; section 71110, Public Resources Code; and section 300.430 of Title 40 of the Code of Federal Regulations.

Table A

			Cancer Potency Values				Non-cancer Health-Hazard Values			
			Oral Slope Factor (CSF_O)		Inhalation Unit Risk (IUR)		Oral Reference Dose (RfD_O)		Chronic Reference Exposure Level (REL)	
Analyte		CAS Registry Number	CSFo $(mg/kg\text{-}d)^{-1}$	Reference	IUR $(\mu g/m^3)^{-1}$	Reference	RfDo (mg/kg-d)	Reference	REL ($\mu g/m^3$)	Reference
1	Acetaldehyde	75-07-0	--	--	2.70E-06	OEHHA	--	--	--	--
2	Ammonia	7664-41-7	--	--	--	--	--	--	2.00E+02	OEHHA
3	Arsenic	7440-38-2	9.50E+00	OEHHA PHG	--	--	3.50E-06	OEHHA	1.50E-02	OEHHA
4	Arsine	7784-42-1	--	--	--	--	3.50E-06	OEHHA	1.50E-02	OEHHA
5	Benzene	71-43-2	1.00E-01	OEHHA	2.90E-05	OEHHA	--	--	3.00E+00	OEHHA
6	Benzidine	92-87-5	5.00E+02	OEHHA	1.40E-01	OEHHA	--	--	--	--
7	Benzo[a]anthracene	56-55-3	--	--	1.10E-04	OEHHA	--	--	--	--
8	Benzo[a]pyrene	50-32-8	--	--	1.10E-03	OEHHA	--	--	--	--
9	Benzo[b]fluoranthene	205-99-2	--	--	1.10E-04	OEHHA	--	--	--	--
10	Benzo[k]fluoranthene	207-08-9	--	--	1.10E-04	OEHHA	--	--	--	--
11	Beryllium	7440-41-7	--	--	--	--	2.00E-04	OEHHA PHG	7.00E-03	OEHHA
12	Beryllium oxide	1304-56-9	--	--	--	--	2.00E-04	OEHHA PHG	7.00E-03	OEHHA
13	Beryllium sulfate	13510-49-1	--	--	--	--	2.00E-04	OEHHA PHG	7.00E-03	OEHHA
14	Boron Trifluoride	7637-07-2	--	--	--	--	4.00E-02	OEHHA (Fluorides)	--	--
15	1,3-Butadiene	106-99-0	6.00E-01	OEHHA	1.70E-04	OEHHA	--	--	2.00E+00	OEHHA
16	Cadmium	7440-43-9	--	--	4.20E-03	OEHHA	--	--	--	--
17	Carbon tetrachloride	56-23-5	--	--	--	--	--	--	4.00E+01	OEHHA
18	Carbonyl sulfide	463-58-1	--	--	--	--	--	--	1.00E+01	OEHHA
19	Chromium (VI)	18540-29-9	5.00E-01	OEHHA PHG	1.50E-01	OEHHA	--	--	--	--
20	Chrysene	218-01-9	--	--	1.10E-05	OEHHA	--	--	--	--
21	Dibenz[a,h]anthracene	53-70-3	4.10E+00	OEHHA	1.20E-03	OEHHA	--	--	--	--
22	3,3'-Dichlorobenzidine	91-94-1	1.20E+00	OEHHA	3.40E-04	OEHHA	--	--	--	--
23	1,1-Dichloroethene	75-35-4	--	--	--	--	--	--	7.00E+01	OEHHA

Table A

			Cancer Potency Values				Non-cancer Health-Hazard Values			
			Oral Slope Factor (CSF_O)		Inhalation Unit Risk (IUR)		Oral Reference Dose (RfD_O)		Chronic Reference Exposure Level (REL)	
Analyte		CAS Registry Number	CSFo $(mg/kg\text{-}d)^{-1}$	Reference	IUR $(\mu g/m^3)^{-1}$	Reference	RfDo (mg/kg-d)	Reference	REL $(\mu g/m^3)$	Reference
24	Epichlorohydrin	106-89-8	8.00E-02	OEHHA	2.30E-05	OEHHA	--	--	--	--
25	bis(2-Chloroethyl) ether	111-44-4	2.50E+00	OEHHA	7.10E-04	OEHHA	--	--	--	--
26	Ethylene dibromide	106-93-4	--	--	--	--	--	--	8.00E-01	OEHHA
27	Formaldehyde	50-00-0	--	--	--	--	--	--	9.00E+00	OEHHA
28	HCH (mixed isomers)	608-73-1	4.00E+00	OEHHA	1.10E-03	OEHHA	--	--	--	--
29	Hexachlorobenzene	118-74-1	1.80E+00	OEHHA	5.10E-04	OEHHA	--	--	--	--
30	Hexachlorodibenzo-p-dioxin Mixture (2:1 1,2,3,7,8,9- and 1,2,3,6,7,8-)	Hexachlorodibenzo-p-dioxin Mixture	--	--	3.80E+00	OEHHA (WHO-05 TEF)	--	--	--	--
31	Hydrochloric acid	7647-01-0	--	--	--	--	--	--	9.00E+00	OEHHA
32	Indeno[1,2,3-cd]pyrene	193-39-5	--	--	1.10E-04	OEHHA	--	--	--	--
33	Lead and compounds#	7439-92-1	--	--	--	--	See Table B	OEHHA	--	--
34	Lead subacetate	1335-32-6	3.80E-02	OEHHA	1.10E-05	OEHHA	--	--	--	--
35	Mercuric Chloride	7487-94-7	--	--	--	--	1.60E-04	OEHHA REL	3.00E-02	OEHHA
36	Mercury	7439-97-6	--	--	--	--	1.60E-04	OEHHA REL	3.00E-02	OEHHA
37	Methylene Chloride	75-09-2	--	--	1.00E-06	OEHHA	--	--	4.00E+02	OEHHA
38	4,4'-Methylene-bis(2-chloroaniline)	101-14-4	1.50E+00	OEHHA	--	--	--	--	--	--
39	Methylene diphenyl diisocyanate	101-68-8	--	--	--	--	--	--	8.00E-02	OEHHA
40	Polymeric methylenediphenyl diisocyanate	9016-87-9	--	--	--	--	--	--	8.00E-02	OEHHA
41	Nickel	7440-02-0	--	--	2.60E-04	OEHHA	1.10E-02	OEHHA	1.40E-02	OEHHA
42	Nickel Hydroxide	12054-48-7	--	--	2.60E-04	OEHHA	1.10E-02	OEHHA	1.40E-02	OEHHA
43	Nickel Oxide	1313-99-1	--	--	2.60E-04	OEHHA	1.10E-02	OEHHA	2.00E-02	OEHHA
44	Nickel refinery dust	Nickel refinery dust	--	--	2.60E-04	OEHHA	1.10E-02	OEHHA	1.40E-02	OEHHA
45	Nickel subsulfide	12035-72-2	--	--	--	--	1.10E-02	OEHHA	1.40E-02	OEHHA

Table A

			Cancer Potency Values				Non-cancer Health-Hazard Values			
			Oral Slope Factor (CSF_O)		Inhalation Unit Risk (IUR)		Oral Reference Dose (RfD_O)		Chronic Reference Exposure Level (REL)	
Analyte		CAS Registry Number	CSFo $(mg/kg\text{-}d)^{-1}$	Reference	IUR $(\mu g/m^3)^{-1}$	Reference	RfDo (mg/kg-d)	Reference	REL $(\mu g/m^3)$	Reference
46	N-Nitroso-di-n-butylamine	924-16-3	1.10E+01	OEHHA	3.10E-03	OEHHA	--	--	--	--
47	Styrene	100-42-5	--	--	--	--	--	--	9.00E+02	OEHHA
48	Tetrachloroethene	127-18-4	5.40E-01	OEHHA PHG	6.10E-06	OEHHA	--	--	--	--
49	Toluene	108-88-3	--	--	--	--	--	--	3.00E+02	OEHHA
50	Toluene 2,4/2,6-Diisocyanates	26471-62-5	3.90E-02	OEHHA	--	--	--	--	8.00E-03	OEHHA
51	Toluene-2,4-diisocyanate	584-84-9	3.90E-02	OEHHA (toluene diisocyantes)	--	--	--	--	8.00E-03	OEHHA (toluene diisocyantes)
52	Toluene-2,6-diisocyanate	91-08-7	3.90E-02	OEHHA (toluene diisocyantes)	--	--	--	--	8.00E-03	OEHHA (toluene diisocyantes)
53	Toxaphene	8001-35-2	1.20E+00	OEHHA	--	--	--	--	--	--
54	1,1,1-Trichloroethane	71-55-6	--	--	--	--	--	--	1.00E+03	OEHHA
55	2,4,6-Trichlorophenol	88-06-2	7.00E-02	OEHHA	2.00E-05	OEHHA	--	--	--	--
56	Vinyl chloride	75-01-4	--	--	7.80E-05	OEHHA	--	--	--	--

FOOTNOTES:

CAS = Chemical Abstracts Service

CSFo = oral cancer slope factor

IUR = inhalation unit risk factor

OEHHA = California Office of Environmental Health Hazard Assessment

PHG = Public Health Goal

RfD = chronic oral referen

REL = chronic reference exposure level

WHO-05 TEF = 2005 World Health Organization, Toxicity Equivalency Factor

	Table B		Non-Cancer Health-Hazard Values	
Line #	Analyte	CAS Registry Number	Benchmark Incremental Change in Blood Lead (µg/dL)	Reference
1	Lead and compounds[#]	7439-92-1	1.0	OEHHA

FOOTNOTES:

[#] The toxicity criterion for lead represents a benchmark incremental change in blood lead concentration. The units are in microgram per deciliter (µg/dL).

CAS = Chemical Abstracts Service

OEHHA = California Office of Environmental Health Hazard Assessment