APPENDIX D

Human Health Risk Assessment Exposure Assumptions

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TABLE 4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS

Atlantic Wood Industries Superfund Site - OU1

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Industrial Worker	Adult	Onsite Surface Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.1	- -	Chronic Daily Intake (CDI) (mg/kg-day)=
				IR-S	Ingestion Rate of Surface Soil	mg/day	50	EPA, 1991	CS x IR x EF x ED x FI x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	days/year	250	EPA, 1991	
				ED	Exposure Duration	years	25	EPA, 1991	
				FI	Fraction Ingested	unitless	1	Professional Judgment	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	9,125	EPA, 1989	
	Other Worker	Adult	Onsite Surface Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.1	- -	
				IR-S	Ingestion Rate of Surface Soil	mg/day	50	Professional Judgment	
				EF	Exposure Frequency	days/year	250	Professional Judgment	
				ED	Exposure Duration	years	25	Professional Judgment	
				FI	Fraction Ingested	unitless	1	Professional Judgment	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	9,125	EPA, 1989	
	Trespasser/Visitor	Adult	Onsite Surface Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.1	- -	
				IR-S	Ingestion Rate of Soil	mg/day	100	EPA, 1991	
				EF	Exposure Frequency	days/year	52 [2]	Professional Judgment	
				ED	Exposure Duration	years	30	EPA, 1991	
				FI	Fraction Ingested	unitless	1	Professional Judgment	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	10,950	EPA, 1989	
		Child	Onsite Surface Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.1	- -	
				IR-S	Ingestion Rate of Surface Soil	mg/day	200	EPA, 1991	
				EF	Exposure Frequency	days/year	52 [2]	Professional Judgment	
				ED	Exposure Duration	years	6	EPA, 1991	
				FI	Fraction Ingested	unitless	1	Professional Judgment	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				BW	Body Weight	kg	15	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	2,190	EPA, 1989	

TABLE 4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS

Atlantic Wood Industries Superfund Site - OU1

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Dermal	Industrial Worker	Adult	Onsite Surface Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.1	- -	DAD (Dermal Absorbed Dose) (mg/kg-day) =
				DAevent	Absorbed dose per event	mg/cm2 - event	calculated	- -	DAevent x EF x ED x EV x SA / (BW x AT)
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	where
				SA	Skin Surface Area Available for Contact	cm^2	3300 [3]	EPA, 2001	DAevent = CS x CF1 x AF x ABSd
				AF	Soil to Skin Adherence Factor	mg/cm2 - event	0.2 [3]	EPA, 2001	
				ABSd	Dermal Absorption Fraction	unitless	chemical-specific	EPA, 2001	
				EV	Event Frequency	events/day	1 [3]	EPA, 2001	
				EF	Exposure Frequency	days/year	250	EPA, 2001	
				ED	Exposure Duration	years	25	EPA, 2001	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	9,125	EPA, 1989	
	Other Worker	Adult	Onsite Surface Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.1	- -	
				DAevent	Absorbed dose per event	mg/cm2 - event	calculated	- -	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				SA	Skin Surface Area Available for Contact	cm^2	2000 [4]	EPA, 1997	
				AF	Soil to Skin Adherence Factor	mg/cm2 - event	0.03 [5]	EPA, 1997	
				ABSd	Dermal Absorption Fraction	unitless	chemical-specific	EPA, 2001	
				EV	Event Frequency	events/day	1	Professional Judgment	
				EF	Exposure Frequency	days/year	250	Professional Judgment	
				ED	Exposure Duration	years	25	Professional Judgment	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	9,125	EPA, 1989	
	Trespasser/Visitor	Adult	Onsite Surface Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.1	- -	
				DAevent	Absorbed dose per event	mg/cm2 - event	calculated	- -	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				SA	Skin Surface Area Available for Contact	cm^2	5000 [6]	EPA, 1997	
				AF	Soil to Skin Adherence Factor	mg/cm2 - event	0.34 [7]	EPA, 1997	
				ABSd	Dermal Absorption Fraction	unitless	chemical-specific	EPA, 2001	
				EV	Event Frequency	events/day	1	Professional Judgment	
				EF	Exposure Frequency	days/year	52 [2]	Professional Judgment	
				ED	Exposure Duration	years	30	EPA, 1991	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	10,950	EPA, 1989	

TABLE 4.1

VALUES USED FOR DAILY INTAKE CALCULATIONS

Atlantic Wood Industries Superfund Site - OU1

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Surface Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Dermal (cont)		Child	Onsite Surface Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.1	- -	
				DAevent	Absorbed dose per event	mg/cm2 - event	calculated	- -	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				SA	Skin Surface Area Available for Contact	cm^2	3600 [8]	EPA, 1997	
				AF	Soil to Skin Adherence Factor	mg/cm2 - event	0.16 [9]	EPA, 1997	
				ABSd	Dermal Absorption Fraction	unitless	chemical-specific	EPA, 2001	
				EV	Event Frequency	events/day	1	Professional Judgment	
				EF	Exposure Frequency	days/year	52 [2]	Professional Judgment	
				ED	Exposure Duration	years	6	EPA, 1991	
				BW	Body Weight	kg	15	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	2,190	EPA, 1989	

Sources:

EPA, 1989 Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook, Vol. 1. EPA/600/P-95/002Fa.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment. Interim. EPA/540/R/99/005.

Notes.

1. Onsite surface soil includes surface soil samples collected onsite from 0 to 6 inches and sediment samples collected from the eastern and western storm water drainage ditches, with the exception of samples collected from the ABM area and the Acetylene Sludge Area.
2. For RME values, assumes trespassing one hour per day, one day per week for 52 weeks per year.
3. AF, SA, and EV are default values from Exhibit 3-5 (EPA, 2001).
4. The RME skin surface area assumes exposure to hands, forearms, and face and is obtained by averaging both male and female hands, forearm, and face mean values found on Table 6-4 (EPA, 1997).
5. The RME soil to skin adherence factor is from Table 6-12 for average Tae Kwan Do and Greenhouse Workers hands, arms, and face (EPA, 1997). These were the only two activities listed on the tables so an average was taken.
6. The RME skin surface area is obtained from Table 6-14, central tendency surface area for outdoor soil contact (assumes 25% of total surface area) (EPA, 1997).
7. Soil to Skin Adherence Factor calculated from Table 6-12 by averaging hand, arm, leg, and face values for gardeners no. 1 and 2. (No trespasser activity on Table 6-12) (EPA, 1997).
8. The RME skin surface area is for hands, arms, legs, and face (assumes 50% of total surface area) and is obtained by averaging the 50% values of male and female children from age 2 through 7 years found on Table 6-6 and 6-7 and dividing by 2 (EPA, 1997).
9. Soil to Skin Adherence Factor obtained from Table 6-12 for the Soccer No. 1 activity (most conservative) for hands, arms, legs, and face (EPA, 1997).

TABLE 4.2

VALUES USED FOR DAILY INTAKE CALCULATIONS

Atlantic Wood Industries Superfund Site - OU1

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Industrial Worker	Adult	Inhalation of Particulates Onsite (soil to air pathway)[1]	CA	Chemical Concentration in Air	mg/m^3	modeled - See Table 3.2	- -	Chronic Daily Intake (CDI) (mg/kg-day) = CA x IR x ET x EF x ED x 1/BW x 1/AT
				IR	Inhalation Rate	m^3/hour	2.5 [2]	EPA, 1997	
				ET	Exposure Time	hr/day	8 [3]	Professional Judgment	
				EF	Exposure Frequency	days/year	250	EPA,1991	
				ED	Exposure Duration	years	25	EPA,1991	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	days	9,125	EPA, 1989	
	Other Worker	Adult	Inhalation of Particulates Onsite (soil to air pathway)[1]	CA	Chemical Concentration in Air	mg/m^3	modeled- See Table 3.2	- -	
				IR	Inhalation Rate	m^3/hour	1.6 [4]	EPA, 1997	
				ET	Exposure Time	hr/day	8 [3]	Professional Judgment	
				EF	Exposure Frequency	days/year	250	Professional Judgment	
				ED	Exposure Duration	years	25	Professional Judgment	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	days	9,125	EPA, 1989	
			Inhalation of Particulates Offsite (soil to air pathway)[1]	CA	Chemical Concentration in Air	mg/m^3	modeled - See Table 3.3	- -	
				IR	Inhalation Rate	m^3/hour	1.6 [4]	EPA, 1997	
				ET	Exposure Time	hr/day	8 [3]	Professional Judgment	
				EF	Exposure Frequency	days/year	250	EPA,1991	
				ED	Exposure Duration	years	25	EPA,1991	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	days	9,125	EPA, 1989	
	Trespasser/Visitor	Adult	Inhalation of Particulates Onsite (soil to air pathway)[1]	CA	Chemical Concentration in Air	mg/m^3	modeled - See Table 3.2	- -	
				IR	Inhalation Rate	m^3/hour	1.6 [4]	EPA, 1997	
				ET	Exposure Time	hr/day	1 [5]	Professional Judgment	
				EF	Exposure Frequency	days/year	52 [5]	Professional Judgment	
				ED	Exposure Duration	years	30	EPA, 1991	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	days	10,950	EPA, 1989	
		Child	Inhalation of Particulates Onsite (soil to air pathway)[1]	CA	Chemical Concentration in Air	mg/m^3	modeled - See Table 3.2	- -	
				IR	Inhalation Rate	m^3/hour	1.2 [6]	EPA, 1997	
				ET	Exposure Time	hr/day	1 [5]	Professional Judgment	
				EF	Exposure Frequency	days/year	52 [5]	Professional Judgment	
				ED	Exposure Duration	years	6	EPA, 1991	
				BW	Body Weight	kg	15	EPA, 1991	
				AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	

TABLE 4.2

VALUES USED FOR DAILY INTAKE CALCULATIONS

Atlantic Wood Industries Superfund Site - OU1

Scenario Timeframe: Current
Medium: Surface Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

Notes:

1. Onsite surface soil includes surface soil samples collected onsite from 0 to 6 inches and sediment samples collected from the eastern and western storm water drainage ditches, with the exception of samples collected from the ABM area and the Acetylene Sludge Area.
2. Inhalation rates are based on values for the outdoor worker assuming heavy activity for the RME (Table 5-23 of EPA, 1997).
3. Professional Judgment based on activities that would occur 8 hrs per day for the RME.
4. Inhalation rates are based on values for the adult assuming moderate activity for the RME (Table 5-23 of EPA, 1997).
5. For RME values, assumes trespassing one hour per day, one day per week for 52 weeks per year.
6. Inhalation rates are based on child values assuming moderate activity for the RME (Table 5-23 of EPA, 1997).

TABLE 4.3

VALUES USED FOR DAILY INTAKE CALCULATIONS

Atlantic Wood Industries Superfund Site - OU1

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Industrial Worker	Adult	Onsite Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.4	- -	Chronic Daily Intake (CDI) (mg/kg-day)=
				IR-S	Ingestion Rate of Surface Soil	mg/day	50	EPA, 1991	CS x IR x EF x ED x FI x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	days/year	250	EPA, 1991	
				ED	Exposure Duration	years	25	EPA, 1991	
				FI	Fraction ingested	unitless	1	Professional Judgment	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	9,125	EPA, 1989	
	Other Worker	Adult	Onsite Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.4	- -	
				IR-S	Ingestion Rate of Surface Soil	mg/day	50	Professional Judgment	
				EF	Exposure Frequency	days/year	250	Professional Judgment	
				ED	Exposure Duration	years	25	Professional Judgment	
				FI	Fraction Ingested	unitless	1	Professional Judgment	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	9,125	EPA, 1989	
	Trespasser/Visitor	Adult	Onsite Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.4	- -	
				IR-S	Ingestion Rate of Soil	mg/day	100	EPA, 1991	
				EF	Exposure Frequency	days/year	52 [2]	Professional Judgment	
				ED	Exposure Duration	years	30	EPA, 1991	
				FI	Fraction Ingested	unitless	1	Professional Judgment	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	10,950	EPA, 1989	
		Child	Onsite Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.4	- -	
				IR-S	Ingestion Rate of Surface Soil	mg/day	200	EPA, 1991	
				EF	Exposure Frequency	days/year	52 [2]	Professional Judgment	
				ED	Exposure Duration	years	6	EPA, 1991	
				FI	Fraction Ingested	unitless	1	Professional Judgment	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				BW	Body Weight	kg	15	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	2,190	EPA, 1989	

TABLE 4.3

VALUES USED FOR DAILY INTAKE CALCULATIONS

Atlantic Wood Industries Superfund Site - OU1

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Ingestion (cont.)	Construction Worker	Adult	Onsite Soil [1]	CS	Chemical Concentration in Soil	mg/kg	See Table 3.4	- -	
				IR-S	Ingestion Rate of Soil	mg/day	480	EPA, 1991	
				EF	Exposure Frequency	days/year	250	EPA, 1991	
				ED	Exposure Duration	years	0.5	Professional Judgment	
				FI	Fraction Ingested	unitless	1	Professional Judgment	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	183	EPA, 1989	
Dermal	Industrial Worker	Adult	Onsite Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.4	- -	DAD (Dermal Absorbed Dose) (mg/kg-day) =
				DAevent	Absorbed dose per event	mg/cm2 - event	calculated	- -	DAevent x EF x ED x EV x SA / (BW x AT)
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	where
				SA	Skin Surface Area Available for Contact	cm^2	3300 [3]	EPA, 2001	DAevent = CS x CF1 x AF x ABSd
				AF	Soil to Skin Adherence Factor	mg/cm2 - event	0.2 [3]	EPA, 2001	
				ABSd	Dermal Absorption Fraction	unitless	chemical-specific	EPA, 2001	
				EV	Event Frequency	events/day	1 [3]	EPA, 2001	
				EF	Exposure Frequency	days/year	250	EPA, 2001	
				ED	Exposure Duration	years	25	EPA, 2001	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	9,125	EPA, 1989	
	Other Worker	Adult	Onsite Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.4	- -	
				DAevent	Absorbed dose per event	mg/cm2 - event	calculated	- -	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				SA	Skin Surface Area Available for Contact	cm^2	2000 [4]	EPA, 1997	
				AF	Soil to Skin Adherence Factor	mg/cm2 - event	0.03 [5]	EPA, 1997	
				ABSd	Dermal Absorption Fraction	unitless	chemical-specific	EPA, 2001	
				EV	Event Frequency	events/day	1	Professional Judgment	
				EF	Exposure Frequency	days/year	250	Professional Judgment	
				ED	Exposure Duration	years	25	Professional Judgment	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	9,125	EPA, 1989	

TABLE 4.3

VALUES USED FOR DAILY INTAKE CALCULATIONS

Atlantic Wood Industries Superfund Site - OU1

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Dermal (cont.)	Trespasser/Visitor	Adult	Onsite Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.4	- -	
				DAevent	Absorbed dose per event	mg/cm2 - event	calculated	- -	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				SA	Skin Surface Area Available for Contact	cm^2	5000 [6]	EPA, 1997	
				AF	Soil to Skin Adherence Factor	mg/cm2 - event	0.34 [7]	EPA, 1997	
				ABSd	Dermal Absorption Fraction	unitless	chemical-specific	EPA, 2001	
				EV	Event Frequency	events/day	1	Professional Judgment	
				EF	Exposure Frequency	days/year	52 [2]	Professional Judgment	
				ED	Exposure Duration	years	30	EPA, 1991	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	10,950	EPA, 1989	
		Child	Onsite Soil [1]	CS	Chemical Concentration in Surface Soil	mg/kg	See Table 3.4	- -	
				DAevent	Absorbed dose per event	mg/cm2 - event	calculated	- -	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				SA	Skin Surface Area Available for Contact	cm^2	3600 [8]	EPA, 1997	
				AF	Soil to Skin Adherence Factor	mg/cm2 - event	0.16 [9]	EPA, 1997	
				ABSd	Dermal Absorption Fraction	unitless	chemical-specific	EPA, 2001	
				EV	Event Frequency	events/day	1	Professional Judgment	
				EF	Exposure Frequency	days/year	52 [2]	Professional Judgment	
				ED	Exposure Duration	years	6	EPA, 1991	
				BW	Body Weight	kg	15	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	2,190	EPA, 1989	
	Construction Worker	Adult	Onsite Soil [1]	CS	Chemical Concentration in Soil	mg/kg	See Table 3.4	- -	
				DAevent	Absorbed dose per event	mg/cm2 - event	calculated	- -	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	
				AF	Soil to Skin Adherence Factor	mg/cm2 - event	0.43 [10]	EPA, 1997	
				ABSd	Dermal Absorption Fraction	unitless	chemical-specific	EPA, 2001	
				SA	Skin Surface Area Available for Contact	cm^2	5000 [6]	EPA, 1997	
				EV	Event Frequency	events/day	1	Professional Judgment	
				EF	Exposure Frequency	days/year	250	EPA, 1991	
				ED	Exposure Duration	years	0.5	Professional Judgment	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	183	EPA, 1989	

TABLE 4.3

VALUES USED FOR DAILY INTAKE CALCULATIONS

Atlantic Wood Industries Superfund Site - OU1

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Soil

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook, Vol. 1. EPA/600/P-95/002Fa.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment. Interim. EPA/540/R/99/005.

Notes:

1. Onsite soil includes both surface and subsurface soil samples collected onsite and sediment samples collected from the eastern and western drainage ditches, with the exception of samples collected from the ABM area and the Acetylene Sludge Area.
2. For RME values, assumes trespassing one hour per day, one day per week for 52 weeks per year.
3. AF, SA, and EV are default values from Exhibit 3-5 (EPA, 2001).
4. The RME skin surface area assumes exposure to hands, forearms, and face and is obtained by averaging both male and female hand, forearm, and face mean values found on Table 6-4 (EPA, 1997).
5. The RME soil to skin adherence factor is from Table 6-12 for average Tae Kwan Do and Greenhouse Workers hands, arms, and face (EPA, 1997). These were the only two activities listed on the tables so an average was taken.
6. The RME skin surface area is obtained from Table 6-14, central tendency surface area for outdoor soil contact (assumes 25% of total surface area) (EPA, 1997).
7. Soil to Skin Adherence Factor calculated from Table 6-12 by averaging hand, arm, leg, and face values for gardeners no. 1 and 2. (No trespasser activity on Table 6-12) (EPA, 1997).
8. The RME skin surface area is for hands, arms, legs, and face (assumes 50% of total surface area) and is obtained by averaging the 50% values of male and female children from age 2 through 7 years found on Table 6-6 and 6-7 and dividing by 2 (EPA, 1997).
9. Soil to Skin Adherence Factor obtained from Table 6-12 for the Soccer No. 1 activity (most conservative) for hands, arms, legs, and face (EPA, 1997).
10. The RME soil to skin adherence factor is from Table 6-12 for construction worker's hands, arms, legs, and face (EPA, 1997).

TABLE 4.4

VALUES USED FOR DAILY INTAKE CALCULATIONS

Atlantic Wood Industries Superfund Site - OU1

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Inhalation	Industrial Worker	Adult	Inhalation of Particulates Onsite (soil to air pathway)[1]	CA	Chemical Concentration in Air	mg/m^3	modeled - See Table 3.5	- -	Chronic Daily Intake (CDI) (mg/kg-day) = CA x IR x ET x EF x ED x 1/BW x 1/AT
				IR	Inhalation Rate	m^3/hour	2.5 [2]	EPA, 1997	
				ET	Exposure Time	hr/day	8 [3]	Professional Judgment	
				EF	Exposure Frequency	days/year	250	EPA,1991	
				ED	Exposure Duration	years	25	EPA,1991	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	days	9,125	EPA, 1989	
	Other Worker	Adult	Inhalation of Particulates Onsite (soil to air pathway)[1]	CA	Chemical Concentration in Air	mg/m^3	modeled- See Table 3.5	- -	
				IR	Inhalation Rate	m^3/hour	1.6 [4]	EPA, 1997	
				ET	Exposure Time	hr/day	8 [3]	Professional Judgment	
				EF	Exposure Frequency	days/year	250	Professional Judgment	
				ED	Exposure Duration	years	25	Professional Judgment	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	days	9,125	EPA, 1989	
			Inhalation of Particulates Offsite (soil to air pathway)[1]	CA	Chemical Concentration in Air	mg/m^3	modeled - See Table 3.6	- -	
				IR	Inhalation Rate	m^3/hour	1.6 [4]	EPA, 1997	
				ET	Exposure Time	hr/day	8 [3]	Professional Judgment	
				EF	Exposure Frequency	days/year	250	EPA,1991	
				ED	Exposure Duration	years	25	EPA,1991	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	days	9,125	EPA, 1989	
	Trespasser/Visitor	Adult	Inhalation of Particulates Onsite (soil to air pathway)[1]	CA	Chemical Concentration in Air	mg/m^3	modeled- See Table 3.5	- -	
				IR	Inhalation Rate	m^3/hour	1.6 [4]	EPA, 1997	
				ET	Exposure Time	hr/day	1 [5]	Professional Judgment	
				EF	Exposure Frequency	days/year	52 [5]	Professional Judgment	
				ED	Exposure Duration	years	30	EPA, 1991	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	days	10,950	EPA, 1989	
		Child	Inhalation of Particulates Onsite (soil to air pathway)[1]	CA	Chemical Concentration in Air	mg/m^3	modeled- See Table 3.5	- -	
				IR	Inhalation Rate	m^3/hour	1.2 [6]	EPA, 1997	
				ET	Exposure Time	hr/day	1 [5]	Professional Judgment	
				EF	Exposure Frequency	days/year	52 [5]	Professional Judgment	
				ED	Exposure Duration	years	6	EPA, 1991	
				BW	Body Weight	kg	15	EPA, 1991	

TABLE 4.4

VALUES USED FOR DAILY INTAKE CALCULATIONS

Atlantic Wood Industries Superfund Site - OU1

Scenario Timeframe: Future
Medium: Soil
Exposure Medium: Air

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Inhalation (cont.)				AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	days	2,190	EPA, 1989	
	Construction Worker	Adult	Inhalation of Particulates	CA	Chemical Concentration in Air	mg/m^3	modeled - See Table 3.5	- -	
			Onsite (soil to air pathway)[1]	IR	Inhalation Rate	m^3/hour	2.5 [7]	EPA, 1997	
				ET	Exposure Time	hr/day	8	Professional Judgment	
				EF	Exposure Frequency	days/year	250	EPA, 1991	
				ED	Exposure Duration	years	0.5	Professional Judgment	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time (Cancer)	days	25,550	EPA, 1989	
				AT-N	Averaging Time (Non-Cancer)	days	183	EPA, 1989	

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol.1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook. EPA/600/P-95/002Fa.

Notes:

1. Onsite soil includes both surface and subsurface soil samples collected onsite and sediment samples collected from the eastern and western drainage ditches, with the exception of samples collected from the ABM area and the Acetylene Sludge Area.
2. Inhalation rates are based on values for the outdoor worker assuming heavy activity for the RME (Table 5-23 of EPA, 1997).
3. Professional Judgment based on activities that would occur 8 hrs per day for the RME.
4. Inhalation rates are based on values for the adult assuming moderate activity for the RME (Table 5-23 of EPA, 1997).
5. For RME values, assumes trespassing one hour per day, one day per week for 52 weeks per year.
6. Inhalation rates are based on child values assuming moderate activity for the RME (Table 5-23 of EPA, 1997).
7. Inhalation rates are short-term exposure rates based on values for the outdoor worker assuming heavy activity for the RME (Table 5-23 of EPA, 1997).

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Shallow Groundwater
Exposure Point: Contact with Groundwater during Excavation/Trenching Activities
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Groundwater	ug/l	See Table 3.1	EPC Value	Chronic Daily Intake (CDI) (mg/kg-day)=
	CF1	Conversion Factor	mg/ug	0.001	- -	CW x CF1 x IR-W x EF x ED x 1/BW x 1/AT
	IR-W	Ingestion Rate of Groundwater	l/day	0.01	(1)	
	EF	Exposure Frequency	days/year	250	EPA 1991	
	ED	Exposure Duration	years	0.5	(2)	
	BW	Body Weight	kg	70	EPA, 1991	
	AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
	AT-N	Averaging Time - Non-Cancer	days	183	EPA, 1989	
Dermal Absorption	CW	Chemical Concentration in Groundwater	ug/l	See Table 3.1	EPC Value	Dermally Absorbed Dose (DAD) (mg/kg-day) =
	DAevent	Absorbed Dose per Event	mg/cm^2	calculated	- -	DAevent x EV x ED x EF x SA x 1/BW x 1/AT
	EV	Event Frequency	events/day	1	(2)	where for organics (ET<t*):
	CF1	Conversion Factor	mg/ug	0.001	- -	DAevent = 2 FA x Kp x CW x CF1 x CF2 x SQRT[(6 x Tau x ET)/pi]
	SA	Skin Surface Area Available for Contact	cm^2	5,000	(3)	where for organics (ET>t*):
	Kp	Permeability Constant	cm/hr	Chemical Specific	EPA, 2001	DAevent = FA x Kp x CW { (ET/(1 +B)) +2 Tau [1+3B+3B^2/(1 + B)^2]}
	ET	Exposure Time	hours/event	2	(4)	and
	EF	Exposure Frequency	days/year	250	EPA 1991	where for inorganics:
	ED	Exposure Duration	years	0.5	(2)	DAevent = Kp x CW x CF1 x CF2 x ET
	CF2	Volumetric Conversion Factor for Water	l/cm^3	0.001	- -	
	FA	Fraction Absorbed Water	--	Chemical Specific	EPA, 2001	
	Tau	Lag Time per Event	hours/event	Chemical Specific	EPA, 2001	
	t*	Time to Reach Steady-State	hours	Chemical Specific	EPA, 2001	
	BW	Body Weight	kg	70	EPA, 1991	
	B	Ratio of the permeability coefficient of a compound through the outermost skin layer to its permeability coefficient across the entire skin layer	--	Chemical Specific	EPA, 2001	
	AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
	AT-N	Averaging Time - Non-Cancer	days	183	EPA, 1989	

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook, Volume 1. EPA/600/P-95/002Fa.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment. Interim. EPA/540/R/99/05. SA, EV, and ET are obtained from Exhibit 3-2.

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Shallow Groundwater
Exposure Point: Contact with Groundwater during Excavation/Trenching Activities
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name

EPC = Exposure Point Concentration

Notes:
1. Professional Judgment. Assumes 5 ml/hour for two hours per day for a total of 0.01 l/day.
2. Professional Judgment. 1 event per day, 5 days per week for 26 weeks (0.5 years).
3. Professional Judgment. The RME skin surface area is obtained from Table 6-14, central tendency surface area for outdoor contact and assumes 25% of total surface area (EPA 1997).
4. Professional Judgment. Exposure Time = 2 hours of skin contact per day (i.e. per event).

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Mixed Shallow and Intermediate Groundwater (1)
Exposure Point: Tap Water from Mixed Shallow and Intermediate Aquifer (1)
Receptor Population: Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Groundwater	ug/l	(2)	EPC Value	Chronic Daily Intake (CDI) (mg/kg-day)=
	CF1	Conversion Factor	mg/ug	0.001	- -	CW x CF1 x IR-W x EF x ED x 1/BW x 1/AT
	IR-W	Ingestion Rate of Groundwater	l/day	1	(3)	
	EF	Exposure Frequency	days/year	250	EPA, 1991	
	ED	Exposure Duration	years	25	EPA, 1991	
	BW	Body Weight	kg	70	EPA, 1991	
	AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
	AT-N	Averaging Time - Non-Cancer	days	9,125	EPA, 1989	
Dermal Absorption	CW	Chemical Concentration in Groundwater	ug/l	(2)	EPC Value	Dermally Absorbed Dose (DAD) (mg/kg-day) =
	DAevent	Absorbed Dose per Event	mg/cm^2	calculated	- -	DAevent x EV x ED x EF x SA x 1/BW x 1/AT
	EV	Event Frequency	events/day	1	EPA, 2001	where for organics (ET<t*):
	CF1	Conversion Factor	mg/ug	0.001	- -	DAevent = 2 FA x Kp x CW x CF1 x CF2 x SQRT[(6 x Tau x ET)/pi]
	SA	Skin Surface Area Available for Contact	cm^2	18,000	EPA, 2001	where for organics (ET>t*):
	Kp	Permeability Constant	cm/hr	Chemical Specific	EPA, 2001	DAevent = FA x Kp x CW { (ET/(1 +B)) +2 Tau $[1+3B+3B^2/(1 + B)^2]$}
	ET	Exposure Time	hours/event	0.58	EPA, 2001	and
	EF	Exposure Frequency	events/year	250	EPA, 1991	where for inorganics:
	ED	Exposure Duration	years	25	EPA, 1991	DAevent = Kp x CW x CF1 x CF2 x ET
	CF2	Volumetric Conversion Factor for Water	l/cm^3	0.001	- -	
	FA	Fraction Absorbed Water	--	Chemical Specific	EPA, 2001	
	Tau	Lag Time per Event	hours/event	Chemical Specific	EPA, 2001	
	t*	Time to Reach Steady-State	hours	Chemical Specific	EPA, 2001	
	BW	Body Weight	kg	70	EPA, 1991	
	B	Ratio of the permeability coefficient of a compound through the outermost skin layer to its permeability coefficient across the entire skin layer	--	Chemical Specific	EPA, 2001	
	AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
	AT-N	Averaging Time - Non-Cancer	days	9,125	EPA, 1989	

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment. Interim. EPA/540/R/99/05. SA, EV, and ET are obtained from Exhibit 3-2.

EPC = Exposure Point Concentration

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Mixed Shallow and Intermediate Groundwater (1)
Exposure Point: Tap Water from Mixed Shallow and Intermediate Aquifer (1)
Receptor Population: Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name

Notes:
1. This table also applies to the future industrial worker exposed to contaminated tap water from the deep groundwater aquifer.
2. See Table 3.2 for mixed shallow and intermediate groundwater EPC values and Table 3.3 for deep groundwater EPC values.
3. Professional Judgment. Assumes 1 l/day.

TABLE 4.3
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Mixed Shallow and Intermediate Groundwater (1)
Exposure Point: Tap Water from Mixed Shallow and Intermediate Aquifer (1)
Receptor Population: Other Worker (2)
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Ingestion	CW	Chemical Concentration in Groundwater	ug/l	(3)	EPC Value	Chronic Daily Intake (CDI) (mg/kg-day)=
	CF1	Conversion Factor	mg/ug	0.001	- -	CW x CF1 x IR-W x EF x ED x 1/BW x 1/AT
	IR-W	Ingestion Rate of Groundwater	l/day	1	(4)	
	EF	Exposure Frequency	days/year	72	(5)	
	ED	Exposure Duration	years	25	EPA 1991	
	BW	Body Weight	kg	70	EPA, 1991	
	AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
	AT-N	Averaging Time - Non-Cancer	days	9,125	EPA, 1989	
Dermal Absorption	CW	Chemical Concentration in Groundwater	ug/l	(3)	EPC Value	Dermally Absorbed Dose (DAD) (mg/kg-day) =
	DAevent	Absorbed Dose per Event	mg/cm^2	calculated	- -	DAevent x EV x ED x EF x SA x 1/BW x 1/AT
	EV	Event Frequency	events/day	1	(6)	where for organics (ET<t*):
	CF1	Conversion Factor	mg/ug	0.001	- -	DAevent = 2 FA x Kp x CW x CF1 x CF2 x SQRT[(6 x Tau x ET)/pi]
	SA	Skin Surface Area Available for Contact	cm^2	2,000	(7)	where for organics (ET>t*):
	Kp	Permeability Constant	cm/hr	Chemical Specific	EPA, 2001	DAevent = FA x Kp x CW { (ET/(1 +B)) +2 Tau [1+3B+3B^2/(1 + B)^2]}
	ET	Exposure Time	hours/event	1	(6)	and
	EF	Exposure Frequency	events/year	72	(5)	where for inorganics:
	ED	Exposure Duration	years	25	EPA, 1991	DAevent = Kp x CW x CF1 x CF2 x ET
	CF2	Volumetric Conversion Factor for Water	l/cm^3	0.001	- -	
	FA	Fraction Absorbed Water	--	Chemical Specific	EPA, 2001	
	Tau	Lag Time per Event	hours/event	Chemical Specific	EPA, 2001	
	t*	Time to Reach Steady-State	hours	Chemical Specific	EPA, 2001	
	BW	Body Weight	kg	70	EPA, 1991	
	B	Ratio of the permeability coefficient of a compound through the outermost skin layer to its permeability coefficient across the entire skin layer	--	Chemical Specific	EPA, 2001	
	AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
	AT-N	Averaging Time - Non-Cancer	days	9,125	EPA, 1989	

Sources:

EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1997: Exposure Factors Handbook, Volume 1. EPA/600/P-95/002Fa.

EPA, 2001: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment. Interim. EPA/540/R/99/05.

TABLE 4.3
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Mixed Shallow and Intermediate Groundwater (1)
Exposure Point: Tap Water from Mixed Shallow and Intermediate Aquifer (1)
Receptor Population: Other Worker (2)
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name

EPC = Exposure Point Concentration

Notes:

1. This table also applies to the future site/maintenance worker exposed to contaminated tap water from the deep groundwater aquifer used during watering.
2. Other worker is a site or maintenance worker.
3. See Table 3.2 for mixed shallow and intermediate groundwater EPC values and Table 3.3 for deep groundwater EPC values.
4. Professional Judgment. Assumes 1 l/day.
5. Professional Judgment. Assumes watering garden from mid-May through mid-September (18 weeks) at a rate of 4 events per week for a total of 72 events/year (i.e. 72 days/year).
6. Professional Judgment. Assumes one hour per event (i.e. one hour per day), one event per day.
7. Professional Judgment. The skin surface area assumes exposure to hands, forearms, and face and is obtained by averaging both male and female hand, forearm, and face mean values found on Table 6-4 (EPA, 1997).

TABLE 4.4
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air
Exposure Point: Water Vapors at Showerhead - Tap Water from Mixed Shallow and Intermediate Aquifer (1)
Receptor Population: Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Inhalation	EF	Exposure Frequency	days/year	250	EPA, 1991	Intake (mg/kg-day) = (D x EF x ED)/AT
	ED	Exposure Duration	years	25	EPA, 1991	See Foster and Chrostowski, 1987
	AT-C	Averaging Time (Cancer)	days	25550	EPA, 1989	
	AT-N	Averaging Time (Non-Cancer)	days	9125	EPA, 1989	where D = [(IR-SH x S)/(BW x Ra x CF1)] x Q
	D	Inhalation Dose for Each Shower	mg/kg/shower	Chemical Specific	Fos & Chr, 1987	
	IR-SH	Inhalation Rate in Shower	l/min	14	EPA, 2000	where Q = Ds + [(EXP(-Ra x Dt))/Ra] - [(EXP(Ra x (Ds-Dt)))/Ra]
	BW	Body Weight	kg	70	EPA, 1997	
	CF1	Conversion Factor	(ug x l)—(mg x m3)	1.00E+06	- -	where S=CWD x FR / SV
	Q	Function of Air Exchange Rate & Time in Shower & Shower Room	min	Chemical Specific	Fos & Chr, 1987	
	Ds	Duration of Shower	min	15	EPA, 1997	where CWD = CW x (1-EXP[(-KaL x ts)/(60 x d)])
	Dt	Total Time in Shower Room	min	20	EPA, 1997	
	Ra	Rate of Air Exchange	l/min	0.01667	Fos & Chr, 1987	where KaL = KL/SQRT[(T1 x us)/(Ts x u1)]
	S	Indoor VOC Generation Rate	ug/m3/min	Chemical Specific	Fos & Chr, 1987	
	FR	Shower Flow Rate	l/min	20	Professional Judgment	
	SV	Shower Room Air Volume	m3	6	EPA, 1997	
	CWD	Chemical Concentration Leaving Water Droplet after time ts	ug/l	Chemical Specific	Fos & Chr, 1987	
	CW	Chemical Concentration in Water	ug/l	(2)	EPC Value	
	ts	Shower Droplet Time	sec	2	Fos & Chr, 1987	
	d	Shower Droplet Diameter	mm	1	Fos & Chr, 1987	
	KaL	Adjusted overall mass transfer coefficient	cm/hr	Chemical Specific	Fos & Chr, 1987	
	T1	Calibration Water Temperature of KL	K	293	Fos & Chr, 1987	
	Ts	Shower Water Temperature	K	318	Fos & Chr, 1987	
	u1	Water Viscosity at T1	centpose	1.002	Fos & Chr, 1987	
	us	Water Viscosity at Ts	centpose	0.596	Fos & Chr, 1987	

Sources:
EPA, 1989: Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1997: Exposure Factors Handbook, Vols. 1 and 3. EPA/600/P-95/002Fa and Fc.
EPA, 2000. Recommended by EPA Region III. Based on an inhalation rate of 20 m3/day.
Foster, S. A. and P. C. Chrostowski, 1987. Inhalation Exposures to Volatile Organic Contaminants in the Shower.
EPC = Exposure Point Concentration

TABLE 4.4
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air
Exposure Point: Water Vapors at Showerhead - Tap Water from Mixed Shallow and Intermediate Aquifer (1)
Receptor Population: Industrial Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name

Notes:
1. This table also applies to the future industrial worker exposed to water vapors from showerheads using contaminated tap water from the deep groundwater aquifer.
2. See Table 3.2 for mixed shallow and intermediate groundwater EPC values and Table 3.3 for deep groundwater EPC values.

TABLE 4.5
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU2

Scenario Timeframe: Future
Medium: Groundwater
Exposure Medium: Air
Exposure Point: Vapors from Shallow Groundwater entering Excavation/Trench
Receptor Population: Construction Worker
Receptor Age: Adult

Exposure Route	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Inhalation	CA	Chemical Concentration in Air	ug/m^3	See Table 3.4	EPC Value	Chronic Daily Intake (CDI) (mg/kg-day) =
	CF1	Conversion Factor	mg/ug	0.001	- -	CA x CF1 x IR-A x EF x ED x 1/BW x 1/AT
	IR-A	Inhalation Rate	m^3/day	20	EPA, 1991	
	EF	Exposure Frequency	days/year	250	EPA 1991	
	ED	Exposure Duration	years	0.5	(1)	
	BW	Body Weight	kg	70	EPA, 1991	
	AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
	AT-N	Averaging Time - Non-Cancer	days	183	EPA, 1989	

Sources:
EPA, 1989. Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1991. Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
EPC = Exposure Point Concentration

Notes:
1. Professional Judgment. 1 event per day, 5 days per week for 26 weeks (0.5 years).

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU3

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Shellfish Tissue

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Fisher (Subsistence)	Adult	Crab meat from crabs collected adjacent to the AWI site: Crab meat from crabs collected near Scuffletown Creek	CCM	Chemical Concentration in one Crab - Meat	mg/kg	TBD	EPC Value	Equation 1: Chronic Daily Intake (CDI) (mg/kg-day per crab))= CCM x CF1 x IR-C x FI x EF x ED x 1/BW x 1/AT
				CF1	Conversion Factor	kg/g	0.001	- -	
				IR-C	Ingestion Rate of Crabs per Meal:	g/meal	19.1	Average crab meat wt. from all crabs collected (grams per crab assuming 1 crab per meal))	
					Number of Crabs Ingested per Meal - High Frequency	crabs/meal	24	Professional Judgment	
					Number of Crabs Ingested per Meal - Medium Frequency	crabs/meal	12	Professional Judgment	
					Number of Crabs Ingested per Meal - Low frequency	crabs/meal	6	Professional Judgment	
				FI	Fraction Ingested from Contaminated Source	unitless	1	(a)	
				EF	Exposure Frequency	meals/year	156	Assumes 3 meals per week [1]	
				ED	Exposure Duration	years	30	EPA, 1991	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	10,950	EPA, 1989	
			Whole crab (meat and hepatopancreas) from crabs collected adjacent to the AWI site: Whole crab (meat and hepatopancreas) from crabs collected near Scuffletown Creek	CWC	Chemical Concentration in one Crab - Whole Crab	mg/kg	TBD	EPC Value	Equation 2: Chronic Daily Intake (CDI) (mg/kg-day per crab)= CWC x CF1 x IR-C x FI x EF x ED x 1/BW x 1/AT
				CF1	Conversion Factor	kg/g	0.001	- -	
				IR-C	Ingestion Rate of Crabs per Meal:	g/meal	29.2	Average crab meat and hepatopancreas wt. from all crabs collected (grams per crab assuming 1 crab per meal))	
					Number of Crabs Ingested per Meal - High Frequency	crabs/meal	24	Professional Judgment	
					Number of Crabs Ingested per Meal - Medium Frequency	crabs/meal	12	Professional Judgment	
					Number of Crabs Ingested per Meal - Low frequency	crabs/meal	6	Professional Judgment	
				FI	Fraction Ingested from Contaminated Source	unitless	1	(a)	
				EF	Exposure Frequency	meals/year	156	Assumes 3 meals per week [1]	
				ED	Exposure Duration	years	30	EPA, 1991	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	10,950	EPA, 1989	
			Oyster meat from oysters collected adjacent to the AWI site	COM	Chemical Concentration in Oyster Meat	mg/kg	TBD	EPC Value	Equation 3: Chronic Daily Intake (CDI) (mg/kg-day per oyster)= COM x CF1 x IR-O x FI x EF x ED x 1/BW x 1/AT
				CF1	Conversion Factor	kg/g	0.001	- -	
				IR-O	Ingestion Rate of Oyster Meat per Meal:	g/meal	12.7	Average wt. natural oyster (grams per oyster assuming 1 oyster per meal))	
					Number of Oysters Ingested per Meal - High Frequency	oysters/meal	72	Professional Judgment	
					Number of Oysters Ingested per Meal - Medium Frequency	oysters/meal	24	Professional Judgment	
					Number of Oysters Ingested per Meal - Low frequency	oysters/meal	6	Professional Judgment	
				FI	Fraction Ingested from Contaminated Source	unitless	1	(a)	
				EF	Exposure Frequency	meals/year	104	Assumes 2 meals per week	
				ED	Exposure Duration	years	30	EPA, 1991	
				BW	Body Weight	kg	70	EPA, 1991	

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU3

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Shellfish Tissue

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	10,950	EPA, 1989	
		Child		CCM	Chemical Concentration in one Crab - Meat	mg/kg	TBD	EPC Value	See Equation 1
				CF1	Conversion Factor	kg/g	0.001	- -	
			Crab meat from crabs collected adjacent to the AWI site: Crab meat from crabs collected near Scuffletown Creek	IR-C	Ingestion Rate of Crabs per Meal:	g/meal	19.1	Average crab meat wt. from all crabs collected (grams per crab assuming 1 crab per meal))	
					Number of Crabs Ingested per Meal - High Frequency	crabs/meal	9	Professional Judgment	
					Number of Crabs Ingested per Meal - Medium Frequency	crabs/meal	3	Professional Judgment	
					Number of Crabs Ingested per Meal - Low frequency	crabs/meal	1	Professional Judgment	
				FI	Fraction Ingested from Contaminated Source	unitless	1	(a)	
				EF	Exposure Frequency	meals/year	78	Assumes 1.5 meals per week	
				ED	Exposure Duration	years	6	EPA, 1991	
				BW	Body Weight	kg	15	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	2,190	EPA, 1989	
				CWC	Chemical Concentration in one Crab - Whole Crab	mg/kg	TBD	EPC Value	See Equation 2
				CF1	Conversion Factor	kg/g	0.001	- -	
			Whole crab (meat and hepatopancreas) from crabs collected adjacent to the AWI site: Whole crab (meat and hepatopancreas) from crabs collected near Scuffletown Creek	IR-C	Ingestion Rate of Crabs per Meal:	g/meal	29.2	Average crab meat and hepatopancreas wt. from all crabs collected (grams per crab assuming 1 crab per meal))	
					Number of Crabs Ingested per Meal - High Frequency	crabs/meal	9	Professional Judgment	
					Number of Crabs Ingested per Meal - Medium Frequency	crabs/meal	3	Professional Judgment	
					Number of Crabs Ingested per Meal - Low frequency	crabs/meal	1	Professional Judgment	
				FI	Fraction Ingested from Contaminated Source	unitless	1	(a)	
				EF	Exposure Frequency	meals/year	78	Assumes 1.5 meals per week	
				ED	Exposure Duration	years	6	EPA, 1991	
				BW	Body Weight	kg	15	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	2,190	EPA, 1989	
	Fisher (Recreational)	Adult		CCM	Chemical Concentration in one Crab - Meat	mg/kg	TBD	EPC Value	See Equation 1
				CF1	Conversion Factor	kg/g	0.001	- -	
			Crab meat from crabs collected adjacent to the AWI site: Crab meat from crabs collected near Scuffletown Creek	IR-C	Ingestion Rate of Crabs per Meal:	g/meal	19.1	Average crab meat wt. from all crabs collected (grams per crab assuming 1 crab per meal))	
					Number of Crabs Ingested per Meal - High Frequency	crabs/meal	24	Professional Judgment	
					Number of Crabs Ingested per Meal - Medium Frequency	crabs/meal	12	Professional Judgment	
					Number of Crabs Ingested per Meal - Low frequency	crabs/meal	6	Professional Judgment	
				FI	Fraction Ingested from Contaminated Source	unitless	1	(a)	

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU3

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Shellfish Tissue

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
				EF	Exposure Frequency	meals/year	52	Assumes 1 meal per week	
				ED	Exposure Duration	years	30	EPA, 1991	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	10,950	EPA, 1989	
			Whole crab (meat and hepatopancreas) from crabs collected adjacent to the AWI site; Whole crab (meat and hepatopancreas) from crabs collected near Scuffletown Creek	CWC	Chemical Concentration in one Crab - Whole Crab	mg/kg	TBD	EPC Value	See Equation 2
				CF1	Conversion Factor	kg/g	0.001	- -	
				IR-C	Ingestion Rate of Crabs per Meal:	g/meal	29.2	Average crab meat and hepatopancreas wt. from all crabs collected (grams per crab assuming 1 crab per meal))	
					Number of Crabs Ingested per Meal - High Frequency	crabs/meal	24	Professional Judgment	
					Number of Crabs Ingested per Meal - Medium Frequency	crabs/meal	12	Professional Judgment	
					Number of Crabs Ingested per Meal - Low frequency	crabs/meal	6	Professional Judgment	
				FI	Fraction Ingested from Contaminated Source	unitless	1	(a)	
				EF	Exposure Frequency	meals/year	52	Assumes 1 meal per week	
				ED	Exposure Duration	years	30	EPA, 1991	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	10,950	EPA, 1989	
			Oyster meat from oysters collected adjacent to the AWI site	COM	Chemical Concentration in Oyster Meat	ug/kg	TBD	EPC Value	See Equation 3
				CF1	Conversion Factor	mg/ug	0.001	- -	
				IR-O	Ingestion Rate of Oyster Meat per Meal:	g/meal	12.7	Average wt. natural oyster (grams per oyster assuming 1 oyster per meal))	
					Number of Oysters Ingested per Meal - High Frequency	oysters/meal	72	Professional Judgment	
					Number of Oysters Ingested per Meal - Medium Frequency	oysters/meal	24	Professional Judgment	
					Number of Oysters Ingested per Meal - Low frequency	oysters/meal	6	Professional Judgment	
				FI	Fraction Ingested from Contaminated Source	unitless	1	(a)	
				EF	Exposure Frequency	meals/year	52	Assumes 1 meal per week	
				ED	Exposure Duration	years	30	EPA, 1991	
				BW	Body Weight	kg	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	10,950	EPA, 1989	
		Child	Crab meat from crabs collected adjacent to the AWI site; Crab meat from crabs collected near Scuffletown Creek	CCM	Chemical Concentration in one Crab - Meat	mg/kg	TBD	EPC Value	See Equation 1
				CF1	Conversion Factor	kg/g	0.001	- -	
				IR-C	Ingestion Rate of Crabs per Meal:	g/meal	19.1	Average crab meat wt. from all crabs collected (grams per crab assuming 1 crab per meal))	
					Number of Crabs Ingested per Meal - High Frequency	crabs/meal	9	Professional Judgment	
					Number of Crabs Ingested per Meal - Medium Frequency	crabs/meal	3	Professional Judgment	

TABLE 4.1
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU3

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Shellfish Tissue

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	Intake Equation/ Model Name
					Number of Crabs Ingested per Meal - Low frequency	crabs/meal	1	Professional Judgment	
				FI	Fraction Ingested from Contaminated Source	unitless	1	(a)	
				EF	Exposure Frequency	meals/year	52	Assumes 1 meal per week	
				ED	Exposure Duration	years	6	EPA, 1991	
				BW	Body Weight	kg	15	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	2,190	EPA, 1989	
				CWC	Chemical Concentration in one Crab - Whole Crab	mg/kg	TBD	EPC Value	See Equation 2
				CF1	Conversion Factor	kg/g	0.001	- -	
			Whole crab (meat and hepatopancreas) from crabs collected adjacent to the AWI site: Whole crab (meat and hepatopancreas) from crabs collected near Scuffletown Creek	IR-C	Ingestion Rate of Crabs per Meal:	g/meal	29.2	Average crab meat and hepatopancreas wt. from all crabs collected (grams per crab assuming 1 crab per meal))	
					Number of Crabs Ingested per Meal - High Frequency	crabs/meal	9	Professional Judgment	
					Number of Crabs Ingested per Meal - Medium Frequency	crabs/meal	3	Professional Judgment	
					Number of Crabs Ingested per Meal - Low frequency	crabs/meal	1	Professional Judgment	
				FI	Fraction Ingested from Contaminated Source	unitless	1	(a)	
				EF	Exposure Frequency	meals/year	52	Assumes 1 meal per week	
				ED	Exposure Duration	years	6	EPA, 1991	
				BW	Body Weight	kg	15	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	2,190	EPA, 1989	

Sources:
EPA, 1989. Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.
EPA, 1991. Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.
TBD = To Be Determined
RME = Reasonable Maximum Exposure
EPC = Exposure Point Concentration
a. Conservative. Assuming 100% of shellfish diet is shellfish caught from creek.
1. Assumes the 156 meals will occur in a shorter time period than one year.

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU3

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Ingestion	Trespasser	Adult	Shallow sediment in the vicinity of the AWI site	CS	Chemical Concentration in Sediment	mg/kg	TBD	- -	TBD	- -	Equation 1:
				IR-S	Ingestion Rate of Sediment	mg/day	100	Professional Judgment	50	Assume 1/2 RME	Chronic Daily Intake (CDI) (mg/kg-day) =
				FI	Fraction Ingested from Contaminated Source	- -	1	(a)	1	(a)	CS x IR-S x FI x EF x ED x CF1 x 1/BW x 1/AT
				EF	Exposure Frequency	days/year	80	2 days per week for the 40 warmest weeks of the year	40	Assume 1/2 RME	
				ED	Exposure Duration	years	30	EPA, 1991	9	EPA, 1993	
				CF1	Conversion Factor 1	kg/mg	1E-06	- -	1E-06	- -	
				BW	Body Weight	kg	70	EPA, 1991	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	25550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	10,950	EPA, 1989	3285	EPA, 1989	
		Child	Shallow sediment in the vicinity of the AWI site	CS	Chemical Concentration in Sediment	mg/kg	TBD	- -	TBD	- -	
				IR-S	Ingestion Rate of Sediment	mg/day	200	Professional Judgment	100	Assume 1/2 RME	
				FI	Fraction Ingested from Contaminated Source	- -	1	(a)	1	(a)	
				EF	Exposure Frequency	days/year	104	2 days per week for a full year	52	Assume 1/2 RME	
				ED	Exposure Duration	years	6	EPA, 1991	6	EPA, 1991	
				CF1	Conversion Factor 1	kg/mg	1E-06	- -	1E-06	- -	
				BW	Body Weight	kg	15	EPA, 1991	15	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	25550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	2,190	EPA, 1989	2190	EPA, 1989	
Dermal	Trespasser	Adult	Shallow sediment in the vicinity of the AWI site	CS	Chemical Concentration in Soil	mg/kg	TBD	- -	TBD	- -	Equation 2:
				DAevent	Absorbed dose per event	mg/cm2 - event	calculated	- -	calculated	- -	DAD (Dermal Absorbed Dose) (mg/kg-day) =
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	1.00E-06	- -	DAevent x EF x ED x EV x SA / (BW x AT)
				AF	Soil to Skin Adherence Factor	mg/cm2 - event	0.316	(b)	0.316	(b)	where
				ABSd	Dermal Absorption Fraction	unitless	chemical-specific	EPA, 2004	chemical-specific	EPA, 2004	DAevent = CS x CF1 x AF x ABSd
				SA	Skin Surface Area Available for Contact	cm2	5,700	(c)	5,700	(c)	
				EV	Event Frequency	events/day	1	Professional Judgment	1	Professional Judgment	
				EF	Exposure Frequency	days/year	80	2 days per week for the 40 warmest weeks of the year	40	Assume 1/2 RME	
				ED	Exposure Duration	years	30	EPA, 1991	9	EPA, 1993	
				BW	Body Weight	kg	70	EPA, 1991	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25550	EPA, 1989	25550	EPA, 1989	

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU3

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
				AT-N	Averaging Time - Non-Cancer	days	10950	EPA, 1989	3285	EPA, 1989	
		Child	Shallow sediment in the vicinity of the AWI site	CS	Chemical Concentration in Sediment	mg/kg	TBD	- -	TBD	- -	
				DAevent	Absorbed dose per event	mg/cm^2 - event	calculated	- -	calculated	- -	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	1.00E-06	- -	
				AF	Soil to Skin Adherence Factor	mg/cm^2 - event	20.6	(d)	20.6	(d)	
				ABSd	Dermal Absorption Fraction	unitless	chemical-specific	EPA, 2004	chemical-specific	EPA, 2004	
				SA	Skin Surface Area Available for Contact	cm^2	2,800	(e)	2,800	(e)	
				EV	Event Frequency	events/day	1	Professional Judgment	1	Professional Judgment	
				EF	Exposure Frequency	days/year	104	2 days per week for a full year	52	Assume 1/2 RME	
				ED	Exposure Duration	years	6	EPA, 1991	6	EPA, 1991	
				BW	Body Weight	kg	15	EPA, 1991	15	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	25550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	2,190	EPA, 1989	2190	EPA, 1989	
Ingestion	Other Recreation Person (Swimmer/Boater/ Crabber)	Adult	Shallow sediment in the vicinity of the AWI site	CS	Chemical Concentration in Sediment	mg/kg	TBD	- -	TBD	- -	See Equation 1
				IR-S	Ingestion Rate of Sediment	mg/day	100	Professional Judgment	50	Assume 1/2 RME	
				FI	Fraction Ingested from Contaminated Source	- -	1	(a)	1	(a)	
				EF	Exposure Frequency	days/year	32	2 days per week for 4 weeks per month for 4 months per year	32	2 days per week for 4 weeks per month for 4 months per year	
				ED	Exposure Duration	years	30	EPA, 1991	9	EPA, 1993	
				CF1	Conversion Factor 1	kg/mg	1E-06	- -	1E-06	- -	
				BW	Body Weight	kg	70	EPA, 1991	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	25550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	10,950	EPA, 1989	3,285	EPA, 1989	
		Child	Shallow sediment in the vicinity of the AWI site	CS	Chemical Concentration in Sediment	mg/kg	TBD	- -	TBD	- -	
				IR-S	Ingestion Rate of Sediment	mg/day	200	Professional Judgment	100	Assume 1/2 RME	
				FI	Fraction Ingested from Contaminated Source	- -	1	(a)	1	(a)	
				EF	Exposure Frequency	days/year	48	3 days per week for 4 weeks per month for 4 months per year	48	3 days per week for 4 weeks per month for 4 months per year	
				ED	Exposure Duration	years	6	EPA, 1991	6	EPA, 1991	
				CF1	Conversion Factor 1	kg/mg	1E-06	- -	1E-06	- -	
				BW	Body Weight	kg	15	EPA, 1991	15	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	25550	EPA, 1989	

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU3

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
				AT-N	Averaging Time - Non-Cancer	days	2,190	EPA, 1989	2190	EPA, 1989	
Dermal	Other Recreation Person (Swimmer/Boater/ Crabber)	Adult	Shallow sediment in the vicinity of the AWI site	CS	Chemical Concentration in Soil	mg/kg	TBD	- -	TBD	- -	See Equation 2
				DAevent	Absorbed dose per event	mg/cm^2 - event	calculated	- -	calculated	- -	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	1.00E-06	- -	
				AF	Soil to Skin Adherence Factor	mg/cm^2 - event	0.316	(b)	0.316	(b)	
				ABSd	Dermal Absorption Fraction	unitless	chemical-specific	EPA, 2004	chemical-specific	EPA, 2004	
				SA	Skin Surface Area Available for Contact	cm^2	18,000	(l)	5,700	(c)	
				EV	Event Frequency	events/day	1	Professional Judgment	1	Professional Judgment	
				EF	Exposure Frequency	days/year	32	2 days per week for 4 weeks per month for 4 months per year	32	2 days per week for 4 weeks per month for 4 months per year	
				ED	Exposure Duration	years	30	EPA, 1991	9	EPA, 1993	
				BW	Body Weight	kg	70	EPA, 1991	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25550	EPA, 1989	25550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	10950	EPA, 1989	3285	EPA, 1989	
		Child	Shallow sediment in the vicinity of the AWI site	CS	Chemical Concentration in Sediment	mg/kg	TBD	- -	TBD	- -	
				DAevent	Absorbed dose per event	mg/cm^2 - event	calculated	- -	calculated	- -	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	1.00E-06	- -	
				AF	Soil to Skin Adherence Factor	mg/cm^2 - event	20.6	(d)	20.6	(d)	
				ABSd	Dermal Absorption Fraction	unitless	chemical-specific	EPA, 2004	chemical-specific	EPA, 2004	
				SA	Skin Surface Area Available for Contact	cm^2	6,600	(l)	2,800	(e)	
				EV	Event Frequency	events/day	1	Professional Judgment	1	Professional Judgment	
				EF	Exposure Frequency	days/year	48	3 days per week for 4 weeks per month for 4 months per year	48	3 days per week for 4 weeks per month for 4 months per year	
				ED	Exposure Duration	years	6	EPA, 1991	6	EPA, 1991	
				BW	Body Weight	kg	15	EPA, 1991	15	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	25550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	2,190	EPA, 1989	2190	EPA, 1989	
Ingestion	Worker (i.e. dredge or other heavy equipment operator, spotter, barge worker)	Adult	Sediment in the vicinity of the AWI site	CS	Chemical Concentration in Sediment	mg/kg	TBD	- -	TBD	- -	See Equation 1
				IR-S	Ingestion Rate of Sediment	mg/day	50	Professional Judgment	5	Professional Judgment	
				FI	Fraction Ingested from Contaminated Source	- -	1	(a)	1	(a)	
				EF	Exposure Frequency	days/year	250	1 year of work	125	Assume 1/2 RME	
				ED	Exposure Duration	years	1	Professional Judgment	1	Professional Judgment	
				CF1	Conversion Factor 1	kg/mg	1E-06	- -	1E-06	- -	
				BW	Body Weight	kg	70	EPA, 1991	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25,550	EPA, 1989	25550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	365	EPA, 1989	365	EPA, 1989	

TABLE 4.2
VALUES USED FOR DAILY INTAKE CALCULATIONS
Atlantic Wood Industries Superfund Site - OU3

Scenario Timeframe:	Current/Future
Medium:	Sediment
Exposure Medium:	Sediment

Exposure Route	Receptor Population	Receptor Age	Exposure Point	Parameter Code	Parameter Definition	Units	RME Value	RME Rationale/ Reference	CT Value	CT Rationale/ Reference	Intake Equation/ Model Name
Dermal	Worker (i.e. dredge or other heavy equipment operator, spotter, barge worker)	Adult	Sediment in the vicinity of the AWI site	CS	Chemical Concentration in Soil	mg/kg	TBD	- -	TBD	- -	See Equation 2
				DAevent	Absorbed dose per event	mg/cm^2 - event	calculated	- -	calculated	- -	
				CF1	Conversion Factor	kg/mg	1.00E-06	- -	1.00E-06	- -	
				AF	Soil to Skin Adherence Factor	mg/cm^2 - event	0.316	(b)	0.316	(b)	
				ABSd	Dermal Absorption Fraction	unitless	chemical-specific	EPA, 2004	chemical-specific	EPA, 2004	
				SA	Skin Surface Area Available for Contact	cm^2	3,300	(e)	3,300	(e)	
				EV	Event Frequency	events/day	1	Professional Judgment	1	Professional Judgment	
				EF	Exposure Frequency	days/year	250	1 year of work	125	Assume 1/2 RME	
				ED	Exposure Duration	years	1	Professional Judgment	1	Professional Judgment	
				BW	Body Weight	kg	70	EPA, 1991	70	EPA, 1991	
				AT-C	Averaging Time - Cancer	days	25550	EPA, 1989	25550	EPA, 1989	
				AT-N	Averaging Time - Non-Cancer	days	365	EPA, 1989	365	EPA, 1989	

Sources:

EPA, 1989. Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part A. OERR. EPA/540/1-89/002.

EPA, 1991. Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual - Supplemental Guidance, Standard Default Exposure Factors. Interim Final. OSWER Directive 9285.6-03.

EPA, 1993. Superfund's Standard Default Exposure Factors for Central Tendency and Reasonable Maximum Exposure. Draft.

EPA, 2004. Risk Assessment Guidance for Superfund. Vol. 1: Human Health Evaluation Manual, Part E, Supplemental Guidance for Dermal Risk Assessment. Final. EPA/540/R/99/05.

a. Professional Judgment. Fraction ingested is 100% from source.

b. EPA 2004. Exhibit C-2. Page C-14. Reed Gatherers geometric mean.

c. EPA 2004. Page 3-10.

d. EPA 2004. Exhibit C-2. Page C-6. Children in mud geometric mean.

e. EPA 2004. Page 3-11.

f. EPA, 2004. Exhibit 3-2.

g. Professional Judgment. 8 hours per day of exposure based on an average workday.