



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	On-Base	Commercial/Industrial Worker
Pathway:	Direct Contact (Dermal / Ingestion / Inhalation) with Surface Soils	
Source:	SS01	On-Base Surface Soils
Scenario ID:	1	SS01NC(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Adult	Adult	Adult	Adult
Exposure Duration (ED)	years	10	10	30	30
Exposure Frequency (EF)	days/year	240	240	240	240
Exposure Time (ET)	hours/day	1	1	8	8
Averaging Time (AT)	years	10	10	30	30
Event Frequency (EV)	events/day	1	1	1	1
Body Weight (BW)	kg	75	75	70	70
Soil Ingestion Rate (IR)	mg/day	25	25	30	30
Exposed Skin Area (SA)	cm ²	6300	6300	7900	7900
Soil Adherence (AD)	mg/cm ²	0.2	0.2	0.7	0.7
		Soil	Soil	Soil	Soil
Particulate Retention (PR)	unitless	0.375	0.375	0.375	0.375
Particle Emission Factor (PEF)	m ³ /kg	6.60E+08	6.60E+08	6.60E+08	6.60E+08

Contaminant	Soil Concentration mg/kg	Toxicity Criteria			Absorption Factor (ABS)		Bioavailability (Bo)	Estimated Intake Dose			% TDI Allocated to Contaminated Sites	Estimated HQ			Combined HQ
		TDI (mg/kg-day)		TC (mg/m ³)	Inhalation (unitless)	Dermal (unitless)		CDI (mg/kg-day)		EC (mg/m ³)		Soil Ingestion	Dermal	Particulates Inhalation	
		Oral	Dermal	Particulate Inhalation				Soil Ingestion	Dermal	Particulates Inhalation					
Adult - Typical Exposure															
PFOS + PFHxS	3.2E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	7.0E-07	1.8E-08	5.0E-11	93%	3.8E-02	9.5E-04	7.7E-07	3.9E-02
PFOA	2.7E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	5.9E-09	1.5E-10	4.2E-13	100%	3.7E-05	9.3E-07	7.5E-10	3.8E-05
Total HI															0.039
Adult - Upper Exposure															
PFOS + PFHxS	8.4E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	2.4E-06	2.2E-07	1.0E-09	93%	1.3E-01	1.2E-02	1.6E-05	1.4E-01
PFOA	5.9E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	1.7E-08	1.5E-09	7.3E-12	100%	1.0E-04	9.6E-06	1.3E-08	1.1E-04
Total HI															0.14



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	On-Base	Commercial/Industrial Worker
Pathway:	Direct Contact	(Dermal / Ingestion) with Surface Water
Source:	SW01	On-Base Surface Waters
Scenario ID:	2	SW01NC(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Adult	Adult	Adult	Adult
Exposure Duration (ED)	years	10		30	
Exposure Frequency (EF)	days/year	240		240	
Exposure Time (ET)	hours/day	0.25		1	
Averaging Time (AT)	years	10		30	
Body Weight (BW)	kg	75		70	
Exposed Skin Area (SA)	cm ²	6300		7900	
Incidental Ingestion Rate (IR)	L/hr	0.0025		0.0125	

Contaminant	Source Water Concentration mg/L	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
		TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	4.4E-04	2.0E-05	2.0E-05	1.0E-06	100%	2.4E-09	6.1E-12	93%	1.3E-04	3.3E-07	1.3E-04
PFOA	1.3E-05	1.6E-04	1.6E-04	1.0E-06	100%	7.1E-11	1.8E-13	100%	4.5E-07	1.1E-09	4.5E-07
									Total HI		0.000
Adult - Upper Exposure											
PFOS + PFHxS	8.4E-04	2.0E-05	2.0E-05	1.0E-06	100%	9.9E-08	6.2E-11	93%	5.3E-03	3.4E-06	5.3E-03
PFOA	2.5E-05	1.6E-04	1.6E-04	1.0E-06	100%	2.9E-09	1.9E-12	100%	1.8E-05	1.2E-08	1.8E-05
									Total HI		0.005



Estimation of Hazard Index

RAAF Base Darwin

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Receptor:	On-Base	Maintenance/Subsurface Worker
Pathway:	Direct Contact (Dermal / Ingestion / Inhalation) with Soils	
Source:	SL01	On-Base Soil to 1m
Scenario ID:	3	SL01NT(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Adult	Adult	Adult	Adult
Exposure Duration (ED)	years	10	10	30	30
Exposure Frequency (EF)	days/year	20	20	40	40
Exposure Time (ET)	hours/day	8	8	10	10
Averaging Time (AT)	years	10	10	30	30
Event Frequency (EV)	events/day	1	1	1	1
Body Weight (BW)	kg	75	75	70	70
Soil Ingestion Rate (IR)	mg/day	50	50	330	330
Exposed Skin Area (SA)	cm ²	6300	6300	7900	7900
Soil Adherence (AD)	mg/cm ²	0.2	0.2	0.9	0.9
		Soil	Soil	Soil	Soil
Particulate Retention (PR)	unitless	0.375	0.375	0.375	0.375
Particle Emission Factor (PEF)	m ³ /kg	6.60E+08	6.60E+08	6.60E+08	6.60E+08

Contaminant	Soil Concentration mg/kg	Toxicity Criteria			Absorption Factor (ABS)		Bioavailability (Bo)	Estimated Intake Dose			% TDI Allocated to Contaminated Sites	Estimated HQ			Combined HQ
		TDI (mg/kg-day)		TC (mg/m ³)	Inhalation (unitless)	Dermal (unitless)		CDI (mg/kg-day)		EC (mg/m ³)		Soil Ingestion	Dermal	Particulates Inhalation	
		Oral	Dermal	Particulate Inhalation				Soil Ingestion	Dermal	Particulates Inhalation					
Adult - Typical Exposure															
PFOS + PFHxS	3.1E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	1.1E-07	1.4E-09	3.2E-11	93%	6.1E-03	7.7E-05	4.9E-07	6.2E-03
PFOA	2.8E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	1.0E-09	1.3E-11	2.9E-13	100%	6.4E-06	8.1E-08	5.2E-10	6.5E-06
Total HI															0.0062
Adult - Upper Exposure															
PFOS + PFHxS	7.9E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	4.1E-06	4.4E-08	2.0E-10	93%	2.2E-01	2.4E-03	3.1E-06	2.2E-01
PFOA	6.0E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	3.1E-08	3.3E-10	1.6E-12	100%	1.9E-04	2.1E-06	2.8E-09	2.0E-04
Total HI															0.22



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	On-Base	Maintenance/Subsurface Worker
Pathway:	Direct Contact	(Dermal / Ingestion) with Groundwater
Source:	GW07	On-Base Groundwater (<1mbgs)
Scenario ID:	4	GW07NT(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Adult	Adult	Adult	Adult
Exposure Duration (ED)	years	10	30		
Exposure Frequency (EF)	days/year	20	40		
Exposure Time (ET)	hours/day	8	10		
Averaging Time (AT)	years	10	30		
Body Weight (BW)	kg	75	70		
Exposed Skin Area (SA)	cm ²	6300	7900		
Incidental Ingestion Rate (IR)	L/hr	0.0025	0.0125		

Contaminant	Source Water Concentration mg/L	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
		TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	3.5E-02	2.0E-05	2.0E-05	1.0E-06	100%	5.1E-07	1.3E-09	93%	2.7E-02	6.9E-05	2.8E-02
PFOA	5.8E-04	1.6E-04	1.6E-04	1.0E-06	100%	8.5E-09	2.1E-11	100%	5.3E-05	1.3E-07	5.3E-05
									Total HI		0.028
Adult - Upper Exposure											
PFOS + PFHxS	3.7E-02	2.0E-05	2.0E-05	1.0E-06	100%	7.2E-06	4.6E-09	93%	3.9E-01	2.5E-04	3.9E-01
PFOA	5.9E-04	1.6E-04	1.6E-04	1.0E-06	100%	1.2E-07	7.3E-11	100%	7.2E-04	4.6E-07	7.2E-04
									Total HI		0.39



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	On-Base	Maintenance/Subsurface Worker
Pathway:	Direct Contact	(Dermal / Ingestion) with Surface Water
Source:	SW01	On-Base Surface Waters
Scenario ID:	5	SW01NT(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Adult	Adult	Adult	Adult
Exposure Duration (ED)	years	10		30	
Exposure Frequency (EF)	days/year	20		40	
Exposure Time (ET)	hours/day	8		10	
Averaging Time (AT)	years	10		30	
Body Weight (BW)	kg	75		70	
Exposed Skin Area (SA)	cm ²	6300		7900	
Incidental Ingestion Rate (IR)	L/hr	0.0025		0.0125	

Contaminant	Source Water Concentration mg/L	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
		TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	4.4E-04	2.0E-05	2.0E-05	1.0E-06	100%	6.4E-09	1.6E-11	93%	3.5E-04	8.7E-07	3.5E-04
PFOA	1.3E-05	1.6E-04	1.6E-04	1.0E-06	100%	1.9E-10	4.8E-13	100%	1.2E-06	3.0E-09	1.2E-06
										Total HI	0.00035
Adult - Upper Exposure											
PFOS + PFHxS	8.4E-04	2.0E-05	2.0E-05	1.0E-06	100%	1.6E-07	1.0E-10	93%	8.8E-03	5.6E-06	8.8E-03
PFOA	2.5E-05	1.6E-04	1.6E-04	1.0E-06	100%	4.9E-09	3.1E-12	100%	3.1E-05	1.9E-08	3.1E-05
										Total HI	0.0089



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	On-Base	Maintenance/Subsurface Worker
Pathway:	Direct Contact	(Dermal / Ingestion) with Effluent Water
Source:	EW01	On-Base Effluent Water
Scenario ID:	6	EW01NT(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Adult	Adult	Adult	Adult
Exposure Duration (ED)	years	10		30	
Exposure Frequency (EF)	days/year	20		40	
Exposure Time (ET)	hours/day	8		10	
Averaging Time (AT)	years	10		30	
Body Weight (BW)	kg	75		70	
Exposed Skin Area (SA)	cm ²	6300		7900	
Incidental Ingestion Rate (IR)	L/hr	0.0025		0.0125	

Contaminant	Source Water Concentration mg/L	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
		TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	2.1E-01	2.0E-05	2.0E-05	1.0E-06	100%	3.1E-06	7.7E-09	93%	1.6E-01	4.2E-04	1.7E-01
PFOA	9.5E-02	1.6E-04	1.6E-04	1.0E-06	100%	1.4E-06	3.5E-09	100%	8.7E-03	2.2E-05	8.7E-03
										Total HI	0.17
Adult - Upper Exposure											
PFOS + PFHxS	2.1E-01	2.0E-05	2.0E-05	1.0E-06	100%	4.1E-05	2.6E-08	93%	2.2E+00	1.4E-03	2.2E+00
PFOA	9.5E-02	1.6E-04	1.6E-04	1.0E-06	100%	1.9E-05	1.2E-08	100%	1.2E-01	7.3E-05	1.2E-01
										Total HI	2.3



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	On-Base	Construction Worker
Pathway:	Direct Contact (Dermal / Ingestion / Inhalation) with Soils	
Source:	SL02	On-Base Soil to 3m
Scenario ID:	7	SL02NE(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Adult	Adult	Adult	Adult
Exposure Duration (ED)	years	1	1	1	1
Exposure Frequency (EF)	days/year	40	80	80	80
Exposure Time (ET)	hours/day	8	10	10	10
Averaging Time (AT)	years	1	1	1	1
Event Frequency (EV)	events/day	1	1	1	1
Body Weight (BW)	kg	75	70	70	70
Soil Ingestion Rate (IR)	mg/day	50	330	330	330
Exposed Skin Area (SA)	cm ²	6300	7900	7900	7900
Soil Adherence (AD)	mg/cm ²	0.1	0.3	0.3	0.3
		Soil	Soil	Soil	Soil
Particulate Retention (PR)	unitless	0.378	0.378	0.378	0.378
Particle Emission Factor (PEF)	m ³ /kg	6.60E+08	6.60E+08	6.60E+08	6.60E+08

Contaminant	Soil Concentration mg/kg	Toxicity Criteria			Absorption Factor (ABS)		Bioavailability (Bo)	Estimated Intake Dose			% TDI Allocated to Contaminated Sites	Estimated HQ			Combined HQ
		TDI (mg/kg-day)		TC (mg/m ³)	Inhalation (unitless)	Dermal (unitless)		CDI (mg/kg-day)		EC (mg/m ³)		Soil Ingestion	Dermal	Particulates Inhalation	
		Oral	Dermal	Particulate Inhalation				Soil Ingestion	Dermal	Particulates Inhalation					
Adult - Typical Exposure															
PFOS + PFHxS	3.0E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	2.2E-07	1.4E-09	6.3E-11	93%	1.2E-02	7.4E-05	9.6E-07	1.2E-02
PFOA	2.7E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	2.0E-09	1.2E-11	5.6E-13	100%	1.2E-05	7.8E-08	1.0E-09	1.2E-05
Total HI															0.012
Adult - Upper Exposure															
PFOS + PFHxS	7.9E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	8.2E-06	2.9E-08	4.1E-10	93%	4.4E-01	1.6E-03	6.3E-06	4.4E-01
PFOA	5.7E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	5.9E-08	2.1E-10	3.0E-12	100%	3.7E-04	1.3E-06	5.3E-09	3.7E-04
Total HI															0.44



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	On-Base	Construction Worker
Pathway:	Direct Contact	(Dermal / Ingestion) with Groundwater
Source:	GW01	On-Base Groundwater
Scenario ID:	8	GW01NE(dc)

Parameters	Units	Typical Exposure	Upper Estimate Exposure
		Adult	Adult
Exposure Duration (ED)	years	1	1
Exposure Frequency (EF)	days/year	40	80
Exposure Time (ET)	hours/day	8	10
Averaging Time (AT)	years	1	1
Body Weight (BW)	kg	75	70
Exposed Skin Area (SA)	cm ²	6300	7900
Incidental Ingestion Rate (IR)	L/hr	0.0025	0.0125

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	2.3E-01	2.0E-05	2.0E-05	1.0E-06	100%	6.7E-06	1.7E-08	93%	3.6E-01	9.1E-04	3.6E-01
PFOA	2.9E-03	1.6E-04	1.6E-04	1.0E-06	100%	8.5E-08	2.1E-10	100%	5.3E-04	1.3E-06	5.3E-04
									Total HI		0.36
Adult - Upper Exposure											
PFOS + PFHxS	4.3E-01	2.0E-05	2.0E-05	1.0E-06	100%	1.7E-04	1.1E-07	93%	9.0E+00	5.7E-03	9.1E+00
PFOA	5.6E-03	1.6E-04	1.6E-04	1.0E-06	100%	2.2E-06	1.4E-09	100%	1.4E-02	8.7E-06	1.4E-02
									Total HI		9.1



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	On-Base	Residential Occupant
Pathway:	Dust Inhalation	
Source:	SS01	On-Base Surface Soils
Scenario ID:	9	SS01NR(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	365	365	365	365
Exposure Time (ET)	hours/day	3	3	4	4
Averaging Time (AT)	years	6	10	6	35
Event Frequency (EV)	events/day	NA	NA	NA	NA
Body Weight (BW)	kg	15	75	15	70
Soil Ingestion Rate (IR)	mg/day	NA	NA	NA	NA
Exposed Skin Area (SA)	cm ²	NA	NA	NA	NA
Soil Adherence (AD)	mg/cm ²	NA	NA	NA	NA
		Soil		Soil	
Particulate Retention (PR)	unitless	0.375		0.375	
Particle Emission Factor (PEF)	m ³ /kg	6.60E+08		6.60E+08	

Contaminant	Soil Concentration mg/kg	Toxicity Criteria			Absorption Factor (ABS)	Bioavailability (Bo)	Estimated Intake Dose			% TDI Allocated to Contaminated Sites	Estimated HQ			Combined HQ	
		TDI (mg/kg-day)		TC (mg/m ³)			CDI (mg/kg-day)		EC (mg/m ³)		Soil Ingestion	Dermal	Particulates Inhalation		
		Oral	Dermal	Particulate Inhalation			Inhalation (unitless)	Dermal (unitless)							
Adult - Typical Exposure															
PFOS + PFHxS	3.2E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	NA	NA	2.3E-10	93%	NA	NA	3.5E-06	3.5E-06
PFOA	2.7E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	NA	NA	1.9E-12	100%	NA	NA	3.4E-09	3.4E-09
														Total HI	0.0000035
Adult - Upper Exposure															
PFOS + PFHxS	8.4E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	NA	NA	8.0E-10	93%	NA	NA	1.2E-05	1.2E-05
PFOA	5.9E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	NA	NA	5.6E-12	100%	NA	NA	1.0E-08	1.0E-08
														Total HI	0.000012
Child - Typical Exposure															
PFOS + PFHxS	3.2E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	NA	NA	2.3E-10	93%	NA	NA	3.5E-06	3.5E-06
PFOA	2.7E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	NA	NA	1.9E-12	100%	NA	NA	3.4E-09	3.4E-09
														Total HI	0.0000035
Child - Upper Exposure															
PFOS + PFHxS	8.4E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	NA	NA	8.0E-10	93%	NA	NA	1.2E-05	1.2E-05
PFOA	5.9E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	NA	NA	5.6E-12	100%	NA	NA	1.0E-08	1.0E-08
														Total HI	0.000012



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Commercial/Industrial Worker
Pathway:	Dust Inhalation	
Source:	SS01	On-Base Surface Soils
Scenario ID:	10	SS01FC(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Adult	Adult	Adult	Adult
Exposure Duration (ED)	years	10	10	30	30
Exposure Frequency (EF)	days/year	240	240	240	240
Exposure Time (ET)	hours/day	1	1	8	8
Averaging Time (AT)	years	10	10	30	30
Event Frequency (EV)	events/day	NA	NA	NA	NA
Body Weight (BW)	kg	75	75	70	70
Soil Ingestion Rate (IR)	mg/day	NA	NA	NA	NA
Exposed Skin Area (SA)	cm ²	NA	NA	NA	NA
Soil Adherence (AD)	mg/cm ²	NA	NA	NA	NA
		Soil	Soil	Soil	Soil
Particulate Retention (PR)	unitless	0.375	0.375	0.375	0.375
Particle Emission Factor (PEF)	m ³ /kg	6.60E+08	6.60E+08	6.60E+08	6.60E+08

Contaminant	Soil Concentration mg/kg	Toxicity Criteria			Absorption Factor (ABS)		Bioavailability (Bo)	Estimated Intake Dose			% TDI Allocated to Contaminated Sites	Estimated HQ			Combined HQ
		TDI (mg/kg-day)		TC (mg/m ³)	Inhalation (unitless)	Dermal (unitless)		CDI (mg/kg-day)		EC (mg/m ³)		Soil Ingestion	Dermal	Particulates Inhalation	
		Oral	Dermal	Particulate Inhalation				Soil Ingestion	Dermal	Particulates Inhalation					
Adult - Typical Exposure															
PFOS + PFHxS	3.2E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	NA	NA	5.0E-11	93%	NA	NA	7.7E-07	7.7E-07
PFOA	2.7E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	NA	NA	4.2E-13	100%	NA	NA	7.5E-10	7.5E-10
														Total HI	0.0000077
Adult - Upper Exposure															
PFOS + PFHxS	8.4E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	NA	NA	1.0E-09	93%	NA	NA	1.6E-05	1.6E-05
PFOA	5.9E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	NA	NA	7.3E-12	100%	NA	NA	1.3E-08	1.3E-08
														Total HI	0.000016



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Maintenance/Subsurface Worker
Pathway:	Dust Inhalation	
Source:	SS01	On-Base Surface Soils
Scenario ID:	11	SS01FT(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Adult	Adult	Adult	Adult
Exposure Duration (ED)	years	10	10	30	30
Exposure Frequency (EF)	days/year	20	20	40	40
Exposure Time (ET)	hours/day	8	8	10	10
Averaging Time (AT)	years	10	10	30	30
Event Frequency (EV)	events/day	NA	NA	NA	NA
Body Weight (BW)	kg	75	75	70	70
Soil Ingestion Rate (IR)	mg/day	NA	NA	NA	NA
Exposed Skin Area (SA)	cm ²	NA	NA	NA	NA
Soil Adherence (AD)	mg/cm ²	NA	NA	NA	NA
Particulate Retention (PR)	unitless	0.375	0.375	0.375	0.375
Particle Emission Factor (PEF)	m ³ /kg	6.60E+08	6.60E+08	6.60E+08	6.60E+08

Contaminant	Soil Concentration mg/kg	Toxicity Criteria			Absorption Factor (ABS)		Bioavailability (Bo)	Estimated Intake Dose			% TDI Allocated to Contaminated Sites	Estimated HQ			Combined HQ
		TDI (mg/kg-day)		TC (mg/m ³)	Inhalation (unitless)	Dermal (unitless)		CDI (mg/kg-day)		EC (mg/m ³)		Soil Ingestion	Dermal	Particulates Inhalation	
		Oral	Dermal	Particulate Inhalation				Soil Ingestion	Dermal	Particulates Inhalation					
Adult - Typical Exposure															
PFOS + PFHxS	3.2E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	NA	NA	3.3E-11	93%	NA	NA	5.1E-07	5.1E-07
PFOA	2.7E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	NA	NA	2.8E-13	100%	NA	NA	5.0E-10	5.0E-10
														Total HI	0.0000051
Adult - Upper Exposure															
PFOS + PFHxS	8.4E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	NA	NA	2.2E-10	93%	NA	NA	3.3E-06	3.3E-06
PFOA	5.9E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	NA	NA	1.5E-12	100%	NA	NA	2.7E-09	2.7E-09
														Total HI	0.0000034



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Maintenance/Subsurface Worker
Pathway:	Direct Contact	(Dermal / Ingestion) with Groundwater
Source:	GW07	On-Base Groundwater (<1mbgs)
Scenario ID:	12	GW07FT(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Adult	Adult	Adult	Adult
Exposure Duration (ED)	years	10		30	
Exposure Frequency (EF)	days/year	20		40	
Exposure Time (ET)	hours/day	8		10	
Averaging Time (AT)	years	10		30	
Body Weight (BW)	kg	75		70	
Exposed Skin Area (SA)	cm ²	6300		7900	
Incidental Ingestion Rate (IR)	L/hr	0.0025		0.0125	

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	3.5E-02	2.0E-05	2.0E-05	1.0E-06	100%	5.1E-07	1.3E-09	93%	2.7E-02	6.9E-05	2.8E-02
PFOA	5.8E-04	1.6E-04	1.6E-04	1.0E-06	100%	8.5E-09	2.1E-11	100%	5.3E-05	1.3E-07	5.3E-05
										Total HI	0.028
Adult - Upper Exposure											
PFOS + PFHxS	3.7E-02	2.0E-05	2.0E-05	1.0E-06	100%	7.2E-06	4.6E-09	93%	3.9E-01	2.5E-04	3.9E-01
PFOA	5.9E-04	1.6E-04	1.6E-04	1.0E-06	100%	1.2E-07	7.3E-11	100%	7.2E-04	4.6E-07	7.2E-04
										Total HI	0.39



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Maintenance/Subsurface Worker
Pathway:	Direct Contact	(Dermal / Ingestion) with Surface Water
Source:	SW02	Off-Base Surface Waters (DIA)
Scenario ID:	13	SW02FT(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Adult	Adult	Adult	Adult
Exposure Duration (ED)	years	10		30	
Exposure Frequency (EF)	days/year	20		40	
Exposure Time (ET)	hours/day	8		10	
Averaging Time (AT)	years	10		30	
Body Weight (BW)	kg	75		70	
Exposed Skin Area (SA)	cm ²	6300		7900	
Incidental Ingestion Rate (IR)	L/hr	0.0025		0.0125	

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	1.2E-03	2.0E-05	2.0E-05	1.0E-06	100%	1.8E-08	4.4E-11	93%	9.4E-04	2.4E-06	9.5E-04
PFOA	2.9E-05	1.6E-04	1.6E-04	1.0E-06	100%	4.2E-10	1.1E-12	100%	2.6E-06	6.7E-09	2.7E-06
										Total HI	0.0009
Adult - Upper Exposure											
PFOS + PFHxS	1.5E-03	2.0E-05	2.0E-05	1.0E-06	100%	2.9E-07	1.9E-10	93%	1.6E-02	1.0E-05	1.6E-02
PFOA	5.1E-05	1.6E-04	1.6E-04	1.0E-06	100%	1.0E-08	6.3E-12	100%	6.2E-05	3.9E-08	6.2E-05
										Total HI	0.016



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Maintenance/Subsurface Worker
Pathway:	Direct Contact	(Dermal / Ingestion) with Surface Water
Source:	SW03	Off-Base Surface Waters (L1A)
Scenario ID:	14	SW03FT(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Adult	Adult	Adult	Adult
Exposure Duration (ED)	years	10	30		
Exposure Frequency (EF)	days/year	20	40		
Exposure Time (ET)	hours/day	8	10		
Averaging Time (AT)	years	10	30		
Body Weight (BW)	kg	75	70		
Exposed Skin Area (SA)	cm ²	6300	7900		
Incidental Ingestion Rate (IR)	L/hr	0.0025	0.0125		

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	4.8E-03	2.0E-05	2.0E-05	1.0E-06	100%	7.0E-08	1.8E-10	93%	3.8E-03	9.5E-06	3.8E-03
PFOA	7.9E-05	1.6E-04	1.6E-04	1.0E-06	100%	1.2E-09	2.9E-12	100%	7.2E-06	1.8E-08	7.2E-06
										Total HI	0.0038
Adult - Upper Exposure											
PFOS + PFHxS	6.1E-03	2.0E-05	2.0E-05	1.0E-06	100%	1.2E-06	7.5E-10	93%	6.4E-02	4.1E-05	6.4E-02
PFOA	1.0E-04	1.6E-04	1.6E-04	1.0E-06	100%	2.0E-08	1.2E-11	100%	1.2E-04	7.7E-08	1.2E-04
										Total HI	0.064



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Construction Worker
Pathway:	Dust Inhalation	
Source:	SS01	On-Base Surface Soils
Scenario ID:	15	SS01FE(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Adult	Adult	Adult	Adult
Exposure Duration (ED)	years	1	1	1	1
Exposure Frequency (EF)	days/year	40	80	80	80
Exposure Time (ET)	hours/day	8	10	10	10
Averaging Time (AT)	years	1	1	1	1
Event Frequency (EV)	events/day	NA	NA	NA	NA
Body Weight (BW)	kg	75	70	70	70
Soil Ingestion Rate (IR)	mg/day	NA	NA	NA	NA
Exposed Skin Area (SA)	cm ²	NA	NA	NA	NA
Soil Adherence (AD)	mg/cm ²	NA	NA	NA	NA
		Soil	Soil	Soil	Soil
Particulate Retention (PR)	unitless	0.378	0.378	0.378	0.378
Particle Emission Factor (PEF)	m ³ /kg	6.60E+08	6.60E+08	6.60E+08	6.60E+08

Contaminant	Soil Concentration mg/kg	Toxicity Criteria			Absorption Factor (ABS)		Bioavailability (Bo)	Estimated Intake Dose			% TDI Allocated to Contaminated Sites	Estimated HQ			Combined HQ
		TDI (mg/kg-day)		TC (mg/m ³)	Inhalation (unitless)	Dermal (unitless)		CDI (mg/kg-day)		EC (mg/m ³)		Soil Ingestion	Dermal	Particulates Inhalation	
		Oral	Dermal	Particulate Inhalation				Soil Ingestion	Dermal						
Adult - Typical Exposure															
PFOS + PFHxS	3.2E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	NA	NA	6.7E-11	93%	NA	NA	1.0E-06	1.0E-06
PFOA	2.7E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	NA	NA	5.6E-13	100%	NA	NA	1.0E-09	1.0E-09
														Total HI	0.000010
Adult - Upper Exposure															
PFOS + PFHxS	8.4E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	NA	NA	4.4E-10	93%	NA	NA	6.7E-06	6.7E-06
PFOA	5.9E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	NA	NA	3.1E-12	100%	NA	NA	5.5E-09	5.5E-09
														Total HI	0.000068



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Construction Worker
Pathway:	Direct Contact	(Dermal / Ingestion) with Groundwater
Source:	GW02	Off-Base DIA Groundwater
Scenario ID:	16	GW02FE(dc)

Parameters	Units	Typical Exposure	Upper Estimate Exposure
		Adult	Adult
Exposure Duration (ED)	years	1	1
Exposure Frequency (EF)	days/year	40	80
Exposure Time (ET)	hours/day	8	10
Averaging Time (AT)	years	1	1
Body Weight (BW)	kg	75	70
Exposed Skin Area (SA)	cm ²	6300	7900
Incidental Ingestion Rate (IR)	L/hr	0.0025	0.0125

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	4.4E-02	2.0E-05	2.0E-05	1.0E-06	100%	1.3E-06	3.2E-09	93%	6.9E-02	1.7E-04	6.9E-02
PFOA	4.6E-03	1.6E-04	1.6E-04	1.0E-06	100%	1.3E-07	3.4E-10	100%	8.4E-04	2.1E-06	8.4E-04
										Total HI	0.070
Adult - Upper Exposure											
PFOS + PFHxS	5.9E-02	2.0E-05	2.0E-05	1.0E-06	100%	2.3E-05	1.5E-08	93%	1.2E+00	7.8E-04	1.2E+00
PFOA	5.5E-03	1.6E-04	1.6E-04	1.0E-06	100%	2.2E-06	1.4E-09	100%	1.3E-02	8.5E-06	1.3E-02
										Total HI	1.3



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Construction Worker
Pathway:	Direct Contact	(Dermal / Ingestion) with Groundwater
Source:	GW03	Off-Base / Boundary Groundwater
Scenario ID:	17	GW03FE(dc)

Parameters	Units	Typical Exposure	Upper Estimate Exposure
		Adult	Adult
Exposure Duration (ED)	years	1	1
Exposure Frequency (EF)	days/year	40	80
Exposure Time (ET)	hours/day	8	10
Averaging Time (AT)	years	1	1
Body Weight (BW)	kg	75	70
Exposed Skin Area (SA)	cm ²	6300	7900
Incidental Ingestion Rate (IR)	L/hr	0.0025	0.0125

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	8.9E-03	2.0E-05	2.0E-05	1.0E-06	100%	2.6E-07	6.6E-10	93%	1.4E-02	3.5E-05	1.4E-02
PFOA	1.3E-04	1.6E-04	1.6E-04	1.0E-06	100%	3.8E-09	9.6E-12	100%	2.4E-05	6.0E-08	2.4E-05
										Total HI	0.014
Adult - Upper Exposure											
PFOS + PFHxS	1.0E-02	2.0E-05	2.0E-05	1.0E-06	100%	3.9E-06	2.5E-09	93%	2.1E-01	1.3E-04	2.1E-01
PFOA	1.4E-04	1.6E-04	1.6E-04	1.0E-06	100%	5.5E-08	3.5E-11	100%	3.4E-04	2.2E-07	3.4E-04
										Total HI	0.21



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Residential Occupant
Pathway:	Dust Inhalation	
Source:	SS01	On-Base Surface Soils
Scenario ID:	18	SS01FR(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	365	365	365	365
Exposure Time (ET)	hours/day	3	3	4	4
Averaging Time (AT)	years	6	10	6	35
Event Frequency (EV)	events/day	NA	NA	NA	NA
Body Weight (BW)	kg	15	75	15	70
Soil Ingestion Rate (IR)	mg/day	NA	NA	NA	NA
Exposed Skin Area (SA)	cm ²	NA	NA	NA	NA
Soil Adherence (AD)	mg/cm ²	NA	NA	NA	NA
		Soil		Soil	
Particulate Retention (PR)	unitless	0.375		0.375	
Particle Emission Factor (PEF)	m ³ /kg	6.60E+08		6.60E+08	

Contaminant	Soil Concentration mg/kg	Toxicity Criteria			Absorption Factor (ABS)		Bioavailability (Bo)	Estimated Intake Dose			% TDI Allocated to Contaminated Sites	Estimated HQ			Combined HQ
		TDI (mg/kg-day)		TC (mg/m ³)	Inhalation (unitless)	Dermal (unitless)		CDI (mg/kg-day)		EC (mg/m ³)		Soil Ingestion	Dermal	Particulates Inhalation	
		Oral	Dermal	Particulate Inhalation				Soil Ingestion	Dermal	Particulates Inhalation					
Adult - Typical Exposure															
PFOS + PFHxS	3.2E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	NA	NA	2.3E-10	93%	NA	NA	3.5E-06	3.5E-06
PFOA	2.7E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	NA	NA	1.9E-12	100%	NA	NA	3.4E-09	3.4E-09
														Total HI	0.0000035
Adult - Upper Exposure															
PFOS + PFHxS	8.4E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	NA	NA	8.0E-10	93%	NA	NA	1.2E-05	1.2E-05
PFOA	5.9E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	NA	NA	5.6E-12	100%	NA	NA	1.0E-08	1.0E-08
														Total HI	0.000012
Child - Typical Exposure															
PFOS + PFHxS	3.2E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	NA	NA	2.3E-10	93%	NA	NA	3.5E-06	3.5E-06
PFOA	2.7E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	NA	NA	1.9E-12	100%	NA	NA	3.4E-09	3.4E-09
														Total HI	0.0000035
Child - Upper Exposure															
PFOS + PFHxS	8.4E+00	2.0E-05	2.0E-05	7.0E-05	1.0E+00	5.0E-04	100%	NA	NA	8.0E-10	93%	NA	NA	1.2E-05	1.2E-05
PFOA	5.9E-02	1.6E-04	1.6E-04	5.6E-04	1.0E+00	5.0E-04	100%	NA	NA	5.6E-12	100%	NA	NA	1.0E-08	1.0E-08
														Total HI	0.000012



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base Residential Occupant
Pathway:	Direct Contact (Dermal / Ingestion) with Groundwater used to fill a Swimming Pool
Source:	GW04 Bagot Groundwater
Scenario ID:	19 GW04FR(dc-sw)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	52	52	150	150
Exposure Time (ET)	hours/day	0.5	0.5	1.5	1.5
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Exposed Skin Area (SA)	cm ²	6100	20000	7000	24000
Incidental Ingestion Rate (IR)	L/hr	0.05	0.025	0.15	0.125

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	8.9E-03	2.0E-05	2.0E-05	1.0E-06	100%	2.1E-07	1.7E-10	93%	1.1E-02	9.1E-06	1.1E-02
PFOA	1.3E-04	1.6E-04	1.6E-04	1.0E-06	100%	3.1E-09	2.5E-12	100%	1.9E-05	1.5E-08	1.9E-05
									Total HI		0.011
Adult - Upper Exposure											
PFOS + PFHxS	1.0E-02	2.0E-05	2.0E-05	1.0E-06	100%	1.1E-05	2.1E-09	93%	5.9E-01	1.1E-04	5.9E-01
PFOA	1.4E-04	1.6E-04	1.6E-04	1.0E-06	100%	1.5E-07	3.0E-11	100%	9.6E-04	1.8E-07	9.6E-04
									Total HI		0.59
Child - Typical Exposure											
PFOS + PFHxS	8.9E-03	2.0E-05	2.0E-05	1.0E-06	100%	2.1E-06	2.6E-10	93%	1.1E-01	1.4E-05	1.1E-01
PFOA	1.3E-04	1.6E-04	1.6E-04	1.0E-06	100%	3.1E-08	3.8E-12	100%	1.9E-04	2.4E-08	1.9E-04
									Total HI		0.11
Child - Upper Exposure											
PFOS + PFHxS	1.0E-02	2.0E-05	2.0E-05	1.0E-06	100%	6.2E-05	2.9E-09	93%	3.3E+00	1.5E-04	3.3E+00
PFOA	1.4E-04	1.6E-04	1.6E-04	1.0E-06	100%	8.6E-07	4.0E-11	100%	5.4E-03	2.5E-07	5.4E-03
									Total HI		3.3



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base Residential Occupant
Pathway:	Direct Contact (Dermal / Ingestion) with Groundwater during Sprinkler Play
Source:	GW04 Bagot Groundwater
Scenario ID:	20 GW04FR(dc-sp)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	52	52	150	150
Exposure Time (ET)	hours/day	0.5	0.5	1.5	1.5
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Exposed Skin Area (SA)	cm ²	6100	20000	7000	24000
Incidental Ingestion Rate (IR)	L/hr	0.025	0.0125	0.075	0.0625

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	8.9E-03	2.0E-05	2.0E-05	1.0E-06	100%	1.1E-07	1.7E-10	93%	5.7E-03	9.1E-06	5.7E-03
PFOA	1.3E-04	1.6E-04	1.6E-04	1.0E-06	100%	1.5E-09	2.5E-12	100%	9.6E-06	1.5E-08	9.7E-06
									Total HI		0.0057
Adult - Upper Exposure											
PFOS + PFHxS	1.0E-02	2.0E-05	2.0E-05	1.0E-06	100%	5.5E-06	2.1E-09	93%	3.0E-01	1.1E-04	3.0E-01
PFOA	1.4E-04	1.6E-04	1.6E-04	1.0E-06	100%	7.7E-08	3.0E-11	100%	4.8E-04	1.8E-07	4.8E-04
									Total HI		0.30
Child - Typical Exposure											
PFOS + PFHxS	8.9E-03	2.0E-05	2.0E-05	1.0E-06	100%	1.1E-06	2.6E-10	93%	5.7E-02	1.4E-05	5.7E-02
PFOA	1.3E-04	1.6E-04	1.6E-04	1.0E-06	100%	1.5E-08	3.8E-12	100%	9.6E-05	2.4E-08	9.6E-05
									Total HI		0.057
Child - Upper Exposure											
PFOS + PFHxS	1.0E-02	2.0E-05	2.0E-05	1.0E-06	100%	3.1E-05	2.9E-09	93%	1.7E+00	1.5E-04	1.7E+00
PFOA	1.4E-04	1.6E-04	1.6E-04	1.0E-06	100%	4.3E-07	4.0E-11	100%	2.7E-03	2.5E-07	2.7E-03
									Total HI		1.7



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base Residential Occupant
Pathway:	Direct Contact (Dermal / Ingestion) with Groundwater used to fill a Swimming Pool
Source:	GW05 Narrows Groundwater
Scenario ID:	21 GW05FR(dc-sw)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	52	52	150	150
Exposure Time (ET)	hours/day	0.5	0.5	1.5	1.5
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Exposed Skin Area (SA)	cm ²	6100	20000	7000	24000
Incidental Ingestion Rate (IR)	L/hr	0.05	0.025	0.15	0.125

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	3.1E-04	2.0E-05	2.0E-05	1.0E-06	100%	7.4E-09	5.9E-12	93%	4.0E-04	3.2E-07	4.0E-04
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	1.2E-10	9.5E-14	100%	7.4E-07	5.9E-10	7.4E-07
										Total HI	0.00040
Adult - Upper Exposure											
PFOS + PFHxS	3.1E-04	2.0E-05	2.0E-05	1.0E-06	100%	3.4E-07	6.6E-11	93%	1.8E-02	3.5E-06	1.8E-02
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	5.5E-09	1.1E-12	100%	3.4E-05	6.6E-09	3.4E-05
										Total HI	0.018
Child - Typical Exposure											
PFOS + PFHxS	3.1E-04	2.0E-05	2.0E-05	1.0E-06	100%	7.4E-08	9.0E-12	93%	4.0E-03	4.8E-07	4.0E-03
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	1.2E-09	1.4E-13	100%	7.4E-06	9.1E-10	7.4E-06
										Total HI	0.0040
Child - Upper Exposure											
PFOS + PFHxS	3.1E-04	2.0E-05	2.0E-05	1.0E-06	100%	1.9E-06	8.9E-11	93%	1.0E-01	4.8E-06	1.0E-01
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	3.1E-08	1.4E-12	100%	1.9E-04	9.0E-09	1.9E-04
										Total HI	0.10



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base Residential Occupant
Pathway:	Direct Contact (Dermal / Ingestion) with Groundwater during Sprinkler Play
Source:	GW05 Narrows Groundwater
Scenario ID:	22 GW05FR(dc-sp)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	52	52	150	150
Exposure Time (ET)	hours/day	0.5	0.5	1.5	1.5
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Exposed Skin Area (SA)	cm ²	6100	20000	7000	24000
Incidental Ingestion Rate (IR)	L/hr	0.025	0.0125	0.075	0.0625

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	3.1E-04	2.0E-05	2.0E-05	1.0E-06	100%	3.7E-09	5.9E-12	93%	2.0E-04	3.2E-07	2.0E-04
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	5.9E-11	9.5E-14	100%	3.7E-07	5.9E-10	3.7E-07
									Total HI		0.00020
Adult - Upper Exposure											
PFOS + PFHxS	3.1E-04	2.0E-05	2.0E-05	1.0E-06	100%	1.7E-07	6.6E-11	93%	9.2E-03	3.5E-06	9.2E-03
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	2.8E-09	1.1E-12	100%	1.7E-05	6.6E-09	1.7E-05
									Total HI		0.0092
Child - Typical Exposure											
PFOS + PFHxS	3.1E-04	2.0E-05	2.0E-05	1.0E-06	100%	3.7E-08	9.0E-12	93%	2.0E-03	4.8E-07	2.0E-03
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	5.9E-10	1.4E-13	100%	3.7E-06	9.1E-10	3.7E-06
									Total HI		0.0020
Child - Upper Exposure											
PFOS + PFHxS	3.1E-04	2.0E-05	2.0E-05	1.0E-06	100%	9.6E-07	8.9E-11	93%	5.1E-02	4.8E-06	5.1E-02
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	1.5E-08	1.4E-12	100%	9.6E-05	9.0E-09	9.6E-05
									Total HI		0.051



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base Residential Occupant
Pathway:	Direct Contact (Dermal / Ingestion) with Groundwater used to fill a Swimming Pool
Source:	GW06 Off-Base North Groundwater
Scenario ID:	23 GW06FR(dc-sw)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	52	52	150	150
Exposure Time (ET)	hours/day	0.5	0.5	1.5	1.5
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Exposed Skin Area (SA)	cm ²	6100	20000	7000	24000
Incidental Ingestion Rate (IR)	L/hr	0.05	0.025	0.15	0.125

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	8.0E-05	2.0E-05	2.0E-05	1.0E-06	100%	1.9E-09	1.5E-12	93%	1.0E-04	8.2E-08	1.0E-04
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	1.2E-10	9.5E-14	100%	7.4E-07	5.9E-10	7.4E-07
										Total HI	0.00010
Adult - Upper Exposure											
PFOS + PFHxS	8.0E-05	2.0E-05	2.0E-05	1.0E-06	100%	8.8E-08	1.7E-11	93%	4.7E-03	9.1E-07	4.7E-03
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	5.5E-09	1.1E-12	100%	3.4E-05	6.6E-09	3.4E-05
										Total HI	0.0048
Child - Typical Exposure											
PFOS + PFHxS	8.0E-05	2.0E-05	2.0E-05	1.0E-06	100%	1.9E-08	2.3E-12	93%	1.0E-03	1.2E-07	1.0E-03
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	1.2E-09	1.4E-13	100%	7.4E-06	9.1E-10	7.4E-06
										Total HI	0.0010
Child - Upper Exposure											
PFOS + PFHxS	8.0E-05	2.0E-05	2.0E-05	1.0E-06	100%	4.9E-07	2.3E-11	93%	2.7E-02	1.2E-06	2.7E-02
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	3.1E-08	1.4E-12	100%	1.9E-04	9.0E-09	1.9E-04
										Total HI	0.027



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Other	Other
Pathway:	Direct Contact	(Dermal / Ingestion) with Groundwater during Sprinkler Play
Source:	GW06	Off-Base North Groundwater
Scenario ID:	24	GW06R(dc-sp)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	52	52	150	150
Exposure Time (ET)	hours/day	0.5	0.5	1.5	1.5
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Exposed Skin Area (SA)	cm ²	6100	20000	7000	24000
Incidental Ingestion Rate (IR)	L/hr	0.025	0.0125	0.075	0.0625

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	8.0E-05	2.0E-05	2.0E-05	1.0E-06	100%	9.5E-10	1.5E-12	93%	5.1E-05	8.2E-08	5.1E-05
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	5.9E-11	9.5E-14	100%	3.7E-07	5.9E-10	3.7E-07
									Total HI		0.000052
Adult - Upper Exposure											
PFOS + PFHxS	8.0E-05	2.0E-05	2.0E-05	1.0E-06	100%	4.4E-08	1.7E-11	93%	2.4E-03	9.1E-07	2.4E-03
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	2.8E-09	1.1E-12	100%	1.7E-05	6.6E-09	1.7E-05
									Total HI		0.0024
Child - Typical Exposure											
PFOS + PFHxS	8.0E-05	2.0E-05	2.0E-05	1.0E-06	100%	9.5E-09	2.3E-12	93%	5.1E-04	1.2E-07	5.1E-04
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	5.9E-10	1.4E-13	100%	3.7E-06	9.1E-10	3.7E-06
									Total HI		0.00051
Child - Upper Exposure											
PFOS + PFHxS	8.0E-05	2.0E-05	2.0E-05	1.0E-06	100%	2.5E-07	2.3E-11	93%	1.3E-02	1.2E-06	1.3E-02
PFOA	5.0E-06	1.6E-04	1.6E-04	1.0E-06	100%	1.5E-08	1.4E-12	100%	9.6E-05	9.0E-09	9.6E-05
									Total HI		0.013



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Residential Occupant
Pathway:	Ingestion of Terrestrial Biota	
Source:	TB03	Off-Base Eggs
Scenario ID:	27	TB03FR(ing)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	365	365	365	365
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Biota Ingestion Rate (IR)	g/day	13	23	36	59
Contaminated fraction of food group ingested (FI)	%	50%	50%	100%	100%

Contaminant	Biota Concentration mg/kg	Oral Toxicity Criteria TDI (mg/kg-day)	Bioavailability (Bo)	Estimated Intake Dose CDI (mg/kg-day)	% TDI Allocated to Contaminated Sites	Estimated HQ
Adult - Typical Exposure						
PFOS + PFHxS	3.9E-02	2.0E-05	100%	6.0E-06	93%	3.2E-01
PFOA	1.0E-03	1.6E-04	100%	1.5E-07	100%	9.6E-04
Total HI						0.32
Adult - Upper Exposure						
PFOS + PFHxS	4.8E-02	2.0E-05	100%	4.0E-05	93%	2.2E+00
PFOA	1.0E-03	1.6E-04	100%	8.4E-07	100%	5.3E-03
Total HI						2.2
Child - Typical Exposure						
PFOS + PFHxS	3.9E-02	2.0E-05	100%	1.7E-05	93%	9.1E-01
PFOA	1.0E-03	1.6E-04	100%	4.3E-07	100%	2.7E-03
Total HI						0.91
Child - Upper Exposure						
PFOS + PFHxS	4.8E-02	2.0E-05	100%	1.2E-04	93%	6.2E+00
PFOA	1.0E-03	1.6E-04	100%	2.4E-06	100%	1.5E-02
Total HI						6.2



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Recreational User
Pathway:	Direct Contact	(Dermal / Ingestion) with Surface Water
Source:	SW04	Ludmilla Creek (Upper)
Scenario ID:	28	SW04FK(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	52	52	150	150
Exposure Time (ET)	hours/day	0.5	0.5	1.5	1.5
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Exposed Skin Area (SA)	cm ²	6100	20000	7000	24000
Incidental Ingestion Rate (IR)	L/hr	0.05	0.025	0.15	0.125

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	3.4E-03	2.0E-05	2.0E-05	1.0E-06	100%	8.1E-08	6.5E-11	93%	4.3E-03	3.5E-06	4.3E-03
PFOA	5.6E-05	1.6E-04	1.6E-04	1.0E-06	100%	1.3E-09	1.1E-12	100%	8.3E-06	6.6E-09	8.3E-06
									Total HI		0.0044
Adult - Upper Exposure											
PFOS + PFHxS	5.4E-03	2.0E-05	2.0E-05	1.0E-06	100%	5.9E-06	1.1E-09	93%	3.2E-01	6.1E-05	3.2E-01
PFOA	7.5E-05	1.6E-04	1.6E-04	1.0E-06	100%	8.3E-08	1.6E-11	100%	5.2E-04	9.9E-08	5.2E-04
									Total HI		0.32
Child - Typical Exposure											
PFOS + PFHxS	3.4E-03	2.0E-05	2.0E-05	1.0E-06	100%	8.1E-07	9.8E-11	93%	4.3E-02	5.3E-06	4.3E-02
PFOA	5.6E-05	1.6E-04	1.6E-04	1.0E-06	100%	1.3E-08	1.6E-12	100%	8.3E-05	1.0E-08	8.3E-05
									Total HI		0.043
Child - Upper Exposure											
PFOS + PFHxS	5.4E-03	2.0E-05	2.0E-05	1.0E-06	100%	3.3E-05	1.6E-09	93%	1.8E+00	8.4E-05	1.8E+00
PFOA	7.5E-05	1.6E-04	1.6E-04	1.0E-06	100%	4.6E-07	2.2E-11	100%	2.9E-03	1.3E-07	2.9E-03
									Total HI		1.8



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Recreational User
Pathway:	Direct Contact	(Dermal / Ingestion) with Surface Water
Source:	SW05	Ludmilla Creek (Estuarine)
Scenario ID:	29	SW05FK(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	52	52	150	150
Exposure Time (ET)	hours/day	0.5	0.5	1.5	1.5
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Exposed Skin Area (SA)	cm ²	6100	20000	7000	24000
Incidental Ingestion Rate (IR)	L/hr	0.05	0.025	0.15	0.125

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	2.9E-04	2.0E-05	2.0E-05	1.0E-06	100%	6.9E-09	5.5E-12	93%	3.7E-04	3.0E-07	3.7E-04
PFOA	8.3E-06	1.6E-04	1.6E-04	1.0E-06	100%	2.0E-10	1.6E-13	100%	1.2E-06	9.9E-10	1.2E-06
										Total HI	0.00037
Adult - Upper Exposure											
PFOS + PFHxS	5.5E-04	2.0E-05	2.0E-05	1.0E-06	100%	6.1E-07	1.2E-10	93%	3.3E-02	6.2E-06	3.3E-02
PFOA	4.0E-05	1.6E-04	1.6E-04	1.0E-06	100%	4.4E-08	8.5E-12	100%	2.8E-04	5.3E-08	2.8E-04
										Total HI	0.033
Child - Typical Exposure											
PFOS + PFHxS	2.9E-04	2.0E-05	2.0E-05	1.0E-06	100%	6.9E-08	8.4E-12	93%	3.7E-03	4.5E-07	3.7E-03
PFOA	8.3E-06	1.6E-04	1.6E-04	1.0E-06	100%	2.0E-09	2.4E-13	100%	1.2E-05	1.5E-09	1.2E-05
										Total HI	0.0037
Child - Upper Exposure											
PFOS + PFHxS	5.5E-04	2.0E-05	2.0E-05	1.0E-06	100%	3.4E-06	1.6E-10	93%	1.8E-01	8.5E-06	1.8E-01
PFOA	4.0E-05	1.6E-04	1.6E-04	1.0E-06	100%	2.5E-07	1.2E-11	100%	1.5E-03	7.2E-08	1.5E-03
										Total HI	0.18



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Recreational User
Pathway:	Direct Contact	(Dermal / Ingestion) with Surface Water
Source:	SW06	Downstream Rapid Creek (Fresh)
Scenario ID:	30	SW06FK(dc)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	52	52	150	150
Exposure Time (ET)	hours/day	0.5	0.5	1.5	1.5
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Exposed Skin Area (SA)	cm ²	6100	20000	7000	24000
Incidental Ingestion Rate (IR)	L/hr	0.05	0.025	0.15	0.125

Contaminant	Source	Toxicity Criteria		Dermal Permeability (DP) cm/hr	Bioavailability (Bo)	Estimated Intake		% TDI Allocated to Contaminated Sites	Estimated HQ		Combined HQ
	Water Concentration mg/L	TDI Oral mg/kg-day	TDI Dermal mg/kg-day			Oral CDI mg/kg-day	Dermal CDI mg/kg-day		Oral	Dermal	
Adult - Typical Exposure											
PFOS + PFHxS	9.2E-04	2.0E-05	2.0E-05	1.0E-06	100%	2.2E-08	1.7E-11	93%	1.2E-03	9.4E-07	1.2E-03
PFOA	2.0E-05	1.6E-04	1.6E-04	1.0E-06	100%	4.7E-10	3.8E-13	100%	3.0E-06	2.4E-09	3.0E-06
									Total HI		0.0012
Adult - Upper Exposure											
PFOS + PFHxS	1.1E-03	2.0E-05	2.0E-05	1.0E-06	100%	1.2E-06	2.3E-10	93%	6.5E-02	1.2E-05	6.5E-02
PFOA	2.2E-05	1.6E-04	1.6E-04	1.0E-06	100%	2.4E-08	4.6E-12	100%	1.5E-04	2.9E-08	1.5E-04
									Total HI		0.065
Child - Typical Exposure											
PFOS + PFHxS	9.2E-04	2.0E-05	2.0E-05	1.0E-06	100%	2.2E-07	2.7E-11	93%	1.2E-02	1.4E-06	1.2E-02
PFOA	2.0E-05	1.6E-04	1.6E-04	1.0E-06	100%	4.7E-09	5.8E-13	100%	3.0E-05	3.6E-09	3.0E-05
									Total HI		0.012
Child - Upper Exposure											
PFOS + PFHxS	1.1E-03	2.0E-05	2.0E-05	1.0E-06	100%	6.8E-06	3.2E-10	93%	3.6E-01	1.7E-05	3.6E-01
PFOA	2.2E-05	1.6E-04	1.6E-04	1.0E-06	100%	1.4E-07	6.3E-12	100%	8.5E-04	4.0E-08	8.5E-04
									Total HI		0.37



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Recreational User
Pathway:	Ingestion of Aquatic Biota	
Source:	AB01	Ludmilla Creek Fish
Scenario ID:	31	AB01FK(ing)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	365	365	365	365
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Biota Ingestion Rate (IR)	g/day	28	56	72	143
Contaminated fraction of food group ingested (F)	%	10%	10%	50%	50%

Contaminant	Biota Concentration mg/kg	Oral Toxicity Criteria TDI (mg/kg-day)	Bioavailability (Bo)	Estimated Intake Dose CDI (mg/kg-day)	% TDI Allocated to Contaminated Sites	Estimated HQ
Adult - Typical Exposure						
PFOS + PFHxS	4.4E-02	2.0E-05	100%	3.3E-06	93%	1.8E-01
PFOA	5.0E-04	1.6E-04	100%	3.7E-08	100%	2.3E-04
Total HI						0.18
Adult - Upper Exposure						
PFOS + PFHxS	8.1E-02	2.0E-05	100%	8.3E-05	93%	4.4E+00
PFOA	9.0E-04	1.6E-04	100%	9.2E-07	100%	5.7E-03
Total HI						4.5
Child - Typical Exposure						
PFOS + PFHxS	4.4E-02	2.0E-05	100%	8.2E-06	93%	4.4E-01
PFOA	5.0E-04	1.6E-04	100%	9.3E-08	100%	5.8E-04
Total HI						0.4
Child - Upper Exposure						
PFOS + PFHxS	8.1E-02	2.0E-05	100%	1.9E-04	93%	1.0E+01
PFOA	9.0E-04	1.6E-04	100%	2.2E-06	100%	1.4E-02
Total HI						10



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Recreational User
Pathway:	Ingestion of Aquatic Biota	
Source:	AB02	Ludmilla Creek Crustaceans
Scenario ID:	32	AB02FK(ing)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	365	365	365	365
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Biota Ingestion Rate (IR)	g/day	8	21	21	63
Contaminated fraction of food group ingested (FI)	%	10%	10%	50%	50%

Contaminant	Biota Concentration mg/kg	Oral Toxicity Criteria TDI (mg/kg-day)	Bioavailability (Bo)	Estimated Intake Dose CDI (mg/kg-day)	% TDI Allocated to Contaminated Sites	Estimated HQ
Adult - Typical Exposure						
PFOS + PFHxS	1.3E-02	2.0E-05	100%	3.6E-07	93%	2.0E-02
PFOA	5.0E-04	1.6E-04	100%	1.4E-08	100%	8.8E-05
Total HI						0.020
Adult - Upper Exposure						
PFOS + PFHxS	1.8E-02	2.0E-05	100%	8.1E-06	93%	4.4E-01
PFOA	5.0E-04	1.6E-04	100%	2.3E-07	100%	1.4E-03
Total HI						0.44
Child - Typical Exposure						
PFOS + PFHxS	1.3E-02	2.0E-05	100%	6.9E-07	93%	3.7E-02
PFOA	5.0E-04	1.6E-04	100%	2.7E-08	100%	1.7E-04
Total HI						0.037
Child - Upper Exposure						
PFOS + PFHxS	1.8E-02	2.0E-05	100%	1.3E-05	93%	6.8E-01
PFOA	5.0E-04	1.6E-04	100%	3.5E-07	100%	2.2E-03
Total HI						0.7



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Recreational User
Pathway:	Ingestion of Aquatic Biota	
Source:	AB03	Ludmilla Creek Molluscs
Scenario ID:	33	AB03FK(ing)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	365	365	365	365
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Biota Ingestion Rate (IR)	g/day	10	9	40	30
Contaminated fraction of food group ingested (FI)	%	10%	10%	50%	50%

Contaminant	Biota Concentration mg/kg	Oral Toxicity Criteria TDI (mg/kg-day)	Bioavailability (Bo)	Estimated Intake Dose CDI (mg/kg-day)	% TDI Allocated to Contaminated Sites	Estimated HQ
Adult - Typical Exposure						
PFOS + PFHxS	2.3E-02	2.0E-05	100%	2.8E-07	93%	1.5E-02
PFOA	6.0E-03	1.6E-04	100%	7.2E-08	100%	4.5E-04
Total HI						0.015
Adult - Upper Exposure						
PFOS + PFHxS	4.0E-02	2.0E-05	100%	8.6E-06	93%	4.6E-01
PFOA	9.0E-03	1.6E-04	100%	1.9E-06	100%	1.2E-02
Total HI						0.5
Child - Typical Exposure						
PFOS + PFHxS	2.3E-02	2.0E-05	100%	1.5E-06	93%	8.2E-02
PFOA	6.0E-03	1.6E-04	100%	4.0E-07	100%	2.5E-03
Total HI						0.08
Child - Upper Exposure						
PFOS + PFHxS	4.0E-02	2.0E-05	100%	5.3E-05	93%	2.9E+00
PFOA	9.0E-03	1.6E-04	100%	1.2E-05	100%	7.5E-02
Total HI						2.9



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Recreational User
Pathway:	Ingestion of Aquatic Biota	
Source:	AB04	Rapid Creek Freshwater Fish
Scenario ID:	34	AB04FK(ing)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	365	365	365	365
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Biota Ingestion Rate (IR)	g/day	28	56	72	143
Contaminated fraction of food group ingested (FI)	%	10%	10%	50%	50%

Contaminant	Biota Concentration mg/kg	Oral Toxicity Criteria TDI (mg/kg-day)	Bioavailability (Bo)	Estimated Intake Dose CDI (mg/kg-day)	% TDI Allocated to Contaminated Sites	Estimated HQ
Adult - Typical Exposure						
PFOS + PFHxS	5.7E-01	2.0E-05	100%	4.3E-05	93%	2.3E+00
PFOA	5.0E-04	1.6E-04	100%	3.7E-08	100%	2.3E-04
Total HI						2.288
Adult - Upper Exposure						
PFOS + PFHxS	7.6E-01	2.0E-05	100%	7.8E-04	93%	4.2E+01
PFOA	5.0E-04	1.6E-04	100%	5.1E-07	100%	3.2E-03
Total HI						41.74
Child - Typical Exposure						
PFOS + PFHxS	5.7E-01	2.0E-05	100%	1.1E-04	93%	5.7E+00
PFOA	5.0E-04	1.6E-04	100%	9.3E-08	100%	5.8E-04
Total HI						5.721
Child - Upper Exposure						
PFOS + PFHxS	7.6E-01	2.0E-05	100%	1.8E-03	93%	9.8E+01
PFOA	5.0E-04	1.6E-04	100%	1.2E-06	100%	7.5E-03
Total HI						98.1



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Recreational User
Pathway:	Ingestion of Aquatic Biota	
Source:	AB05	Rapid Creek Freshwater Crustaceans
Scenario ID:	35	AB05FK(ing)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	365	365	365	365
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Biota Ingestion Rate (IR)	g/day	8	21	21	63
Contaminated fraction of food group ingested (FI)	%	10%	10%	50%	50%

Contaminant	Biota Concentration mg/kg	Oral Toxicity Criteria TDI (mg/kg-day)	Bioavailability (Bo)	Estimated Intake Dose CDI (mg/kg-day)	% TDI Allocated to Contaminated Sites	Estimated HQ
Adult - Typical Exposure						
PFOS + PFHxS	4.7E-02	2.0E-05	100%	1.3E-06	93%	7.1E-02
PFOA	7.0E-04	1.6E-04	100%	2.0E-08	100%	1.2E-04
Total HI						0.071
Adult - Upper Exposure						
PFOS + PFHxS	1.1E-01	2.0E-05	100%	5.0E-05	93%	2.7E+00
PFOA	1.0E-03	1.6E-04	100%	4.5E-07	100%	2.8E-03
Total HI						2.7
Child - Typical Exposure						
PFOS + PFHxS	4.7E-02	2.0E-05	100%	2.5E-06	93%	1.3E-01
PFOA	7.0E-04	1.6E-04	100%	3.7E-08	100%	2.3E-04
Total HI						0.14
Child - Upper Exposure						
PFOS + PFHxS	1.1E-01	2.0E-05	100%	7.7E-05	93%	4.1E+00
PFOA	1.0E-03	1.6E-04	100%	7.0E-07	100%	4.4E-03
Total HI						4.1



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Recreational User
Pathway:	Ingestion of Aquatic Biota	
Source:	AB07	Rapid Creek Estuarine Fish
Scenario ID:	37	AB07FK(ing)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	365	365	365	365
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Biota Ingestion Rate (IR)	g/day	28	56	72	143
Contaminated fraction of food group ingested (FI)	%	10%	10%	50%	50%

Contaminant	Biota Concentration mg/kg	Oral Toxicity Criteria TDI (mg/kg-day)	Bioavailability (Bo)	Estimated Intake Dose CDI (mg/kg-day)	% TDI Allocated to Contaminated Sites	Estimated HQ
Adult - Typical Exposure						
PFOS + PFHxS	2.7E-02	2.0E-05	100%	2.0E-06	93%	1.1E-01
PFOA	5.0E-04	1.6E-04	100%	3.7E-08	100%	2.3E-04
Total HI						0.1
Adult - Upper Exposure						
PFOS + PFHxS	3.2E-02	2.0E-05	100%	3.3E-05	93%	1.8E+00
PFOA	5.0E-04	1.6E-04	100%	5.1E-07	100%	3.2E-03
Total HI						2
Child - Typical Exposure						
PFOS + PFHxS	2.7E-02	2.0E-05	100%	5.0E-06	93%	2.7E-01
PFOA	5.0E-04	1.6E-04	100%	9.3E-08	100%	5.8E-04
Total HI						0.3
Child - Upper Exposure						
PFOS + PFHxS	3.2E-02	2.0E-05	100%	7.7E-05	93%	4.1E+00
PFOA	5.0E-04	1.6E-04	100%	1.2E-06	100%	7.5E-03
Total HI						4



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Recreational User
Pathway:	Ingestion of Aquatic Biota	
Source:	AB08	Rapid Creek Estuarine Crustaceans
Scenario ID:	38	AB08FK(ing)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	365	365	365	365
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Biota Ingestion Rate (IR)	g/day	8	21	21	63
Contaminated fraction of food group ingested (F)	%	10%	10%	50%	50%

Contaminant	Biota Concentration mg/kg	Oral Toxicity Criteria TDI (mg/kg-day)	Bioavailability (Bo)	Estimated Intake Dose CDI (mg/kg-day)	% TDI Allocated to Contaminated Sites	Estimated HQ
Adult - Typical Exposure						
PFOS + PFHxS	1.7E-02	2.0E-05	100%	4.8E-07	93%	2.6E-02
PFOA	5.0E-04	1.6E-04	100%	1.4E-08	100%	8.8E-05
Total HI						0.03
Adult - Upper Exposure						
PFOS + PFHxS	2.3E-02	2.0E-05	100%	1.0E-05	93%	5.6E-01
PFOA	5.0E-04	1.6E-04	100%	2.3E-07	100%	1.4E-03
Total HI						0.6
Child - Typical Exposure						
PFOS + PFHxS	1.7E-02	2.0E-05	100%	9.1E-07	93%	4.9E-02
PFOA	5.0E-04	1.6E-04	100%	2.7E-08	100%	1.7E-04
Total HI						0.05
Child - Upper Exposure						
PFOS + PFHxS	2.3E-02	2.0E-05	100%	1.6E-05	93%	8.7E-01
PFOA	5.0E-04	1.6E-04	100%	3.5E-07	100%	2.2E-03
Total HI						0.9



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Recreational User
Pathway:	Ingestion of Aquatic Biota	
Source:	AB09	Rapid Creek Estuarine Molluscs
Scenario ID:	39	AB09FK(ing)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	365	365	365	365
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Biota Ingestion Rate (IR)	g/day	10	9	40	30
Contaminated fraction of food group ingested (FI)	%	10%	10%	50%	50%

Contaminant	Biota Concentration mg/kg	Oral Toxicity Criteria TDI (mg/kg-day)	Bioavailability (Bo)	Estimated Intake Dose CDI (mg/kg-day)	% TDI Allocated to Contaminated Sites	Estimated HQ
Adult - Typical Exposure						
PFOS + PFHxS	1.1E-02	2.0E-05	100%	1.3E-07	93%	7.1E-03
PFOA	3.0E-03	1.6E-04	100%	3.6E-08	100%	2.3E-04
Total HI						0.007
Adult - Upper Exposure						
PFOS + PFHxS	2.2E-02	2.0E-05	100%	4.7E-06	93%	2.5E-01
PFOA	6.0E-03	1.6E-04	100%	1.3E-06	100%	8.0E-03
Total HI						0.26
Child - Typical Exposure						
PFOS + PFHxS	1.1E-02	2.0E-05	100%	7.3E-07	93%	3.9E-02
PFOA	3.0E-03	1.6E-04	100%	2.0E-07	100%	1.3E-03
Total HI						0.04
Child - Upper Exposure						
PFOS + PFHxS	2.2E-02	2.0E-05	100%	2.9E-05	93%	1.6E+00
PFOA	6.0E-03	1.6E-04	100%	8.0E-06	100%	5.0E-02
Total HI						1.6



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Recreational User
Pathway:	Ingestion of Aquatic Biota	
Source:	AB10	Darwin Harbour Fish
Scenario ID:	40	AB10FK(ing)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	365	365	365	365
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Biota Ingestion Rate (IR)	g/day	28	56	72	143
Contaminated fraction of food group ingested (FI)	%	10%	10%	50%	50%

Contaminant	Biota Concentration mg/kg	Oral Toxicity Criteria TDI (mg/kg-day)	Bioavailability (Bo)	Estimated Intake Dose CDI (mg/kg-day)	% TDI Allocated to Contaminated Sites	Estimated HQ
Adult - Typical Exposure						
PFOS + PFHxS	1.1E-03	2.0E-05	100%	8.2E-08	93%	4.4E-03
PFOA	5.0E-04	1.6E-04	100%	3.7E-08	100%	2.3E-04
Total HI						0.00
Adult - Upper Exposure						
PFOS + PFHxS	1.4E-03	2.0E-05	100%	1.4E-06	93%	7.7E-02
PFOA	5.0E-04	1.6E-04	100%	5.1E-07	100%	3.2E-03
Total HI						0.1
Child - Typical Exposure						
PFOS + PFHxS	1.1E-03	2.0E-05	100%	2.1E-07	93%	1.1E-02
PFOA	5.0E-04	1.6E-04	100%	9.3E-08	100%	5.8E-04
Total HI						0.01
Child - Upper Exposure						
PFOS + PFHxS	1.4E-03	2.0E-05	100%	3.4E-06	93%	1.8E-01
PFOA	5.0E-04	1.6E-04	100%	1.2E-06	100%	7.5E-03
Total HI						0.2



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Recreational User
Pathway:	Ingestion of Aquatic Biota	
Source:	AB11	Darwin Harbour Crustaceans
Scenario ID:	41	AB11FK(ing)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	365	365	365	365
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Biota Ingestion Rate (IR)	g/day	8	21	21	63
Contaminated fraction of food group ingested (FI)	%	10%	10%	50%	50%

Contaminant	Biota Concentration mg/kg	Oral Toxicity Criteria TDI (mg/kg-day)	Bioavailability (Bo)	Estimated Intake Dose CDI (mg/kg-day)	% TDI Allocated to Contaminated Sites	Estimated HQ
Adult - Typical Exposure						
PFOS + PFHxS	9.0E-04	2.0E-05	100%	2.5E-08	93%	1.4E-03
PFOA	5.0E-04	1.6E-04	100%	1.4E-08	100%	8.8E-05
Total HI						0.001
Adult - Upper Exposure						
PFOS + PFHxS	1.2E-03	2.0E-05	100%	5.4E-07	93%	2.9E-02
PFOA	5.0E-04	1.6E-04	100%	2.3E-07	100%	1.4E-03
Total HI						0.0
Child - Typical Exposure						
PFOS + PFHxS	9.0E-04	2.0E-05	100%	4.8E-08	93%	2.6E-03
PFOA	5.0E-04	1.6E-04	100%	2.7E-08	100%	1.7E-04
Total HI						0.00
Child - Upper Exposure						
PFOS + PFHxS	1.2E-03	2.0E-05	100%	8.4E-07	93%	4.5E-02
PFOA	5.0E-04	1.6E-04	100%	3.5E-07	100%	2.2E-03
Total HI						0.0



Estimation of Hazard Index

RAAF Base Darwin

PFAS HHRA

Receptor:	Off-Base	Recreational User
Pathway:	Ingestion of Aquatic Biota	
Source:	AB12	Darwin Harbour Molluscs
Scenario ID:	42	AB12FK(ing)

Parameters	Units	Typical Exposure		Upper Estimate Exposure	
		Child	Adult	Child	Adult
Exposure Duration (ED)	years	6	10	6	35
Exposure Frequency (EF)	days/year	365	365	365	365
Averaging Time (AT)	years	6	10	6	35
Body Weight (BW)	kg	15	75	15	70
Biota Ingestion Rate (IR)	g/day	10	9	40	30
Contaminated fraction of food group ingested (FI)	%	10%	10%	50%	50%

Contaminant	Biota Concentration mg/kg	Oral Toxicity Criteria TDI (mg/kg-day)	Bioavailability (Bo)	Estimated Intake Dose CDI (mg/kg-day)	% TDI Allocated to Contaminated Sites	Estimated HQ
Adult - Typical Exposure						
PFOS + PFHxS	2.0E-03	2.0E-05	100%	2.4E-08	93%	1.3E-03
PFOA	3.0E-03	1.6E-04	100%	3.6E-08	100%	2.3E-04
Total HI						0.002
Adult - Upper Exposure						
PFOS + PFHxS	5.0E-03	2.0E-05	100%	1.1E-06	93%	5.8E-02
PFOA	4.0E-03	1.6E-04	100%	8.6E-07	100%	5.4E-03
Total HI						0.06
Child - Typical Exposure						
PFOS + PFHxS	2.0E-03	2.0E-05	100%	1.3E-07	93%	7.2E-03
PFOA	3.0E-03	1.6E-04	100%	2.0E-07	100%	1.3E-03
Total HI						0.01
Child - Upper Exposure						
PFOS + PFHxS	5.0E-03	2.0E-05	100%	6.7E-06	93%	3.6E-01
PFOA	4.0E-03	1.6E-04	100%	5.3E-06	100%	3.3E-02
Total HI						0.4