Appendix 2C
Suburban Residential Based Cleanup Values

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APPENDIX 2C

Suburban Residential Based Cleanup Values

NASA Supplemental EIS for Soil Cleanup Activities, SSFL, Ventura, California

Data Grouping	Parameter Name	Screening Level - HHRA Soil[f]	Units	Screening Level - ERA Soil[f]	Units
Aroclors	Aroclor 1016 [a]	3,800	µg/kg	1,200	µg/kg
Aroclors	Aroclor 1242 [a]	220	µg/kg	430	µg/kg
Aroclors	Aroclor 1248 [a]	220	µg/kg	64	µg/kg
Aroclors	Aroclor 1254 [a]	220	µg/kg	390	µg/kg
Aroclors	Aroclor 1260 [a]	230	µg/kg	250	µg/kg
Aroclors	Aroclor 5460 [a]	220	µg/kg	410	µg/kg
Dioxins and Furans	DIOXINTEQM [b,c]	4.7	pg/g	5	pg/g
General Chemistry	Cyanide	23	mg/kg	1.8	mg/kg
General Chemistry	Fluoride	3,000	mg/kg	Not applicable	Not applicable
General Chemistry	Nitrogen, Nitrate (as N)	Not applicable	Not applicable	5,200	mg/kg
General Chemistry	O-Phosphate (as P)	Not applicable	Not applicable	0.35	mg/kg
Herbicides	Pentachlorophenol	960	µg/kg	10,000	µg/kg
Metals	Aluminum	75,000	mg/kg	58,600 [e]	mg/kg
Metals	Antimony	26	mg/kg	24	mg/kg
Metals	Arsenic	46 [e]	mg/kg	74	mg/kg
Metals	Barium	11,000	mg/kg	1,410	mg/kg
Metals	Beryllium	3	mg/kg	42	mg/kg
Metals	Boron	15,000	mg/kg	100	mg/kg
Metals	Cadmium	5.2	mg/kg	0.7 [e]	mg/kg
Metals	Calcium	Not applicable	Not applicable	23	mg/kg
Metals	Chromium	36,000	mg/kg	330	mg/kg
Metals	Chromium VI	2 [e]	mg/kg	30	mg/kg
Metals	Cobalt	44 [e]	mg/kg	850	mg/kg
Metals	Copper	3,000	mg/kg	420	mg/kg
Metals	Lead	80	mg/kg	49 [e]	mg/kg
Metals	Lithium	150	mg/kg	170	mg/kg
Metals	Manganese	1,120 [e]	mg/kg	10,500	mg/kg
Metals	Mercury	8.8	mg/kg	0.29	mg/kg
Metals	Molybdenum	380	mg/kg	3.9	mg/kg
Metals	Nickel	490	mg/kg	132 [e]	mg/kg
Metals	Potassium	Not applicable	Not applicable	Not applicable	Not applicable
Metals	Selenium	380	mg/kg	7.2	mg/kg
Metals	Silver	230	mg/kg	220	mg/kg
Metals	Sodium	Not applicable	Not applicable	Not applicable	Not applicable
Metals	Strontium	46,000	mg/kg	1010	mg/kg
Metals	Thallium	1.2 [e]	mg/kg	12	mg/kg
Metals	Titanium	Not applicable	Not applicable	73	mg/kg
Metals	Vanadium	180	mg/kg	175 [e]	mg/kg
Metals	Zinc	23,000	mg/kg	215 [e]	mg/kg
Metals	Zirconium	19 [c]	mg/kg	Not applicable	Not applicable
Pesticides	Aldrin	34	µg/kg	570	µg/kg
Pesticides	Alpha- BHC	95	µg/kg	2,900	µg/kg
Pesticides	Beta- BHC	330	µg/kg	2,900	µg/kg
Pesticides	Chlordane	440	µg/kg	5,600	µg/kg
Pesticides	Delta- BHC	Not applicable	µg/kg	Not applicable	µg/kg
Pesticides	Dieldrin	37	µg/kg	400	µg/kg
Pesticides	Endosulfan I	410,000	µg/kg	4,200	µg/kg
Pesticides	Endosulfan Sulfate	410,000	µg/kg	4,400	µg/kg
Pesticides	Endrin	20,000	µg/kg	79	µg/kg
Pesticides	Endrin Aldehyde	20,000	µg/kg	92	µg/kg
Pesticides	Endrin Ketone	20,000	µg/kg	86	µg/kg
Pesticides	Gamma- BHC (Lindane)	540	µg/kg	5,600	µg/kg

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Pesticides	Heptachlor	120	µg/kg	3,600	µg/kg
Pesticides	Heptachlor Epoxide	61	µg/kg	6.5	µg/kg
Pesticides	Methoxychlor	340,000	µg/kg	50,000	µg/kg
Pesticides	p,p- DDD	2,500	µg/kg	850	µg/kg
Pesticides	p,p- DDE	1,700	µg/kg	280	µg/kg
Pesticides	p,p- DDT	1,800	µg/kg	580	µg/kg
Phthalates	Bis(2- ethylhexyl)phthalate	38,000	µg/kg	65,000	µg/kg
Phthalates	Butyl benzyl phthalate	280,000	µg/kg	260,000	µg/kg
Phthalates	Di- n- butyl phthalate	6,100,000	µg/kg	1,100	µg/kg
Phthalates	Di- n- octyl phthalate	610,000	µg/kg	130,000	µg/kg
Phthalates	Diethyl phthalate	49,000,000	µg/kg	23,000	µg/kg
Phthalates	Dimethyl phthalate	49,000,000	µg/kg	45,000	µg/kg
Polycyclic Aromatic Hydrocarbon	1- Methylnaphthalene	16,000	µg/kg	260,000	µg/kg
Polycyclic Aromatic Hydrocarbon	2- Methylnaphthalene	220,000	µg/kg	260,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Acenaphthene	3,300,000	µg/kg	12,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Acenaphthylene	3,300,000	µg/kg	3,300	µg/kg
Polycyclic Aromatic Hydrocarbon	Anthracene	16,000,000	µg/kg	25,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Benzo(a)anthracene	1,000	µg/kg	180,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Benzo(a)pyrene	110	µg/kg	240,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Benzo(b)fluoranthene	1,100	µg/kg	120,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Benzo(e)pyrene	1,600,000	µg/kg	120,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Benzo(ghi)perylene	1,600,000	µg/kg	110,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Benzo(k)fluoranthene	11,000	µg/kg	120,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Chrysene	110,000	µg/kg	130,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Dibenzo(ah)anthracene	110	µg/kg	140,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Fluoranthene	2,200,000	µg/kg	930,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Fluorene	2,200,000	µg/kg	5,400	µg/kg
Polycyclic Aromatic Hydrocarbon	Indeno(1,2,3- cd)pyrene	1,100	µg/kg	120,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Naphthalene	1,900	µg/kg	130,000	µg/kg
Polycyclic Aromatic Hydrocarbon	PAHTEQM [d]	110	µg/kg	Not applicable	Not applicable
Polycyclic Aromatic Hydrocarbon	Perylene	1,600,000	µg/kg	220,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Phenanthrene	16,000,000	µg/kg	28,000	µg/kg
Polycyclic Aromatic Hydrocarbon	Pyrene	1,600,000	µg/kg	140,000	µg/kg
Semivolatile Organic Compound	2- Chloronaphthalene	4,900,000	µg/kg	Not applicable	Not applicable
Semivolatile Organic Compound	2- Methylphenol	3,000,000	µg/kg	Not applicable	Not applicable
Semivolatile Organic Compound	2,4- Dimethylphenol	1,200,000	µg/kg	330,000	µg/kg
Semivolatile Organic Compound	2,5- Dimethylfuran	9,300	µg/kg	Not applicable	Not applicable
Semivolatile Organic Compound	2,6- bis(1,1- dimethylethyl)- 4- methylphenol	150,000	µg/kg	Not applicable	Not applicable
Semivolatile Organic Compound	3,5- Dimethylphenol	61,000	µg/kg	26,000	µg/kg
Semivolatile Organic Compound	3+4- Methylphenol	6,100,000	µg/kg	Not applicable	Not applicable
Semivolatile Organic Compound	4- Methylphenol	6,100,000	µg/kg	43,000	µg/kg
Semivolatile Organic Compound	Benzoic acid	240,000,000	µg/kg	45,000	µg/kg
Semivolatile Organic Compound	Benzyl alcohol	6,100,000	µg/kg	45,000	µg/kg
Semivolatile Organic Compound	Carbazole	6,100,000	µg/kg	15,000	µg/kg
Semivolatile Organic Compound	Cresyl diphenylphosphate	1,200,000	µg/kg	Not applicable	Not applicable
Semivolatile Organic Compound	Dibenzofuran	72,000	µg/kg	Not applicable	Not applicable
Semivolatile Organic Compound	n- Nitrosodimethylamine	58,000	µg/kg	79,000	µg/kg
Semivolatile Organic Compound	n- Nitrosodiphenylamine	58,000	µg/kg	28,000	µg/kg
Semivolatile Organic Compound	Phenol	18,000,000	µg/kg	51,000	µg/kg
Semivolatile Organic Compound	tert- Butyl alcohol	130,000,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	1,1- Dichloroethane	3,600	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	1,1- Dichloroethene	83,000	µg/kg	18,000	µg/kg

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Volatile Organic Compound	1,1,1- Trichloroethane	1,700,000	µg/kg	6,240,000	µg/kg
Volatile Organic Compound	1,1,2- Trichloro- 1,2,2- trifluoroethane	6,700,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	1,1,2- Trichloroethane	1,100	µg/kg	100,000	µg/kg
Volatile Organic Compound	1,1,2,2- Tetrachloroethane	600	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	1,2- Dibromo- 3- chloropropane	22	µg/kg	1,400	µg/kg
Volatile Organic Compound	1,2- Dibromoethane (EDB)	36	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	1,2- Dichloro- 1,1,2- trifluoroethane	6,700,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	1,2- Dichlorobenzene	1,800,000	µg/kg	130,000	µg/kg
Volatile Organic Compound	1,2- Dichloroethane	460	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	1,2- Dichloroethenes	18,000	µg/kg	250,000	µg/kg
Volatile Organic Compound	1,2- Dichloropropane	1,000	µg/kg	160,000	µg/kg
Volatile Organic Compound	1,2- Dichlorotetrafluoroethane	6,700,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	1,2,3- Trichlorobenzene	40,000	µg/kg	37,000	µg/kg
Volatile Organic Compound	1,2,4- Trichlorobenzene	24,000	µg/kg	37,000	µg/kg
Volatile Organic Compound	1,2,4- Trimethylbenzene	300,000	µg/kg	4,000	µg/kg
Volatile Organic Compound	1,3- Dichlorobenzene	2,600	µg/kg	110,000	µg/kg
Volatile Organic Compound	1,3,5- Trimethylbenzene	270,000	µg/kg	4,100	µg/kg
Volatile Organic Compound	1,4- Dichlorobenzene	2,600	µg/kg	28,000	µg/kg
Volatile Organic Compound	1,4- Dioxane (P- Dioxane)	4,700	µg/kg	4,600	µg/kg
Volatile Organic Compound	2- Butanone (Methyl ethyl ketone)	27,000,000	µg/kg	21,100,000	µg/kg
Volatile Organic Compound	2- Chloro- 1,1,1- trifluoroethane	1,200,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	2- Chloroethyl vinyl ether	20	µg/kg	910,000	µg/kg
Volatile Organic Compound	2- Chlorotoluene	470,000	µg/kg	63,000	µg/kg
Volatile Organic Compound	2- Hexanone	200,000	µg/kg	170,000	µg/kg
Volatile Organic Compound	4- Ethyltonluene	560,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	4- Methyl- 2- pentanone (MIBK)	33,000,000	µg/kg	45,000	µg/kg
Volatile Organic Compound	Acetone	61,000,000	µg/kg	230,000	µg/kg
Volatile Organic Compound	Benzene	330	µg/kg	730,000	µg/kg
Volatile Organic Compound	Benzyl Chloride	1,100	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	Bromobenzene	290,000	µg/kg	43,000	µg/kg
Volatile Organic Compound	Bromodichloromethane	280	µg/kg	51,000	µg/kg
Volatile Organic Compound	Bromoform	18,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	Bromomethane	6,800	µg/kg	16,000	µg/kg
Volatile Organic Compound	Carbon Disulfide	770,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	Carbon tetrachloride	98	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	Chlorobenzene	280,000	µg/kg	43,000	µg/kg
Volatile Organic Compound	Chloroethane	14,000,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	Chloromethane	110,000	µg/kg	16,000	µg/kg
Volatile Organic Compound	Chlorotrifluoroethylene	6,700,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	cis- 1,2- Dichloroethene	18,000	µg/kg	220,000	µg/kg
Volatile Organic Compound	cis- 1,3- Dichloropropene	570	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	Dibromochloromethane	940	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	Dichlorodifluoromethane	87,000	µg/kg	410,000	µg/kg
Volatile Organic Compound	Ethylbenzene	5,800	µg/kg	240,000	µg/kg
Volatile Organic Compound	Formaldehyde	11,000	µg/kg	380,000	µg/kg
Volatile Organic Compound	Hexachlorobutadiene	1,200	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	Isopropanol	5,600,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	Isopropylbenzene	1,900,000	µg/kg	13,000	µg/kg
Volatile Organic Compound	m,p- Xylenes	550,000	µg/kg	4,200	µg/kg
Volatile Organic Compound	Methyl- tert- butyl Ether (MTBE)	47,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	Methylene chloride	11,000	µg/kg	230,000	µg/kg
Volatile Organic Compound	n- butylbenzene	1,200,000	µg/kg	180,000	µg/kg

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Data Grouping	Parameter Name	Screening Level - HHRA Soil[f]	Units	Screening Level - ERA Soil[f]	Units
Volatile Organic Compound	n- Octane	22,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	n- Propylbenzene	3,800,000	µg/kg	220,000	µg/kg
Volatile Organic Compound	o- Xylene	650,000	µg/kg	4,300	µg/kg
Volatile Organic Compound	p- Isopropyltoluene	1,900,000	µg/kg	37,000	µg/kg
Volatile Organic Compound	sec- Butylbenzene	2,200,000	µg/kg	9,800	µg/kg
Volatile Organic Compound	Styrene	5,600,000	µg/kg	420,000	µg/kg
Volatile Organic Compound	tert- Butylbenzene	2,200,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	Tetrachloroethene	590	µg/kg	11,000	µg/kg
Volatile Organic Compound	Toluene	1,100,000	µg/kg	590,000	µg/kg
Volatile Organic Compound	Total 1,2- Dichloroethene	18,000	µg/kg	250,000	µg/kg
Volatile Organic Compound	trans- 1,2- Dichloroethene	130,000	µg/kg	240,000	µg/kg
Volatile Organic Compound	trans- 1,3- Dichloropropene	570	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	Trichloroethene	940	µg/kg	18,000	µg/kg
Volatile Organic Compound	Trichlorofluoromethane	1,200,000	µg/kg	850,000	µg/kg
Volatile Organic Compound	Trichloromethane (Chloroform)	320	µg/kg	190,000	µg/kg
Volatile Organic Compound	Vinyl Acetate	910,000	µg/kg	Not applicable	Not applicable
Volatile Organic Compound	Vinyl chloride	8.2	µg/kg	7,800	µg/kg
Volatile Organic Compound	Xylenes, Total	550,000	µg/kg	4,200	µg/kg

Notes:

[a] Individual PCB coplanars and congeners are not listed in the table as they are accounted for under the Aroclor parameters.

[b] DIOXINTEQM is listed in the LUT as 2,3,7,8-TCDD TEQ.

[c] Individual dioxins and furans congeners included in the TEQ calculation (DIOXINTEQM) are not listed in the table; results were compared against the calculated TEQ, which takes the individual congeners into account.

[d] PAHTEQM is calculated as benzo(a)pyrene TEQ. Benzo(a)pyrene equivalence was developed based on the sum of carcinogenic PAHs. To evaluate benzo(a)pyrene equivalence, carcinogenic PAHs need to meet respective background study MRLs.

[e] Screening value shown reflects the accepted site background concentration and/or Look-up Table (LUT) screening value, which was greater than the risk-based screening value.

[f] Alternative cleanups may implement soil, sediment, and soil gas remedial goals that vary; for the purpose of this document, screening values shown are reduced to soil media.

µg/kg = microgram(s) per kilogram

µg/m^3 = microgram(s) per cubic meter

BHC = hexachlorocyclohexane

DDD = dichlorodiphenyldichloroethane

DDE = dichlorodiphenyldichloroethylene

DDT = dichlorodiphenyltrichloroethane

DIOXINTEQM = dioxins and furans toxic equivalency

ERA = ecological risk assessment

HHRA = human health risk assessment

mg/kg = milligram(s) per kilogram

MRL = method reporting limit

PAHTEQM = PAHs toxic equivalency

PCB = polychlorinated biphenyl

pg/g = picogram(s) per gram

TEQ = toxic equivalence quotient