

TABLE 5-7
Risk Screening Evaluation for Contaminants in Surface Soil
Bellows OU1 EE/CA, Bellows AFS, Hawaii

Chemical Name	Chemical Group	Chemical Intake (mg/kg-day)																	Chemical-Specific HI		Chemical-Specific ILCR					
		Concentration in Soil (mg/kg)	Concentration in Air (mg/m ³)	Dermal Absorption Factor	Dermal Contact			Inhalation RfD (mg/kg-day)	Oral RfD (mg/kg-day)	Inhalation RfD (mg/kg-day)	Oral SF (kg-day/mg)	Inhalation SF (kg-day/mg)	Ingestion HQ	Inhalation HQ	Dermal HQ	Ingestion ILCR	Inhalation ILCR	Dermal ILCR	Value	% Contrib.	Value	% Contrib.				
					Ingestion (non-carcinogen exposure)	Inhalation (non-carcinogen exposure)	(non-carcinogen exposure)																			
TPH-Diesel	TPH	1.64E+01	1.24E-08	0.1	8.02E-06	2.43E-09	6.42E-06	2.87E-06	8.68E-10	2.29E-06	8.00E-02	--	--	--	1.00E-04	--	8.02E-05	--	--	1.81E-04	0.07	--	--			
Bis (2-ethylhexyl) phthalate	SVOC	9.08E-01	6.88E-10	0.1	4.44E-07	1.35E-10	3.56E-07	1.59E-07	4.81E-11	1.27E-07	2.00E-02	--	1.40E-02	--	2.22E-05	--	1.78E-05	2.22E-09	--	1.78E-09	4.00E-05	0.02	4.00E-09	0.04		
Butyl benzylphthalate	SVOC	4.52E-02	3.42E-11	0.1	2.21E-08	6.70E-12	1.77E-08	7.90E-09	2.39E-12	6.32E-09	2.00E-01	--	--	--	1.11E-07	--	8.84E-08	--	--	1.99E-07	<0.01	--	--			
Diethyl phthalate	SVOC	5.41E-02	4.10E-11	0.1	2.65E-08	8.02E-12	2.12E-08	9.45E-09	2.86E-12	7.56E-09	8.00E-01	--	--	--	3.31E-08	--	2.65E-08	--	--	5.95E-08	<0.01	--	--			
Di-n-butylphthalate	SVOC	1.40E-01	1.06E-10	0.1	6.85E-08	2.08E-11	5.48E-08	2.45E-08	7.41E-12	1.96E-08	1.00E-01	--	--	--	6.85E-07	--	5.48E-07	--	--	1.23E-06	<0.01	--	--			
Di-n-octylphthalate	SVOC	2.19E-02	1.66E-11	0.1	1.07E-08	3.24E-12	8.56E-09	3.82E-09	1.16E-12	3.06E-09	2.00E-02	--	--	--	5.35E-07	--	4.28E-07	--	--	--	--	--	--			
4,4'-DDD	PEST	1.42E-02	1.07E-11	0.03	6.94E-09	2.10E-12	1.67E-09	2.48E-09	7.51E-13	5.95E-10	--	--	2.40E-01	--	--	--	5.95E-10	--	1.43E-10	--	--	7.37E-10	0.01			
4,4'-DDE	PEST	1.29E-01	9.77E-11	0.03	6.31E-08	1.91E-11	1.51E-08	2.25E-08	6.83E-12	5.41E-09	--	--	3.40E-01	--	--	--	7.66E-09	--	1.84E-09	--	--	9.50E-09	0.09			
4,4'-DDT	PEST	9.26E-02	7.01E-11	0.03	4.53E-08	1.37E-11	1.09E-08	1.62E-08	4.90E-12	3.88E-09	5.00E-04	--	3.40E-01	3.40E-01	9.06E-05	--	2.17E-05	5.50E-09	4.67E-12	1.32E-09	1.12E-04	0.05	6.82E-09	0.06		
Aldrin	PEST	1.26E-02	9.52E-12	0.1	6.15E-09	1.86E-12	4.92E-09	2.20E-09	6.65E-13	1.76E-09	3.00E-05	--	1.70E+01	1.72E+01	2.05E-04	--	1.64E-04	3.73E-08	3.20E-11	2.99E-08	3.69E-04	0.15	6.72E-08	0.60		
alpha-BHC	PEST	1.36E-03	1.03E-12	0.04	6.66E-10	2.02E-13	2.13E-10	2.38E-10	7.21E-14	7.62E-11	--	--	6.30E+00	6.30E+00	--	--	1.50E-09	1.27E-12	4.80E-10	--	--	1.98E-09	0.02			
beta-BHC	PEST	1.38E-02	1.04E-11	0.04	6.75E-09	2.04E-12	2.16E-09	2.41E-09	7.30E-13	7.71E-10	--	--	1.80E+00	1.86E+00	--	--	4.34E-09	3.80E-12	1.39E-09	--	--	5.73E-09	0.05			
Chlordane (Alpha)	PEST	3.41E-03	2.59E-12	0.04	1.67E-09	5.06E-13	5.34E-10	5.96E-10	1.81E-13	1.91E-10	6.00E-05	--	1.30E+00	1.30E+00	2.78E-05	--	8.90E-06	7.75E-10	6.58E-13	2.48E-10	3.67E-05	0.02	1.02E-09	0.01		
Chlordane (Gamma)	PEST	2.36E-03	1.79E-12	0.04	1.15E-09	3.50E-13	3.70E-10	4.12E-10	1.25E-13	1.32E-10	6.00E-05	--	1.30E+00	1.30E+00	1.92E-05	--	6.16E-06	5.36E-10	4.55E-13	1.72E-10	2.54E-05	0.01	7.08E-10	0.01		
delta-BHC	PEST	2.51E-03	1.90E-12	0.04	1.23E-09	3.72E-13	3.92E-10	4.38E-10	1.33E-13	1.40E-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Dieldrin	PEST	2.00E-03	1.52E-12	0.1	9.78E-10	2.97E-13	7.83E-10	3.49E-10	1.06E-13	2.80E-10	5.00E-05	--	1.60E+01	1.60E+01	1.96E-05	--	1.57E-05	5.59E-09	4.74E-12	4.47E-09	3.52E-05	0.01	1.01E-08	0.09		
Endosulfan I	PEST	1.59E-03	1.20E-12	0.1	7.76E-10	2.35E-13	6.21E-10	2.77E-10	8.40E-14	2.22E-10	6.00E-03	--	--	--	1.29E-07	--	1.03E-07	--	--	--	2.33E-07	<0.01	--	--		
Endosulfan II	PEST	4.34E-03	3.29E-12	0.1	2.12E-09	6.43E-13	1.70E-09	7.58E-10	2.30E-13	6.06E-10	6.00E-03	--	--	--	3.54E-07	--	2.83E-07	--	--	--	6.37E-07	<0.01	--	--		
Endosulfan sulfate	PEST	6.84E-03	5.18E-12	0.1	3.35E-09	1.01E-12	2.68E-09	1.20E-09	3.62E-13	9.57E-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
Endrin	PEST	2.79E-03	2.12E-12	0.1	1.37E-09	4.14E-13	1.09E-09	4.88E-10	1.48E-13	3.91E-10	3.00E-03	--	--	--	4.56E-07	--	3.65E-07	--	--	--	8.20E-07	<0.01	--	--		
Endrin aldehyde	PEST	3.07E-03	2.33E-12	0.1	1.50E-09	4.55E-13	1.20E-09	5.37E-10	1.63E-13	4.29E-10	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
gamma-BHC (Lindane)	PEST	1.77E-03	1.34E-12	0.04	8.68E-10	2.63E-13	2.78E-10	3.10E-10	9.39E-14	9.92E-11	3.00E-04	--	1.30E+00	--	2.89E-06	--	9.26E-07	4.03E-10	--	1.29E-10	3.82E-06	<0.01	5.32E-10	0.00		
Heptachlor	PEST	1.19E-02	9.03E-12	0.10	5.83E-09	1.77E-12	4.66E-09	2.08E-09	6.31E-13	1.67E-09	5.00E-04	--	4.50E+00	4.55E+00	1.17E-05	--	9.33E-06	9.37E-09	8.04E-12	7.50E-09	2.10E-05	<0.01	1.69E-08	0.15		
Heptachlor epoxide	PEST	5.19E-03	3.94E-12	0.10	2.54E-09	7.70E-13	2.03E-09	9.08E-10	2.75E-13	7.26E-10	1.30E-05	--	9.10E+00	9.10E+00	1.95E-04	--	1.56E-04	8.26E-09	7.01E-12	6.61E-09	3.52E-04	0.14	1.49E-08	0.13		
Methoxychlor	PEST	7.67E-03	5.81E-12	0.10	3.75E-09	1.14E-12	3.00E-09	1.34E-09	4.06E-13	1.07E-09	5.00E-03	--	--	--	7.50E-07	--	6.00E-07	--	--	--	1.35E-06	<0.01	--	--		
Aroclor-1016	PCB	1.44E-02	1.09E-11	0.14	7.04E-09	2.13E-12	7.88E-09	2.51E-09	7.62E-13	2.81E-09	7.00E-05	--	--	--	1.01E-04	--	1.13E-04	--	--	--	2.13E-04	0.09	--	--		
Aroclor-1242	PCB	3.21E-01	2.43E-10	0.14	1.57E-07	4.75E-11	1.76E-07	5.60E-08	1.70E-11	6.27E-08	--	--	7.30E-02	--	--	--	4.09E-09	--	4.58E-09	--	--	8.67E-09	0.08	--	--	
Aroclor-1248	PCB	3.22E-01	2.44E-10	0.14	1.58E-07	4.78E-11	1.77E-07	5.63E-08	1.71E-11	6.31E-08	--	--	7.30E-03	--	--	--	4.11E-10	--	4.61E-10	--	--	8.72E-10	0.01	--	--	
Aroclor-1254	PCB	2.59E-02	1.96E-11	0.14	1.27E-08	3.84E-12	1.42E-08	4.52E-09	1.37E-12	5.07E-09	2.00E-05	--	--	--	6.33E-04	--	7.09E-04	--	--	--	1.34E-03	0.55	--	--		
Aroclor-1260	PCB	1.76E-02	1.34E-11	0.14	8.62E-09	2.61E-12	9.66E-09	3.08E-09	9.33E-13	3.45E-09	--	--	7.30E-01	--	--	--	--	2.25E-09	--	2.52E-09	--	--	4.77E-09	0.04		
Acenaphthene	PAH	8.60E-02	6.52E-11	0.13	4.21E-08	1.27E-11	4.38E-08	1.50E-08	4.55E-12	1.56E-08	6.00E-02	--	--	--	7.01E-07	--	7.29E-07	--	--	--	1.43E-06	<0.01	--	--		
Acenaphthylene	PAH	1.50E-02	1.13E-11	0.13	7.32E-09	2.22E-12	7.61E-09	2.61E-09	7.92E-13	2.72E-09	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Anthracene	PAH	4.37E-03	3.31E-12	0.13	2.14E-09	6.47E-13	2.22E-09	7.63E-10	2.31E-13	7.93E-10	3.00E-01	--	--	--	7.12E-09	--	7.40E-09	--	--	--	1.45E-08	<0.01	--	--		
Benzo (a) anthracene	PAH	3.39E-01	2.57E-10	0.13	1.66E-07	5.02E-11	1.72E-07	5.92E-08	1.79E-11	6.15E-08	--	--	7.30E-01	--	--	--	4.32E-08	--	4.49E-08	--	--	8.81E-08	0.79	--	--	
Benzo (a) pyrene	PAH	3.34E-01	2.53E-10	0.13	1.63E-07	4.95E-11	1.70E-07	5.84E-08	1.77E-11	6.07E-08	--	--	7.30E+00	--	--	--	4.26E-07	--	4.43E-07	--	--	8.69E-07	7.79	--	--	
Benzo (b) fluoranthene	PAH	3.61E-01	2.73E-10	0.13	1.77E-07	5.35E-11	1.84E-07	6.31E-08	1.91E-11	6.56E-08	--	--	7.30E-01	--	--	--	4.60E-08	--	4.79E-08	--	--	9.39E-08	0.84	--	--	
Benzo (g,h,i) perylene	PAH	2.70E-01	2.05E-10	0.13	1.32E-07	4.00E-11	1.37E-07	4.72E-08	1.43E-11	4.91E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Benzo (k) fluoranthene	PAH	3.20E-01	2.42E-10	0.13	1.56E-07	4.74E-11	1.63E-07	5.59E-08	1.69E-11	5.81E-08	--	--	7.30E-02	--	--	--	4.08E-09	--	4.24E-09	--	--	8.32E-09	0.07	--	--	
Chrysene	PAH	3.68E-01	2.78E-10	0.13	1.80E-07	5.45E-11	1.87E-07	6.42E-08	1.95E-11	6.68E-08	--	--	7.30E-03	--	--	--	4.69E-10	--	4.88E-10	--	--	9.56E-10	0.01	--	--	
Dibenzo (a,h) anthracene	PAH	1.08E-02	8.17E-12	0.13	5.27E-09	1.60E-12	5.48E-09	1.88E-09	5.71E-13	1.96E-09	--	--	7.30E+00	--	--	--	1.37E-08	--	1.43E-08	--	--	2.80E-08	0.25	--	--	
Fluoranthene	PAH	3.86E-01	2.93E-10	0.13	1.89E-07	5.73E-11	1.97E-07	6.75E-08	2.05E-11	7.02E-08	4.00E-02	--	--	--	4.73E-06	--	4.92E-06	--	--	--	9.64E-06	<0.01	--	--		
Fluorene	PAH	1.30E-01	9.85E-11	0.13	6.36E-08	1.93E-11	6.61E-08	2.27E-08	6.88E-12	2.36E-08	4.00E-02	--	--	--	1.59E-06	--	1.65E-06	--	--	--	3.24E-06	<0.01	--	--		
Indeno (1,2,3-c,d) pyrene	PAH	3.53E-01	2.67E-10	0.13	1.72E-07	5.23E-11	1.79E-07	6.16E-08	1.87E-11	6.41E-08	--	--	7.30E-01	--	--	--	--	4.50E-08	--	4.68E-08	--	--	9.17E-08	0.82	--	--
Phenanthrene	PAH	3.50E-01	2.65E-10	0.13	1.71E-07	5.19E-11	1.78E-07	6.12E-08	1.85E-11	6.36E-08	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Pyrene	PAH	3.78E-01	2.87E-10	0.13	1.85E-07	5.61E-11	1.93E-07	6.61E-08	2.00E-11	6.88E-08	3.00E-02	--	--	--	6.17E-06	--	6.42E-06	--	--	--	1.26E-05	<0.01	--	--		
Aluminum	METALS	1.46E+04	1.11E-05	0.01	7.14E-03	2.16E-06	5.71E-04	2.55E-03	7.73E-07	2.04E-04	1.00E+00	--	--	--	7.14E-03	--	5.71E-04	--	--	--	7.72E-03	3.16	--	--		
Antimony	METALS	3.42E+01	2.59E-08	0.01	1.67E-05	5.07E-09	1.34E-06	5.98E-06	1.81E-09	4.78E-07	4.00E-04	--	--	--	4.19E-02	--	3.35E-03	--	--	--	4.52E-02	18.55	--	--		
Arsenic	METALS	2.94E+01	2.22E-08	0.03	1.44E-05	4.35E-09	3.45E-06	5.13E-06	1.55E-09	1.23E-06	3.00E-04	--	1.50E+00	1.51E+01	4.79E-02	--	1.15E-02	7.70E-06	6.57E-08							

TABLE 5-7
Risk Screening Evaluation for Contaminants in Surface Soil
Bellows OU1 EE/CA, Bellows AFS, Hawaii

Chemical Name	Chemical Group	Concentration in Soil (mg/kg)	Concentration in Air (mg/m ³)	Dermal Absorption Factor	Chemical Intake (mg/kg-day)										Chemical-Specific HI		Chemical-Specific ILCR									
					Dermal Contact			Ingestion (non-carcinogen exposure)	Inhalation (non-carcinogen exposure)	Ingestion (carcinogen exposure)	Inhalation (carcinogen exposure)	Dermal Contact (carcinogen exposure)	Oral RfD (mg/kg-day)	Inhalation RfD (mg/kg-day)	Oral SF (kg-day/mg)	Inhalation SF (kg-day/mg)	Ingestion HQ	Inhalation HQ	Dermal HQ	Ingestion ILCR	Inhalation ILCR	Dermal ILCR	Value	% Contrib.	Value	% Contrib.
					Ingestion (non-carcinogen exposure)	Inhalation (non-carcinogen exposure)	Dermal Contact (carcinogen exposure)																			
MCPA	HERB	4.41E+00	3.34E-09	0.1	2.16E-06	6.53E-10	1.72E-06	7.70E-07	2.33E-10	6.16E-07	5.00E-04	--	--	--	4.31E-03	--	3.45E-03	--	--	--	7.76E-03	3.18	--	--		
MCPP	HERB	1.83E+00	1.39E-09	0.1	8.97E-07	2.72E-10	7.18E-07	3.20E-07	9.71E-11	2.56E-07	1.00E-03	--	--	--	8.97E-04	--	7.18E-04	--	--	--	1.62E-03	0.66	--	--		
																			2.44E-01		1.11E-05					
																			Total Hazard Index		Total Risk					

EXPOSURE ASSUMPTIONS

Exposure Setting	Onsite Worker
Exposure Case	RME
Soil Ingestion Rate (mg/day)	50
Inhalation Rate (m ³ /day)	20
Particulate Emissions Factor (m ³ /kg)	1.32E+09
Exposed Skin Surface Area (cm ²)	5000
Soil Adherence Factor (mg/cm ²)	0.08
Correction Factor	1.00E-06
Fraction of chemical absorbed (unitless)	chemical-specific
Body Weight (kilograms)	70.0
Number of Days/Year Exposed	250
Number of Years Exposed	25
Averaging Time - Noncancer (yr)	25
Averaging Time - Cancer (yr)	70

Chemical Intake

Ingestion (Noncancer) (d-1)	4.89E-07
Ingestion (Cancer) (d-1)	1.75E-07
Inhalation (Noncancer) (d-1)	1.96E-01
Inhalation (Noncancer) (d-1)	6.99E-02

Absorbed Dose

Dermal (Noncancer) (d-1)	3.91E-06
Dermal (Cancer) (d-1)	1.40E-06

Chemical Groups

TPH = total petroleum hydrocarbons
SVOC = semivolatile organic compounds
PEST = pesticides
PCB = polychlorinated biphenyls
PAH = polynuclear aromatic hydrocarbons
HERB = herbicides

Acronyms

HI = hazard index
HQ = hazard quotient
ILCR = increased lifetime cancer risk
RfD = reference dose
RME = reasonable maximum exposure
SF = slope factor

Units

mg = milligrams
m = meters
cm = centimeters
yr = years
d-1 = per day
kg = kilogram

-- indicator risk calculating factors not available.