AEROJET PROPOSED PLAN AND FINAL OU6 BOU ROD TABLES 2-2 AND 2-3 COMPARISON

Table 2-2: Performance Standards for Soil[a]

COC	Residential Soil CL for the Protection of HH (mg/kg)	Industrial Soil CL for the Protection of HH (mg/kg)	Source	Soil CL for the Protection of GW (mg/kg)	Source	Soil CL for the Protection of Ecological Receptors (mg/kg)	Primary Source
1,1,2,2-PCA	~~0.56~~ 0.60	~~2.8~~ 2.7	2015 RSL value update	--	--	--	--
4,4'-DDD	2.2	9.6	2015 RSLvalue added	1.5	DLM value added	0.021	EcoSSL
4,4'-DDE	1.6	6.8	2015 RSLvalue added	1.0	DLM value added	0.021	EcoSSL
4,4'-DDT	1.9	8.6	2015 RSLvalue added	1.0	DLM value added	0.021	EcoSSL
Aluminum	77,000	1,000,000	2015 RSLvalue added	~~43,000~~ 40,976	Background threshold value (UTL95) (RCRB soils)	pH <5.5	EcoSSL
	--	--	--	54,000	Background threshold value (UTL95 and Max) (Xerorthent soils)	--	--
Antimony	~~30~~ 31	~~380~~ 470	2015 RSLvalue update	60	DLM	~~0.27~~ 0.42	~~EcoSSL~~ Updated to Background threshold value (UTL95) (RCRB soils)

Table 2-2: Performance Standards for Soil[a]

COC	Residential Soil CL for the Protection of HH (mg/kg)	Industrial Soil CL for the Protection of HH (mg/kg)	Source	Soil CL for the Protection of GW (mg/kg)	Source	Soil CL for the Protection of Ecological Receptors (mg/kg)	Primary Source
	--	--	--	--	--	0.46	Updated to Background threshold value (UTL95) (Xerorthents soils)
Aroclor-1248	0.24	1.0	2015 RSLvalue added	0.034	DLM	0.0072	LANL
Aroclor-1254	~~0.089~~ 0.24	~~0.3~~ 1.0	~~CHHSL~~ 2015 RSLvalue added	0.034	DLM	0.041	LANL
Aroclor-1260	~~0.089~~ 0.24	~~0.3~~ 1.0	~~CHHSL~~ 2015 RSLvalue added	0.034	DLM	~~0.14~~ 0.88	Updated to latest LANL value
Barium	~~5,200~~ 15,000	~~63,000~~ 220,000	~~CHHSL~~ 2015 RSLvalue added	10,000	DLM	~~110~~ 274	~~EcoSSL~~ Updated to Background threshold value (UTL95) (RCRB soils)
	--	--	--	--	--	320	Updated to Background threshold value (Max) (Xerorthents soils)

Table 2-2: Performance Standards for Soil[a]

COC	Residential Soil CL for the Protection of HH (mg/kg)	Industrial Soil CL for the Protection of HH (mg/kg)	Source	Soil CL for the Protection of GW (mg/kg)	Source	Soil CL for the Protection of Ecological Receptors (mg/kg)	Primary Source
Benzo(a)anthracene	0.15	~~2~~ 2.9	2015 RSLvalue update	0.03	DLM	1.1	EcoSSL/high MW
Benzo(a)pyrene	0.015	~~0.21~~ 0.29	2015 RSLvalue update	0.029	DLM	1.1	EcoSSL/high MW
Benzo(b)fluoranthene	0.15	~~2~~ 2.9	2015 RSLvalue update	0.029	DLM	1.1	EcoSSL/high MW
Benzo(k)fluoranthene	1.5	~~2~~ 29	2015 RSLvalue update	0.29	DLM	1.1	EcoSSL/high MW
Bis(2-ethylhexyl)phthalate	38	160	2015 RSLvalue added	4	DLM value added	0.02	LANL
Boron	2015 RSLvalue added	2015 RSLvalue added	2015 RSLvalue added	140	DLM value added	~~2~~ 19	~~LANL~~ Updated to Mean CA background (Kearney Foundation 1996)

Table 2-2: Performance Standards for Soil[a]

COC	Residential Soil CL for the Protection of HH (mg/kg)	Industrial Soil CL for the Protection of HH (mg/kg)	Source	Soil CL for the Protection of GW (mg/kg)	Source	Soil CL for the Protection of Ecological Receptors (mg/kg)	Primary Source
Cadmium	4.6	6.4	Added from DTSC Note 3	~~0.72~~ 70	~~Background threshold value (RCRB soils)~~ Updated to 2015 RSL	~~0.36~~ 0.72	~~EcoSSL~~ Background threshold value (UTL95) (RCRB soils)
	--	--	--	~~1.2~~	~~Background threshold value (Xerorthent soils)~~	1.2	Background threshold value (Max) (Xerorthent soils)
Chromium	110	110	Added Background threshold value (Max) (RCRB soils)	500	DLM	~~26~~ 110	~~EcoSSL~~ Background threshold value (Max) (RCRB soils)
	118	118	Added Background threshold value (UTL95) (Xerorthent soils)	500	DLM	118	Background threshold value (UTL95) (Xerorthent soils)
Chrysene	15	~~210~~ 290	2015 RSLvalue update	2.9	DLM value added	1.1	EcoSSL/high MW

Table 2-2: Performance Standards for Soil[a]

COC	Residential Soil CL for the Protection of HH (mg/kg)	Industrial Soil CL for the Protection of HH (mg/kg)	Source	Soil CL for the Protection of GW (mg/kg)	Source	Soil CL for the Protection of Ecological Receptors (mg/kg)	Primary Source
Copper	3,100	47,000	2015 RSLvalue added	3,000	DLM value added	~~28~~ 63	~~EcoSSL~~ Background threshold value (UTL95 and Max) (RCRB soils)
	--	--	--	--	--	76	Background threshold value (Max) (Xerorthent soils)
d-BHC	--	--	--	0.2	DLM value added	6.4	Added EPA Region 3 Freshwater Sediment Screening benchmark, 2014
Dibenz(a,h)anthracene	0.015	~~0.21~~ 0.29	2015 RSLvalue update	0.009	DLM value added	1.1	EcoSSL/high MW
Dieldrin	0.033	0.14	2015 RSLvalue update	0.002	DLM value added	0.0049	EcoSSL
Dimethyl phthalate	--	--	--	313,000	DLM value added	10	LANL
Di-n-butyl phthalate	6,200	82,000	2015 RSLvalue added	700	DLM value added	0.011	LANL
Di-n-octyl phthalate	620	8,200	2015 RSLvalue added	--	--	0.91	LANL

Table 2-2: Performance Standards for Soil[a]

COC	Residential Soil CL for the Protection of HH (mg/kg)	Industrial Soil CL for the Protection of HH (mg/kg)	Source	Soil CL for the Protection of GW (mg/kg)	Source	Soil CL for the Protection of Ecological Receptors (mg/kg)	Primary Source
Endrin	18	250	2015 RSLvalue added	1.8	DLM value added	0.0014	LANL
Endrin aldehyde[b]	18	250	2015 RSLvalue added	1.8	DLM value added	0.0014	LANL
Hexavalent chromium	~~0.30~~ 0.29	~~6.3~~ 5.6	2015 RSLvalue update	0.2	Background threshold value	0.34	LANL
Indeno(1,2,3-c,d)pyrene	0.15	~~2.1~~ 2.9	2015 RSLvalue update	0.029	DLM value added	1.1	EcoSSL/high MW
Iron	55,000	~~720,000~~ 820,000	2015 RSLvalue update	42,000	Added Background threshold value (RCRB and Xerorthents soils)	pH<5.0	EcoSSL
Lead	80	320	~~CHHSL~~ DTSC HHRA Note 3	42	Background threshold (UTL95 and Max) value (RCRB soils)	~~11~~ 42	~~EcoSSL~~ Background threshold value (UTL95 and Max) (RCRB soils)
	80	320	~~CHHSL~~ DTSC HHRA Note 3	23	Background threshold (UTL95) value (Xerorthent soils)	~~11~~ 23	~~EcoSSL~~ Background threshold value (UTL95) (Xerorthent soils)
Manganese	1,800	26,000	2015 RSLvalue added	1,100	Background threshold value (Max) (RCRB soils)	~~220~~ 1,100	~~EcoSSL~~ Background threshold value (Max) (RCRB soils)

Table 2-2: Performance Standards for Soil[a]

COC	Residential Soil CL for the Protection of HH (mg/kg)	Industrial Soil CL for the Protection of HH (mg/kg)	Source	Soil CL for the Protection of GW (mg/kg)	Source	Soil CL for the Protection of Ecological Receptors (mg/kg)	Primary Source
	--	--	--	1,500	Background threshold value (UTL95 and Max) (Xerorthent soils)	~~220~~ 1,500	~~EcoSSL~~ Background threshold value (UTL95 and Max) (Xerorthent soils)
Mercury	~~10~~ 9.4	~~43~~ 40	2015 RSLvalue update	1.2	DLM value added	~~0.013~~ 0.87	~~LANL~~ Background threshold value (UTL95) (RCRB soils)
	--	--	--	--	--	0.13	Background threshold value (UTL95) (Xerorthent soils)
Molybdenum	390	5,800	2015 RSLvalue added	350	DLM value added	~~0.4~~ 0.52	~~ORNL~~ Background threshold value (UTL95) (RCRB soils)
	--	--	--	--	--	0.63	Background threshold value (UTL95) (Xerorthent soils)
Naphthalene	3.8	17	2015 RSLvalue added	0.140	DLM	29	EcoSSL/low MW
NDMA	0.0023	0.045	2015 RSLvalue added	0.00003	DLM	--	--

Table 2-2: Performance Standards for Soil[a]

COC	Residential Soil CL for the Protection of HH (mg/kg)	Industrial Soil CL for the Protection of HH (mg/kg)	Source	Soil CL for the Protection of GW (mg/kg)	Source	Soil CL for the Protection of Ecological Receptors (mg/kg)	Primary Source
Nickel	1,500	26,000	2015 RSLvalue update	120	DLM	~~38~~ 75	~~EcoSSL~~ Background threshold value (Max) (RCRB soils)
	--	--	--	140	Background threshold value (UTL95 and Max) (Xerorthent soils)	~~38~~ 140	~~EcoSSL~~ Background threshold value (UTL95 and Max) (Xerorthent soils)
PCE	0.55	2.6	Added Cal-mod RSL	--	--	0.18	LANL
Perchlorate	0.060	820	2015 RSLvalue added – See Appendix F	0.06	DLM	0.61 (surface soil) ~~1.17~~ 20.3 (subsurface soil)	Back-calculated Updated value for subsurface soil
Phenanthrene	--	--	--	--	--	29	EcoSSL/low MW
Phenol	18,000	250,000	2015 RSLvalue added	1	DLM value added	~~0.03~~ 30	ORNL updated value
Prowl (Pendimethylin)	2,500	33,000	2015 RSLvalue added	280	DLM value added	~~1.285~~ 0.624	EcoSSL updated value

Table 2-2: Performance Standards for Soil[a]

COC	Residential Soil CL for the Protection of HH (mg/kg)	Industrial Soil CL for the Protection of HH (mg/kg)	Source	Soil CL for the Protection of GW (mg/kg)	Source	Soil CL for the Protection of Ecological Receptors (mg/kg)	Primary Source
Selenium[d]	6.57	6.57	Added Background threshold value (both RCRB and Xerorthents soils)	300	DLM value added	~~0.52~~ 6.57	~~EcoSSL~~ Background threshold value (both RCRB and Xerorthents soils)
Silver	390	5,800	2015 RSLvalue added	1,000	DLM value added	4.2	EcoSSL
TCE	0.94	6.0	2015 RSLvalue added	--	--	42	LANL
Thallium	0.78	12	2015 RSLvalue added	2,000	DLM value added	1	EcoSSL
Toluene	4,900	47,000	2015 RSLvalue added	150	DLM value added	23	LANL
TPH-D	--	--	--	100	DLM	--	--
TPH-Mo	--	--	--	500	DLM	--	--
Zinc	23,000	350,000	2015 RSLvalue added	50,000	DLM value added	~~46~~ 100	~~EcoSSL~~ Background threshold value (Max) (RCRB soils)

Table 2-2: Performance Standards for Soil[a]

COC	Residential Soil CL for the Protection of HH (mg/kg)	Industrial Soil CL for the Protection of HH (mg/kg)	Source	Soil CL for the Protection of GW (mg/kg)	Source	Soil CL for the Protection of Ecological Receptors (mg/kg)	Primary Source
	--	--	--	--	--	89	Background threshold value (UTL95 and Max) (Xerorthent soils)

Background soil notes:

Xerorthent soils = These soil types are found in areas of dredge tailings near the American River. The soils formed in material that has a high content of gravels and cobbles derived from mixed rock sources. The material was deposited as tailings during mining activities with slopes ranging from 0 to 50 percent.

RCRB soils = Redding-Corning-Red Bluff soils. Moderately well drained soils that are moderately deep over a cemented hard pan. This unit is found on intermediate and high terraces, terrace remnants, and the side slopes of terraces in the eastern part of Sacramento County. The soils form in alluvium that is derived from mixed rock sources. For more details on Xerorthent or RCRB soil types, see the OU-6 RI/FS Report (Shaw, 2012).

Notes:

[a] The soil cleanup levels for protection of human health and ecological receptors also apply to sediments in those areas where a remedial action is being taken.

[b] Endrin used as a surrogate for endrin aldehyde.

[c] Perchlorate exposure through the home-gardening pathway (EPA, 2012) (See Appendix F)

[d] Additional analysis conducted for Selenium by Aerojet in 2014

-- = No COCs were identified that posed a risk for this pathway.

CL = cleanup level
COC = contaminant of concern
DLM = designated level methodology (*Designated Level Methodology for Waste Classification and Cleanup Level Determination* [RWQCB, 1989])
DTSC HHRA Note 3= California Department of Toxic Substances Control, Human Health Risk Assessment Note 3, July 14, 2014
EcoSSL = ecological soil screening levels (White Paper – Ecological Risk Assessment [Aerojet, 2012])
GW = groundwater
HH = human health
LANL = Los Alamos National Laboratory
Max = Maximum detected value from Appendix C – Concentrations in Background Soils, BOU Final RI (ERM-West, 2010)
mg/kg = milligrams per kilogram
MW = molecular weight
ORNL = Oak Ridge National Laboratory
RCRB = Redding-Corning-Red Bluff
RSL = Regional Screening Level (EPA, January 2015)
UTL95 = Upper threshold limit (95th percentile) value from Appendix C – Concentrations in Background Soils, BOU RI (ERM-West, 2010)

Table 2-3: Performance Standards for Soil Vapor in Ambient Air

COC	Residential Use CL ($\mu g/m^3$)	Risk Basis	Industrial Use CL ($\mu g/m^3$)	Risk Basis
Benzene	~~0.31~~ 0.084	~~Cancer 10^{-6} risk level~~ DTSC HHRA Note 3 July 2014	~~1.6~~ 0.42	~~Cancer 10^{-6} risk level~~ DTSC HHRA Note 3 July 2014
Chloroform	~~0.11~~ 0.12	Cancer 10^{-6} risk level	0.53	Cancer 10^{-6} risk level
1,1-Dichloroethene Added to COC list	73	DTSC HHRA Note 3 July 2014	310	DTSC HHRA Note 3 July 2014
cis-1,2-Dichloroethene	~~36.5~~ 7.3	~~Non-cancer~~ DTSC HHRA Note 3 July 2014	~~51~~ 31	~~Non-cancer~~ DTSC HHRA Note 3 July 2014
1,2-Dichloroethane	~~0.094~~ 0.11	Updated Cancer 10^{-6} risk level	0.47	Cancer 10^{-6} risk level
~~1,1,1-Trichloroethene~~ Removed from COC list based on new published screening values	~~5,200~~	~~Non-cancer~~	~~22,000~~	~~Non-cancer~~
Toluene	310	Added DTSC HHRA Note 3 July 2014	1,300	Added DTSC HHRA Note 3 July 2014
Trichloroethene	~~0.43~~ 0.48	Updated Cancer 10^{-6} risk level	3	Cancer 10^{-6} risk level
Tetrachloroethene	0.41	~~Cancer 10^{-6} risk level~~ DTSC HHRA note 3 July 2014	~~2.1~~ 2.08	~~Cancer 10^{-6} risk level~~ DTSC HHRA note 3 July 2014

Table 2-3: Performance Standards for Soil Vapor in Ambient Air

COC	Residential Use CL ($\mu g/m^3$)	Risk Basis	Industrial Use CL ($\mu g/m^3$)	Risk Basis
Vinyl chloride	~~0.16~~ 0.031	~~Cancer 10^{-6} risk level~~ DTSC HHRA note 3 July 2014	~~2.8~~ 0.16	~~Cancer 10^{-6} risk level~~ DTSC HHRA Note 3 July 2014

Notes:

Protective soil vapor levels in subsurface soil are decreased by location- and depth-specific attenuation factors.

DTSC Note 3 regarding modified Air RSLs, July 14, 2014

$\mu g/m^3$ = microgram(s) per cubic meter

CL = cleanup level