Appendix IR1-04-A Attachment 5 of the Action Item Response Memo, dated November 29, 2017

Red Mountain Underground Gold Project
IDM Mining Ltd. Responses to
Canadian Environmental Assessment Information Request #1

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MEMORANDUM

Core6 Environmental Ltd.
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Canada

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To: Max Brownhill November 29, 2017
From: Marc Cameron, Core6 Environmental

Re: IDM to update COPC screening based on the 'toddler' threshold value - Action Item 12

The COPC screening for country foods was updated to reflect the results of using adult and toddler based screening levels. Country foods screening levels were derived using an approach developed for deriving action levels for fish advisories (OHA 2016). Separate country foods screening levels were derived for fish and plants, given the differences in consumption rates for these two food sources. The following equation was used for determining tissue screening levels for non-carcinogenic toxicological endpoints for humans:

$$SL = 0.2 \times \frac{(TDI \times BW)}{FC}$$

Where:

SL = Screening Level (mg/kg)
TDI = Tolerable Daily Intake (mg/kg-day) (chemical-specific)
BW = Body Weight (kg) = 70.7kg for adults and = 16.5kg for toddlers
FC_F = Fish Consumption Rate (kg/day) =0.29 kg/day for adults and =0.091 kg/day for toddlers
FC_P = Plant Consumption Rate (kg/day) = 0.147 kg/day for adults and = 0.072 kg/day for toddlers

The following equation was used for determining country foods screening levels for carcinogenic effects:

$$SL = \frac{\left(\frac{ARL}{CSF} \times BW\right)}{FC}$$

Where:

SL = Screening Level (mg/kg)
ARL = Acceptable Risk Level (unit less) = $1x10^{-5}$
CSF = Cancer Slope Factor $(mg/kg\text{-}day)^{-1}$
BW, FC_F, FC_P were same as above

The screening levels are presented in Table 1 and Table 2, below. The derived screening levels were used to screen fish tissue and plant tissue data. This updated screening resulted in the identification of three COPCs that were not considered in the HHRA: boron, strontium and uranium. COPCs screened into the HHRA as a result of exceeding a screening level in one medium, were evaluated in all media. The HHRA calculations for surface water, soil, and country foods were updated to include: boron, strontium, and uranium. There was no change in the overall HHRA conclusion as a result of this screening update. Attachment F, Attachment G, and Attachment H (per the Application/EIS Appendix 22-A, HHRA) reflect how this analysis would affect the overall HHRA results.

Table 1: Country Food Screening Levels

Chemicals	Toxicity Reference Value (TRV)		Screening Level (Wild Game and Fish)				Screening Level (Plants)				Source of TRV
	Total Daily Intake (TDI) (mg/kg-d)	Slope Factor (SF) (mg/kg-d)-1	Non-carcinogenic (Adult) (mg/kg)	Non-carcinogenic (Toddler) (mg/kg)	Carcinogenic (Adult) (mg/kg)	Carcinogenic (Toddler) (mg/kg)	Non-carcinogenic (Adult) (mg/kg)	Non-carcinogenic (Toddler) (mg/kg)	Carcinogenic (Adult) (mg/kg)	Carcinogenic (Toddler) (mg/kg)	
Aluminum	1	NA	48.76	36.26	NA	NA	96.19	45.83	NA	NA	PPRTV
Antimony	0.0004	NA	0.020	0.015	NA	NA	0.038	0.02	NA	NA	IRIS
Arsenic	0.001	1.8	0.049	0.036	0.00135	0.00101	0.10	0.05	0.00267	0.00127	TDI - RIVM; SF - Health Canada
Barium	0.2	NA	9.75	7.25	NA	NA	19.24	9.17	NA	NA	IRIS
Beryllium	0.002	NA	0.10	0.07	NA	NA	0.19	0.09	NA	NA	IRIS
Bismuth	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
Boron	0.2	NA	9.75	7.25	NA	NA	19.24	9.17	NA	NA	IRIS
Cadmium	0.001	NA	0.049	0.036	NA	NA	0.10	0.05	NA	NA	Health Canada
Chromium	0.003	NA	0.15	0.11	NA	NA	0.29	0.14	NA	NA	Health Canada
Cobalt	0.0014	NA	0.068	0.051	NA	NA	0.135	0.06	NA	NA	PPRTV
Copper	0.141	NA	6.87	5.11	NA	NA	13.56	6.46	NA	NA	Health Canada
Iron	0.7	NA	34.13	25.38	NA	NA	67.33	32.08	NA	NA	PPRTV
Lead	0.0036	NA	0.18	0.13	NA	NA	0.35	0.17	NA	NA	RIVM
Manganese	0.156	NA	7.61	5.66	NA	NA	15.01	7.15	NA	NA	Health Canada
Mercury	0.0003	NA	0.015	0.011	NA	NA	0.029	0.01	NA	NA	Health Canada
Molybdenum	0.028	NA	1.37	1.02	NA	NA	2.69	1.28	NA	NA	Health Canada
Nickel	0.02	NA	0.98	0.73	NA	NA	1.92	0.92	NA	NA	Health Canada
Selenium	0.005	NA	0.24	0.18	NA	NA	0.48	0.23	NA	NA	IRIS
Silver	0.005	NA	0.24	0.18	NA	NA	0.48	0.23	NA	NA	IRIS
Strontium	0.6	NA	29.26	21.76	NA	NA	57.71	27.50	NA	NA	IRIS
Thallium	0.00001	NA	0.00049	0.00036	NA	NA	0.0010	0.00	NA	NA	IRIS
Tin	0.6	NA	29.26	21.76	NA	NA	57.71	27.50	NA	NA	HEAST
Titanium	3	NA	146.28	108.79	NA	NA	288.57	137.50	NA	NA	NSF
Uranium	0.0006	NA	0.029	0.022	NA	NA	0.058	0.03	NA	NA	Health Canada
Vanadium	0.005	NA	0.24	0.18	NA	NA	0.48	0.23	NA	NA	RSL
Zinc	0.5	NA	24.38	18.13	NA	NA	48.10	22.92	NA	NA	Health Canada

Table 2: Identification of COPCs in Country Foods

Constituent	Country Foods - Fish Screening Level (mg/kg)	Country Foods - Plant Screening Level (mg/kg)	Maximum Measured Fish Concentration (mg/kg)	Maximum Measured Plant Concentration (mg/kg)	COPC
Aluminum	36.26	45.83	56.90	54.53	Yes
Antimony	0.015	0.018	0.127	0.029	Yes
Arsenic	0.00101	0.00127	10.30	0.38	Yes
Barium	7.25	9.17	2.86	29.49	Yes
Beryllium	0.07	0.09	0.0020	0.00256	No
Bismuth	NA	NA	0.020	0.0037	No
Boron	7.25	9.17	0.10	17.32	Yes
Cadmium	0.036	0.046	1.03	2.65	Yes
Calcium	NA	NA	10300	8893.80	No
Chromium	0.11	0.14	0.10	0.25	Yes
Cobalt	0.051	0.064	0.51	0.48	Yes
Copper	5.11	6.46	2.47	5.46	No
Iron	25.38	32.08	314.00	139.45	Yes
Lead	0.13	0.17	1.02	0.138	Yes
Manganese	5.66	7.15	7.63	235.97	Yes
Mercury	0.011	0.014	0.0110	0.0054	No
Molybdenum	1.02	1.28	0.600	0.16	No
Nickel	0.73	0.92	0.59	4.87	Yes
Phosphorus	NA	NA	7400.00	1395.90	No
Selenium	0.18	0.23	3.44	1.28	Yes
Silver	0.18	0.23	0.040	0.0073	No
Sodium	NA	NA	1060.00	14.27	No
Strontium	21.76	27.50	9.43	38.53	Yes
Thallium	0.00036	0.00046	0.030	0.00074	Yes
Tin	21.76	27.50	0.070	0.0110	No
Titanium	108.79	137.50	2.11	1.70	No
Uranium	0.022	0.028	0.0290	0.00146	No
Vanadium	0.18	0.23	0.26	0.168	Yes
Zinc	18.13	22.92	40.50	129.93	Yes

Attachment F
Detailed Risk Estimates for Soil, Air, and Surface Water

Table F1: Constituent Concentrations Used in the HHRA

Constituent	Soil Baseline mg/kg	Soil Predicted mg/kg	Surface Water Baseline mg/L	Predicted Surface Water mg/L	Air Baseline (PMTotal) mg/m3	Predicted Air (PMTotal) mg/m3
Aluminum *c*	2.92E+04	2.94E+04	5.89E+00	6.15E+00	2.92E-04	4.54E-04
Antimony	7.40E+00	7.47E+00	2.05E-03	5.74E-03	7.40E-08	1.67E-07
Arsenic *d*	7.29E+01	7.37E+01	8.45E-03	9.79E-03	7.29E-07	1.69E-06
Barium	4.69E+02	4.72E+02	1.13E-01	1.19E-01	4.69E-06	7.26E-06
Bismuth	3.19E-01	3.28E-01	8.36E-03	8.44E-03	3.19E-09	1.90E-08
Boron	2.00E+01	2.03E+01	9.19E-02	9.57E-02	3.40E-08	2.49E-07
Cadmium	1.35E+00	1.37E+00	4.83E-04	1.33E-03	1.35E-08	4.15E-08
Chromium	1.09E+02	1.09E+02	6.68E-03	7.62E-03	1.09E-06	1.68E-06
Cobalt	2.30E+01	2.32E+01	5.03E-03	6.44E-03	2.30E-07	3.53E-07
Iron	5.71E+04	5.74E+04	9.17E+00	9.66E+00	5.71E-04	8.82E-04
Lead	4.27E+01	4.30E+01	6.83E-03	7.78E-03	4.27E-07	7.20E-07
Manganese *e*	9.19E+02	9.26E+02	2.94E-01	5.38E-01	9.19E-06	1.49E-05
Mercury, inorganic (ionic)	9.20E-02	1.46E-01	1.21E-05	6.91E-05	9.20E-10	1.18E-07
Molybdenum	3.23E+01	3.25E+01	5.84E-03	6.66E-03	3.23E-07	4.80E-07
Nickel	5.53E+01	5.57E+01	2.06E-02	2.72E-02	5.53E-07	8.53E-07
Selenium *e*	4.70E+00	4.74E+00	2.30E-03	3.26E-03	4.70E-08	8.40E-08
Strontium	9.56E+01	9.61E+01	2.69E-01	2.96E-01	3.25E-07	2.30E-06
Tellurium	7.01E-01	7.16E-01	NA	NA	7.01E-09	3.25E-08
Thallium	3.20E-01	3.23E-01	1.84E-04	1.92E-04	3.20E-09	6.50E-09
Titanium	2.25E+03	2.26E+03	9.82E-02	1.01E-01	2.25E-05	3.31E-05
Uranium	1.17E+00	1.19E+00	5.00E-04	5.00E-04	3.99E-09	3.06E-08
Vanadium	1.11E+02	1.12E+02	1.35E-02	1.37E-02	1.11E-06	1.77E-06
Zinc *e*	2.37E+02	2.39E+02	5.81E-02	1.13E-01	2.37E-06	5.09E-06

Table F2. Calculation of Non-Carcinogenic Hazard from Direct Contact with Soil and Inhalation of Air Particulate by the Hunter/Trapper/Fisher – Baseline

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Summer Resident - Incidental Soil Ingestion								
Aluminum	2.94E+04	1.0E+00	N/A	3.6E-02	7.1E-02	8.9E-03	4.9E-03	4.2E-03
Antimony	7.47E+00	4.0E-04	N/A	2.3E-02	4.5E-02	5.7E-03	3.1E-03	2.6E-03
Arsenic	7.37E+01	1.0E-03	N/A	9.0E-02	1.8E-01	2.2E-02	1.2E-02	1.0E-02
Barium	4.72E+02	2.0E-01	N/A	2.9E-03	5.7E-03	7.2E-04	4.0E-04	3.3E-04
Bismuth	3.28E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	2.03E+01	2.0E-01	N/A	1.2E-04	2.5E-04	3.1E-05	1.7E-05	1.4E-05
Cadmium	1.37E+00	1.0E-03	N/A	1.7E-03	3.3E-03	4.2E-04	2.3E-04	1.9E-04
Chromium	1.09E+02	3.0E-03	N/A	4.4E-02	8.8E-02	1.1E-02	6.1E-03	5.2E-03
Cobalt	2.32E+01	1.4E-03	N/A	2.0E-02	4.0E-02	5.0E-03	2.8E-03	2.3E-03
Iron	5.74E+04	7.0E-01	N/A	1.0E-01	2.0E-01	2.5E-02	1.4E-02	1.2E-02
Lead	4.30E+01	3.6E-03	N/A	1.5E-02	2.9E-02	3.6E-03	2.0E-03	1.7E-03
Manganese	9.26E+02	0.156	N/A	7.2E-03	1.4E-02	1.8E-03	9.9E-04	8.4E-04
Mercury	1.46E-01	3.0E-04	N/A	5.9E-04	1.2E-03	1.5E-04	8.1E-05	6.9E-05
Nickel	5.57E+01	1.10E-02	N/A	6.2E-03	1.2E-02	1.5E-03	8.5E-04	7.2E-04
Selenium	4.74E+00	3.0E-04	N/A	1.9E-02	3.8E-02	4.8E-03	2.6E-03	2.2E-03
Strontium	9.61E+01	0.6	N/A	2.0E-04	3.9E-04	4.9E-05	2.7E-05	2.3E-05
Tellurium	7.16E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	3.23E-01	7.0E-05	N/A	5.6E-03	1.1E-02	1.4E-03	7.7E-04	6.5E-04
Titanium	2.26E+03	3.0E+00	N/A	9.2E-04	1.8E-03	2.3E-04	1.3E-04	1.1E-04
Uranium	1.19E+00	6.0E-04	N/A	2.4E-03	4.8E-03	6.0E-04	3.3E-04	2.8E-04
Vanadium	1.12E+02	5.0E-03	N/A	2.7E-02	5.4E-02	6.8E-03	3.8E-03	3.2E-03
Zinc	2.39E+02	5.0E-01	N/A	5.8E-04	1.2E-03	1.5E-04	8.0E-05	6.8E-05

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Summer Resident - Dermal Contact with Soil								
Aluminum	2.94E+04	1.0E+00	1.0E-02	8.4E-04	5.3E-04	4.7E-04	3.7E-04	3.6E-04
Antimony	7.47E+00	4.0E-04	1.0E-02	5.3E-04	3.4E-04	3.0E-04	2.4E-04	2.3E-04
Arsenic	7.37E+01	1.0E-03	3.0E-02	6.3E-03	4.0E-03	3.5E-03	2.8E-03	2.7E-03
Barium	4.72E+02	2.0E-01	1.0E-01	6.7E-04	4.3E-04	3.7E-04	3.0E-04	2.9E-04
Bismuth	3.28E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	2.03E+01	2.0E-01	1.0E-02	2.9E-06	1.8E-06	1.6E-06	1.3E-06	1.2E-06
Cadmium	1.37E+00	1.0E-03	1.0E-02	3.9E-05	2.5E-05	2.2E-05	1.7E-05	1.7E-05
Chromium	1.09E+02	3.0E-03	1.0E-02	1.0E-03	6.6E-04	5.8E-04	4.6E-04	4.4E-04
Cobalt	2.32E+01	1.4E-03	1.0E-02	4.7E-04	3.0E-04	2.6E-04	2.1E-04	2.0E-04
Iron	5.74E+04	7.0E-01	1.0E-02	2.3E-03	1.5E-03	1.3E-03	1.0E-03	9.9E-04
Lead	4.30E+01	3.6E-03	1.0E-02	3.4E-04	2.2E-04	1.9E-04	1.5E-04	1.4E-04
Manganese	9.26E+02	0.156	1.0E-02	1.7E-04	1.1E-04	9.4E-05	7.6E-05	7.2E-05
Mercury	1.46E-01	3.0E-04	1.0E+00	1.4E-03	8.8E-04	7.7E-04	6.2E-04	5.9E-04
Nickel	5.57E+01	1.10E-02	9.0E-02	1.3E-03	8.3E-04	7.2E-04	5.8E-04	5.5E-04
Selenium	4.74E+00	3.0E-04	1.0E-02	4.5E-04	2.9E-04	2.5E-04	2.0E-04	1.9E-04
Strontium	9.61E+01	0.6	1.0E-02	4.6E-06	2.9E-06	2.5E-06	2.0E-06	1.9E-06
Tellurium	7.16E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	3.23E-01	7.0E-05	1.0E-02	1.3E-04	8.4E-05	7.3E-05	5.9E-05	5.6E-05
Titanium	2.26E+03	3.0E+00	1.0E-02	2.1E-05	1.4E-05	1.2E-05	9.6E-06	9.1E-06
Uranium	1.19E+00	6.0E-04	1.0E-02	5.6E-05	3.6E-05	3.1E-05	2.5E-05	2.4E-05
Vanadium	1.12E+02	5.0E-03	1.0E-02	6.4E-04	4.1E-04	3.6E-04	2.9E-04	2.7E-04
Zinc	2.39E+02	5.0E-01	1.0E-01	1.4E-04	8.7E-05	7.6E-05	6.1E-05	5.8E-05

Constituent	Air Concentration (mg/kg)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Summer Resident – Inhalation of Particulate								
Aluminum	4.54E-04	5.0E-03	N/A	1.2E-08	2.3E-08	2.0E-08	1.2E-08	1.1E-08
Antimony	1.67E-07	1.4E-03	N/A	1.5E-11	3.0E-11	2.6E-11	1.6E-11	1.4E-11
Arsenic	1.69E-06	1.0E-03	N/A	2.2E-10	4.3E-10	3.7E-10	2.2E-10	2.0E-10
Barium	7.26E-06	2.0E-01	N/A	4.6E-12	9.1E-12	8.0E-12	4.7E-12	4.3E-12
Bismuth	1.90E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	2.49E-07	7.0E-01	N/A	4.6E-14	8.9E-14	7.8E-14	4.6E-14	4.2E-14
Cadmium	4.15E-08	3.5E-03	N/A	1.5E-12	3.0E-12	2.6E-12	1.6E-12	1.4E-12
Chromium	1.68E-06	6.0E-02	N/A	3.6E-12	7.0E-12	6.2E-12	3.7E-12	3.3E-12
Cobalt	3.53E-07	4.9E-03	N/A	9.2E-12	1.8E-11	1.6E-11	9.4E-12	8.5E-12
Iron	8.82E-04	2.5E+00	N/A	4.6E-11	9.1E-11	7.9E-11	4.7E-11	4.2E-11
Lead	7.20E-07	1.3E-02	N/A	7.3E-12	1.4E-11	1.3E-11	7.5E-12	6.7E-12
Manganese	1.49E-05	0.546	N/A	3.5E-12	6.9E-12	6.0E-12	3.6E-12	3.2E-12
Mercury	1.18E-07	1.1E-03	N/A	1.4E-11	2.8E-11	2.5E-11	1.5E-11	1.3E-11
Nickel	8.53E-07	3.00E-02	N/A	3.6E-12	7.2E-12	6.3E-12	3.7E-12	3.3E-12
Selenium	8.40E-08	3.0E-02	N/A	3.6E-13	7.0E-13	6.2E-13	3.7E-13	3.3E-13
Strontium	2.30E-06	2.1E+00	N/A	1.4E-13	2.8E-13	2.4E-13	1.4E-13	1.3E-13
Tellurium	3.25E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	6.50E-09	3.5E-05	N/A	2.4E-11	4.7E-11	4.1E-11	2.4E-11	2.2E-11
Titanium	3.31E-05	2.1E+00	N/A	2.0E-12	4.0E-12	3.5E-12	2.1E-12	1.9E-12
Uranium	3.06E-08	8.0E-04	N/A	4.9E-12	9.6E-12	8.4E-12	5.0E-12	4.5E-12
Vanadium	1.77E-06	8.0E-04	N/A	2.8E-10	5.6E-10	4.9E-10	2.9E-10	2.6E-10
Zinc	5.09E-06	7.0E-04	N/A	9.3E-10	1.8E-09	1.6E-09	9.5E-10	8.5E-10

Table F3. Calculation of Non-Carcinogenic Hazard from Direct Contact with Soil and Inhalation of Air Particulate by the Hunter/Trapper/Fisher – Predicted

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Hazard Quotient	
				Teen	Adult
Hunter/Trapper/Fisher - Incidental Soil Ingestion					
Aluminum	2.94E+04	1.0E+00	N/A	6.6E-03	5.6E-03
Antimony	7.47E+00	4.0E-04	N/A	4.2E-03	3.5E-03
Arsenic	7.37E+01	1.0E-03	N/A	1.6E-02	1.4E-02
Barium	4.72E+02	2.0E-01	N/A	5.3E-04	4.4E-04
Bismuth	3.28E-01	N/A	N/A	N/A	N/A
Boron	2.03E+01	2.0E-01	0.0919	2.3E-05	1.9E-05
Cadmium	1.37E+00	1.0E-03	N/A	3.1E-04	2.6E-04
Chromium	1.09E+02	1.0E-03	N/A	2.4E-02	2.1E-02
Cobalt	2.32E+01	1.4E-03	N/A	3.7E-03	3.1E-03
Iron	5.74E+04	7.0E-01	N/A	1.8E-02	1.5E-02
Lead	4.30E+01	3.6E-03	N/A	2.7E-03	2.3E-03
Manganese	9.26E+02	0.156	N/A	1.3E-03	1.1E-03
Mercury	1.46E-01	3.0E-04	N/A	1.1E-04	9.2E-05
Nickel	5.57E+01	1.10E-02	N/A	1.1E-03	9.5E-04
Selenium	4.74E+00	3.0E-04	N/A	3.5E-03	3.0E-03
Strontium	9.56E+01	0.6	2.69E-01	3.6E-05	3.0E-05
Tellurium	7.16E-01	N/A	N/A	N/A	N/A
Thallium	3.23E-01	7.0E-05	N/A	1.0E-03	8.7E-04
Titanium	2.26E+03	3.0E+00	N/A	1.7E-04	1.4E-04
Uranium	1.19E+00	6.0E-04	5.00E-04	4.4E-04	3.7E-04
Vanadium	1.12E+02	5.0E-03	N/A	5.0E-03	4.2E-03
Zinc	2.39E+02	5.0E-01	N/A	1.1E-04	9.0E-05

Hunter/Trapper/Fisher - Dermal Contact with Soil					
Aluminum	2.94E+04	1.0E+00	1.0E-02	5.0E-04	4.8E-04
Antimony	7.47E+00	4.0E-04	1.0E-02	3.2E-04	3.0E-04
Arsenic	7.37E+01	1.0E-03	3.0E-02	3.8E-03	3.6E-03
Barium	4.72E+02	2.0E-01	1.0E-01	4.0E-04	3.8E-04
Bismuth	3.28E-01	N/A	N/A	N/A	N/A
Boron	2.03E+01	0.2	1.0E-02	1.7E-06	1.6E-06
Cadmium	1.37E+00	1.0E-03	1.0E-02	2.3E-05	2.2E-05
Chromium	1.09E+02	1.0E-03	1.0E-02	1.9E-03	1.8E-03
Cobalt	2.32E+01	1.4E-03	1.0E-02	2.8E-04	2.7E-04
Iron	5.74E+04	7.0E-01	1.0E-02	1.4E-03	1.3E-03
Lead	4.30E+01	3.6E-03	1.0E-02	2.0E-04	1.9E-04
Manganese	9.26E+02	0.156	1.0E-02	1.0E-04	9.6E-05
Mercury	1.46E-01	3.0E-04	1.0E+00	8.3E-04	7.8E-04
Nickel	5.57E+01	1.10E-02	9.0E-02	7.7E-04	7.4E-04
Selenium	4.74E+00	3.0E-04	1.0E-02	2.7E-04	2.5E-04
Strontium	9.56E+00	6.0E-01	1.0E-02	2.7E-07	2.6E-07
Tellurium	7.16E-01	N/A	N/A	N/A	N/A
Thallium	3.23E-01	7.0E-05	1.0E-02	7.8E-05	7.4E-05
Titanium	2.26E+03	3.0E+00	1.0E-02	1.3E-05	1.2E-05
Uranium	1.19E+00	6.0E-04	1.0E-02	3.4E-05	3.2E-05
Vanadium	1.12E+02	5.0E-03	1.0E-02	3.8E-04	3.6E-04
Zinc	2.39E+02	5.0E-01	1.0E-01	8.1E-05	7.7E-05
Hunter/Trapper/Fisher - Inhalation of Particulate					
	Air Concentration (mg/m^3)				
Aluminum	4.54E-04	5.0E-03	N/A	1.6E-08	1.4E-08
Antimony	1.67E-07	1.4E-03	N/A	2.1E-11	1.9E-11
Arsenic	1.69E-06	1.0E-03	N/A	2.9E-10	2.6E-10

Constituent	Air Concentration (mg/m3)	TRV	DAF	Hazard Quotient	
				Teen	Adult
Barium	7.26E-06	1.0E-03	N/A	1.3E-09	1.1E-09
Bismuth	1.90E-08	N/A	N/A	N/A	N/A
Boron	2.49E-07	7.0E-01	N/A	6.2E-14	5.6E-14
Cadmium	4.15E-08	3.5E-03	N/A	2.1E-12	1.9E-12
Chromium	1.68E-06	6.0E-02	N/A	4.9E-12	4.4E-12
Cobalt	3.53E-07	4.9E-03	N/A	1.3E-11	1.1E-11
Iron	8.82E-04	2.5E+00	N/A	6.3E-11	5.6E-11
Lead	7.20E-07	1.3E-02	N/A	1.0E-11	8.9E-12
Manganese	1.49E-05	0.546	N/A	4.8E-12	4.3E-12
Mercury	1.18E-07	1.1E-03	N/A	2.0E-11	1.8E-11
Nickel	8.53E-07	3.00E-02	N/A	5.0E-12	4.5E-12
Selenium	8.40E-08	3.0E-02	N/A	4.9E-13	4.4E-13
Strontium	2.30E-06	2.1E+00	N/A	1.9E-13	1.7E-13
Tellurium	3.25E-08	N/A	N/A	N/A	N/A
Thallium	6.50E-09	3.5E-05	N/A	3.2E-11	2.9E-11
Titanium	3.31E-05	2.1E+00	N/A	2.7E-12	2.5E-12
Uranium	3.06E-08	8.0E-04	N/A	6.7E-12	6.0E-12
Vanadium	1.77E-06	8.0E-04	N/A	3.8E-10	3.5E-10
Zinc	5.09E-06	7.0E-04	N/A	1.3E-09	1.1E-09

Table F4. Calculation of Carcinogenic Risk from Direct Contact with Soil and Inhalation of Air Particulate by the Hunter/Trapper/Fisher – Baseline

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Cancer Risk	
				Teen	Adult
Hunter/Trapper/Fisher - Incidental Soil Ingestion					
Arsenic	7.29E+01	1.8E+00	N/A	8.8E-07	5.7E-06
Hunter/Trapper/Fisher - Dermal Contact with Soil					
Arsenic	7.29E+01	1.8E+00	0.03	2.0E-07	1.5E-06
Hunter/Trapper/Fisher - Inhalation of Particulate					
	Air Concentration (mg/m^3)				
Arsenic	7.29E-07	2.7E+01	N/A	1.0E-07	7.1E-07
Cadmium	1.35E-08	4.2E+01	N/A	3.0E-09	2.0E-08
Chromium	1.09E-06	4.6E+01	N/A	2.6E-07	1.8E-06
Nickel	5.53E-07	7.1E-01	N/A	2.1E-09	1.4E-08

Table F5 Calculation of Carcinogenic Risk from Direct Contact with Soil and Inhalation of Air Particulate by the Hunter/Trapper/Fisher – Predicted

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Cancer Risk	
				Teen	Adult
Hunter/Trapper/Fisher - Incidental Soil Ingestion					
Arsenic	7.37E+01	1.8E+00	N/A	8.8E-07	5.7E-06
Hunter/Trapper/Fisher - Dermal Contact with Soil					
Arsenic	7.37E+01	1.8E+00	3.0E-02	2.0E-07	1.5E-06
Hunter/Trapper/Fisher - Inhalation of Particulate					
	Air Concentration (mg/m^3)				
Arsenic	1.69E-06	2.7E+01	N/A	2.4E-07	1.7E-06
Cadmium	4.15E-08	4.2E+01	N/A	9.1E-09	6.3E-08
Chromium	1.68E-06	4.6E+01	N/A	4.0E-07	2.8E-06
Nickel	8.53E-07	7.1E-01	N/A	3.2E-09	2.2E-08

Table F6. Calculation of Non-Carcinogenic Hazard from Direct Contact with Soil and Inhalation of Air Particulate by the Recreational User – Baseline

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Recreational User - Incidental Soil Ingestion								
Aluminum	2.92E+04	1.0E+00	N/A	1.8E-02	3.5E-02	4.4E-03	2.4E-03	2.1E-03
Antimony	7.40E+00	4.0E-04	N/A	1.1E-02	2.2E-02	2.8E-03	1.5E-03	1.3E-03
Arsenic	7.29E+01	1.0E-03	N/A	4.4E-02	8.8E-02	1.1E-02	6.1E-03	5.2E-03
Barium	4.69E+02	2.0E-01	N/A	1.4E-03	2.8E-03	3.6E-04	2.0E-04	1.7E-04
Bismuth	3.19E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	2.00E+01	2.0E-01	0.0919	6.1E-05	1.2E-04	1.5E-05	8.4E-06	7.1E-06
Cadmium	1.35E+00	1.0E-03	N/A	8.2E-04	1.6E-03	2.0E-04	1.1E-04	9.5E-05
Chromium	1.09E+02	3.0E-03	N/A	2.2E-02	4.4E-02	5.5E-03	3.0E-03	2.6E-03
Cobalt	2.30E+01	1.4E-03	N/A	1.0E-02	2.0E-02	2.5E-03	1.4E-03	1.2E-03
Iron	5.71E+04	7.0E-01	N/A	5.0E-02	9.9E-02	1.2E-02	6.8E-03	5.8E-03
Lead	4.27E+01	3.6E-03	N/A	7.2E-03	1.4E-02	1.8E-03	9.9E-04	8.4E-04
Manganese	9.19E+02	0.156	N/A	3.6E-03	7.1E-03	9.0E-04	4.9E-04	4.2E-04
Mercury	9.20E-02	3.0E-04	N/A	1.9E-04	3.7E-04	4.7E-05	2.6E-05	2.2E-05
Nickel	5.53E+01	1.10E-02	N/A	3.1E-03	6.1E-03	7.6E-04	4.2E-04	3.6E-04
Selenium	4.70E+00	3.0E-04	N/A	9.6E-03	1.9E-02	2.4E-03	1.3E-03	1.1E-03
Strontium	9.56E+01	0.6	2.69E-01	9.7E-05	1.9E-04	2.4E-05	1.3E-05	1.1E-05
Tellurium	7.01E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	3.20E-01	7.0E-05	N/A	2.8E-03	5.5E-03	6.9E-04	3.8E-04	3.2E-04
Titanium	2.25E+03	3.0E+00	N/A	4.6E-04	9.1E-04	1.1E-04	6.3E-05	5.3E-05
Uranium	1.17E+00	6.0E-04	5.00E-04	1.2E-03	2.4E-03	3.0E-04	1.6E-04	1.4E-04
Vanadium	2.37E+02	5.0E-03	N/A	2.9E-02	5.8E-02	7.2E-03	4.0E-03	3.4E-03

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Zinc	2.37E+02	5.0E-01	N/A	2.9E-04	5.8E-04	7.2E-05	4.0E-05	3.4E-05
Recreational User - Dermal Contact with Soil								
Aluminum	2.92E+04	1.0E+00	1.0E-02	4.2E-04	3.0E-04	2.3E-04	1.9E-04	1.8E-04
Antimony	7.40E+00	4.0E-04	1.0E-02	2.6E-04	1.9E-04	1.5E-04	1.2E-04	1.1E-04
Arsenic	7.29E+01	1.0E-03	3.0E-02	3.1E-03	2.3E-03	1.7E-03	1.4E-03	1.3E-03
Barium	4.69E+02	2.0E-01	1.0E-01	3.3E-04	2.4E-04	1.9E-04	1.5E-04	1.4E-04
Bismuth	3.19E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	1.00E+01	0.2	1.0E-02	7.1E-07	5.2E-07	4.0E-07	3.2E-07	3.0E-07
Cadmium	1.35E+00	1.0E-03	1.0E-02	1.9E-05	1.4E-05	1.1E-05	8.6E-06	8.2E-06
Chromium	1.09E+02	1.0E-03	1.0E-02	1.5E-03	1.1E-03	8.6E-04	6.9E-04	6.6E-04
Cobalt	2.30E+01	1.4E-03	1.0E-02	2.3E-04	1.7E-04	1.3E-04	1.0E-04	1.0E-04
Iron	5.71E+04	7.0E-01	1.0E-02	1.2E-03	8.5E-04	6.5E-04	5.2E-04	4.9E-04
Lead	4.27E+01	3.6E-03	1.0E-02	1.7E-04	1.2E-04	9.4E-05	7.5E-05	7.2E-05
Manganese	9.19E+02	0.156	1.0E-02	8.4E-05	6.1E-05	4.7E-05	3.8E-05	3.6E-05
Mercury	9.20E-02	3.0E-04	1.0E+00	4.4E-04	3.2E-04	2.4E-04	2.0E-04	1.9E-04
Nickel	5.53E+01	1.10E-02	9.0E-02	6.4E-04	4.7E-04	3.6E-04	2.9E-04	2.7E-04
Selenium	4.70E+00	3.0E-04	1.0E-02	2.2E-04	1.6E-04	1.2E-04	1.0E-04	9.5E-05
Strontium	9.56E+00	6.0E-01	1.0E-02	2.3E-07	1.7E-07	1.3E-07	1.0E-07	9.6E-08
Tellurium	7.01E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	3.20E-01	7.0E-05	1.0E-02	6.5E-05	4.8E-05	3.6E-05	2.9E-05	2.8E-05
Titanium	2.25E+03	3.0E+00	1.0E-02	1.1E-05	7.8E-06	5.9E-06	4.8E-06	4.5E-06
Uranium	1.17E+00	6.0E-04	1.0E-02	2.8E-05	2.0E-05	1.5E-05	1.2E-05	1.2E-05
Vanadium	1.11E+02	5.0E-03	1.0E-02	3.2E-04	2.3E-04	1.8E-04	1.4E-04	1.3E-04
Zinc	2.37E+02	5.0E-01	1.0E-01	6.7E-05	4.9E-05	3.8E-05	3.0E-05	2.9E-05

Recreational User - Inhalation of Particulate								
Constituent	Air Concentration (mg/m^3)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Aluminum	2.92E-04	5.0E-03	N/A	3.7E-09	7.4E-09	6.4E-09	3.8E-09	3.4E-09
Antimony	7.40E-08	1.4E-03	N/A	3.4E-12	6.6E-12	5.8E-12	3.5E-12	3.1E-12
Arsenic	7.29E-07	1.0E-03	N/A	4.7E-11	9.2E-11	8.0E-11	4.8E-11	4.3E-11
Barium	4.69E-06	2.0E-01	N/A	1.5E-12	2.9E-12	2.6E-12	1.5E-12	1.4E-12
Bismuth	3.19E-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	3.40E-08	7.0E-01	N/A	3.1E-15	6.1E-15	5.4E-15	3.2E-15	2.9E-15
Cadmium	1.35E-08	3.5E-03	N/A	2.5E-13	4.8E-13	4.2E-13	2.5E-13	2.3E-13
Chromium	1.09E-06	6.0E-02	N/A	1.2E-12	2.3E-12	2.0E-12	1.2E-12	1.1E-12
Cobalt	2.30E-07	4.9E-03	N/A	3.0E-12	5.9E-12	5.2E-12	3.1E-12	2.8E-12
Iron	5.71E-04	2.5E+00	N/A	1.5E-11	2.9E-11	2.6E-11	1.5E-11	1.4E-11
Lead	4.27E-07	1.3E-02	N/A	2.2E-12	4.3E-12	3.7E-12	2.2E-12	2.0E-12
Manganese	9.19E-06	0.546	N/A	1.1E-12	2.1E-12	1.9E-12	1.1E-12	9.9E-13
Mercury	9.20E-10	1.1E-03	N/A	5.6E-14	1.1E-13	9.7E-14	5.7E-14	5.1E-14
Nickel	5.53E-07	3.00E-02	N/A	1.2E-12	2.3E-12	2.0E-12	1.2E-12	1.1E-12
Selenium	4.70E-08	3.0E-02	N/A	1.0E-13	2.0E-13	1.7E-13	1.0E-13	9.2E-14
Strontium	3.25E-07	2.1E+00	N/A	9.9E-15	1.9E-14	1.7E-14	1.0E-14	9.1E-15
Tellurium	7.01E-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	3.20E-09	3.5E-05	N/A	5.9E-12	1.1E-11	1.0E-11	6.0E-12	5.4E-12
Titanium	2.25E-05	2.1E+00	N/A	6.9E-13	1.3E-12	1.2E-12	7.0E-13	6.3E-13
Uranium	3.99E-09	8.0E-04	N/A	3.2E-13	6.3E-13	5.5E-13	3.3E-13	2.9E-13
Vanadium	1.11E-06	8.0E-04	N/A	8.9E-11	1.8E-10	1.5E-10	9.1E-11	8.2E-11
Zinc	2.37E-06	7.0E-04	N/A	2.2E-10	4.3E-10	3.7E-10	2.2E-10	2.0E-10

Table F7. Calculation of Non-Carcinogenic Hazard from Direct Contact with Soil and Inhalation of Air Particulate by the Recreational User – Predicted

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Recreational User - Incidental Soil Ingestion								
Aluminum	2.94E+04	1.0E+00	N/A	1.8E-02	3.6E-02	4.5E-03	2.5E-03	2.1E-03
Antimony	7.47E+00	4.0E-04	N/A	1.1E-02	2.3E-02	2.8E-03	1.6E-03	1.3E-03
Arsenic	7.37E+01	1.0E-03	N/A	4.5E-02	8.9E-02	1.1E-02	6.2E-03	5.2E-03
Barium	4.72E+02	2.0E-01	N/A	1.4E-03	2.9E-03	3.6E-04	2.0E-04	1.7E-04
Bismuth	3.28E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	2.03E+01	2.0E-01	0.0919	6.2E-05	1.2E-04	1.5E-05	8.5E-06	7.2E-06
Cadmium	1.37E+00	1.0E-03	N/A	8.3E-04	1.7E-03	2.1E-04	1.1E-04	9.7E-05
Chromium	1.09E+02	3.0E-03	N/A	2.2E-02	4.4E-02	5.5E-03	3.1E-03	2.6E-03
Cobalt	2.32E+01	1.4E-03	N/A	1.0E-02	2.0E-02	2.5E-03	1.4E-03	1.2E-03
Iron	5.74E+04	7.0E-01	N/A	5.0E-02	9.9E-02	1.2E-02	6.9E-03	5.8E-03
Lead	4.30E+01	3.6E-03	N/A	7.3E-03	1.4E-02	1.8E-03	1.0E-03	8.4E-04
Manganese	9.26E+02	0.156	N/A	3.6E-03	7.2E-03	9.0E-04	5.0E-04	4.2E-04
Mercury	1.46E-01	3.0E-04	N/A	3.0E-04	5.9E-04	7.4E-05	4.1E-05	3.4E-05
Nickel	5.57E+01	1.10E-02	N/A	3.1E-03	6.1E-03	7.7E-04	4.2E-04	3.6E-04
Selenium	4.74E+00	3.0E-04	N/A	9.6E-03	1.9E-02	2.4E-03	1.3E-03	1.1E-03
Strontium	9.61E+01	0.6	2.69E-01	9.8E-05	1.9E-04	2.4E-05	1.3E-05	1.1E-05
Tellurium	7.16E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	3.23E-01	7.0E-05	N/A	2.8E-03	5.6E-03	7.0E-04	3.9E-04	3.3E-04
Titanium	2.26E+03	3.0E+00	N/A	4.6E-04	9.1E-04	1.1E-04	6.3E-05	5.3E-05
Uranium	1.17E+00	6.0E-04	5.00E-04	1.2E-03	2.4E-03	3.0E-04	1.6E-04	1.4E-04

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Vanadium	2.39E+02	5.0E-03	N/A	2.9E-02	5.8E-02	7.3E-03	4.0E-03	3.4E-03
Zinc	2.39E+02	5.0E-01	N/A	2.9E-04	5.8E-04	7.3E-05	4.0E-05	3.4E-05
Recreational User - Dermal Contact with Soil								
Aluminum	2.94E+04	1.0E+00	1.0E-02	4.2E-04	3.1E-04	2.3E-04	1.9E-04	1.8E-04
Antimony	7.47E+00	4.0E-04	1.0E-02	2.7E-04	1.9E-04	1.5E-04	1.2E-04	1.1E-04
Arsenic	7.37E+01	1.0E-03	3.0E-02	3.1E-03	2.3E-03	1.8E-03	1.4E-03	1.3E-03
Barium	4.72E+02	2.0E-01	1.0E-01	3.4E-04	2.5E-04	1.9E-04	1.5E-04	1.4E-04
Bismuth	3.28E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	1.00E+01	0.2	1.0E-02	7.1E-07	5.2E-07	4.0E-07	3.2E-07	3.0E-07
Cadmium	1.37E+00	1.0E-03	1.0E-02	1.9E-05	1.4E-05	1.1E-05	8.7E-06	8.3E-06
Chromium	1.09E+02	1.0E-03	1.0E-02	1.6E-03	1.1E-03	8.7E-04	7.0E-04	6.6E-04
Cobalt	2.32E+01	1.4E-03	1.0E-02	2.4E-04	1.7E-04	1.3E-04	1.1E-04	1.0E-04
Iron	5.74E+04	7.0E-01	1.0E-02	1.2E-03	8.6E-04	6.5E-04	5.2E-04	5.0E-04
Lead	4.30E+01	3.6E-03	1.0E-02	1.7E-04	1.2E-04	9.5E-05	7.6E-05	7.2E-05
Manganese	9.26E+02	0.156	1.0E-02	8.4E-05	6.2E-05	4.7E-05	3.8E-05	3.6E-05
Molybdenum	3.25E+01	2.00E+03		0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
Nickel	5.57E+01	1.10E-02	9.0E-02	6.5E-04	4.7E-04	3.6E-04	2.9E-04	2.8E-04
Strontium	9.56E+00	6.0E-01	1.0E-02	2.3E-07	1.7E-07	1.3E-07	1.0E-07	9.6E-08
Tellurium	7.16E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	3.23E-01	7.0E-05	1.0E-02	6.6E-05	4.8E-05	3.7E-05	2.9E-05	2.8E-05
Titanium	2.26E+03	3.0E+00	1.0E-02	1.1E-05	7.9E-06	6.0E-06	4.8E-06	4.6E-06
Uranium	1.19E+00	6.0E-04	1.0E-02	2.8E-05	2.1E-05	1.6E-05	1.3E-05	1.2E-05
Vanadium	1.12E+02	5.0E-03	1.0E-02	3.2E-04	2.3E-04	1.8E-04	1.4E-04	1.4E-04
Zinc	2.39E+02	5.0E-01	1.0E-01	6.8E-05	5.0E-05	3.8E-05	3.0E-05	2.9E-05

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Recreational User - Inhalation of Particulate								
	Air Concentration (mg/m^3)							
Aluminum	4.54E-04	5.0E-03	N/A	5.8E-09	1.1E-08	1.0E-08	5.9E-09	5.3E-09
Antimony	1.67E-07	1.4E-03	N/A	7.7E-12	1.5E-11	1.3E-11	7.8E-12	7.0E-12
Arsenic	1.69E-06	1.0E-03	N/A	1.1E-10	2.1E-10	1.9E-10	1.1E-10	9.9E-11
Barium	7.26E-06	2.0E-01	N/A	2.3E-12	4.6E-12	4.0E-12	2.4E-12	2.1E-12
Bismuth	1.90E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	2.49E-07	7.0E-01	N/A	2.3E-14	4.5E-14	3.9E-14	2.3E-14	2.1E-14
Cadmium	4.15E-08	3.5E-03	N/A	7.6E-13	1.5E-12	1.3E-12	7.8E-13	7.0E-13
Chromium	1.68E-06	6.0E-02	N/A	1.8E-12	3.5E-12	3.1E-12	1.8E-12	1.6E-12
Cobalt	3.53E-07	4.9E-03	N/A	4.6E-12	9.1E-12	7.9E-12	4.7E-12	4.2E-12
Iron	8.82E-04	2.5E+00	N/A	2.3E-11	4.5E-11	4.0E-11	2.4E-11	2.1E-11
Lead	7.20E-07	1.3E-02	N/A	3.7E-12	7.2E-12	6.3E-12	3.7E-12	3.4E-12
Manganese	1.49E-05	0.546	N/A	1.7E-12	3.4E-12	3.0E-12	1.8E-12	1.6E-12
Molybdenum*	4.80E-07	7.00E+03	N/A	4.4E-18	8.6E-18	7.6E-18	4.5E-18	4.0E-18
Nickel	8.53E-07	3.00E-02	N/A	1.8E-12	3.6E-12	3.1E-12	1.9E-12	1.7E-12
Strontium	2.30E-06	2.1E+00	N/A	7.0E-14	1.4E-13	1.2E-13	7.2E-14	6.4E-14
Tellurium	3.25E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	6.50E-09	3.5E-05	N/A	1.2E-11	2.3E-11	2.0E-11	1.2E-11	1.1E-11
Titanium	3.31E-05	2.1E+00	N/A	1.0E-12	2.0E-12	1.7E-12	1.0E-12	9.3E-13
Uranium	3.06E-08	8.0E-04	N/A	2.4E-12	4.8E-12	4.2E-12	2.5E-12	2.2E-12
Vanadium	1.77E-06	8.0E-04	N/A	1.4E-10	2.8E-10	2.4E-10	1.4E-10	1.3E-10
Zinc	5.09E-06	7.0E-04	N/A	4.7E-10	9.1E-10	8.0E-10	4.7E-10	4.3E-10

Table F8. Calculation of Carcinogenic Hazard from Direct Contact with Soil and Inhalation of Air Particulate by the Recreational User – Baseline

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Cancer Risk				
				Infant	Toddler	Child	Teen	Adult
Recreational User - Incidental Soil Ingestion								
Arsenic	7.29E+01	1.8E+00	N/A	1.2E-07	1.6E-06	4.2E-07	3.3E-07	2.1E-06
Recreational User - Dermal Contact with Soil								
Arsenic	7.29E+01	1.8E+00	3.0E-02	8.1E-09	4.2E-08	6.6E-08	7.5E-08	5.5E-07
Recreational User - Inhalation of Particulate								
	Air Concentration (mg/m^3)							
Arsenic	7.29E-07	2.7E+01	N/A	1.8E-09	2.5E-08	4.6E-08	3.9E-08	2.7E-07
Cadmium	1.35E-08	4.2E+01	N/A	5.2E-11	7.2E-10	1.3E-09	1.1E-09	7.7E-09
Chromium	1.09E-06	4.6E+01	N/A	4.6E-09	6.4E-08	1.2E-07	9.8E-08	6.8E-07
Nickel	5.53E-07	7.1E-01	N/A	3.6E-11	5.0E-10	9.2E-10	7.7E-10	5.3E-09

Table F9. Calculation of Carcinogenic Hazard from Direct Contact with Soil and Inhalation of Air Particulate by the Recreational User – Predicted

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Cancer Risk				
				Infant	Toddler	Child	Teen	Adult
Recreational - Incidental Soil Ingestion								
Arsenic	7.37E+01	1.8E+00	N/A	1.2E-07	1.6E-06	4.3E-07	3.3E-07	2.2E-06
Recreational - Dermal Contact with Soil								
Arsenic	7.37E+01	1.8E+00	3.0E-02	8.2E-09	4.2E-08	6.7E-08	7.6E-08	5.6E-07
Recreational - Inhalation of Particulate								
	Air Concentration (mg/m^3)							
Arsenic	1.69E-06	2.7E+01	N/A	4.2E-09	5.8E-08	1.1E-07	9.0E-08	6.2E-07
Cadmium	4.15E-08	4.2E+01	N/A	1.6E-10	2.2E-09	4.1E-09	3.4E-09	2.4E-08
Chromium	1.68E-06	4.6E+01	N/A	7.1E-09	9.9E-08	1.8E-07	1.5E-07	1.0E-06
Nickel	8.53E-07	7.1E-01	N/A	5.6E-11	7.7E-10	1.4E-09	1.2E-09	8.2E-09

Table F10. Calculation of Non-Carcinogenic Hazard from Direct Contact with Soil and Inhalation of Air Particulate by the Summer Resident – Baseline

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Summer Resident - Incidental Soil Ingestion								
Aluminum	2.92E+04	1.0E+00	N/A	3.6E-02	7.1E-02	8.9E-03	4.9E-03	4.1E-03
Antimony	7.40E+00	4.0E-04	N/A	2.3E-02	4.5E-02	5.6E-03	3.1E-03	2.6E-03
Arsenic	7.29E+01	1.0E-03	N/A	8.9E-02	1.8E-01	2.2E-02	1.2E-02	1.0E-02
Barium	4.69E+02	2.0E-01	N/A	2.9E-03	5.7E-03	7.1E-04	3.9E-04	3.3E-04
Bismuth	3.19E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	2.00E+01	2.0E-01	N/A	1.2E-04	2.4E-04	3.0E-05	1.7E-05	1.4E-05
Cadmium	1.35E+00	1.0E-03	N/A	1.6E-03	3.3E-03	4.1E-04	2.3E-04	1.9E-04
Chromium	1.09E+02	3.0E-03	N/A	4.4E-02	8.8E-02	1.1E-02	6.1E-03	5.1E-03
Cobalt	2.30E+01	1.4E-03	N/A	2.0E-02	4.0E-02	5.0E-03	2.8E-03	2.3E-03
Iron	5.71E+04	7.0E-01	N/A	9.9E-02	2.0E-01	2.5E-02	1.4E-02	1.2E-02
Lead	4.27E+01	3.6E-03	N/A	1.4E-02	2.9E-02	3.6E-03	2.0E-03	1.7E-03
Manganese	9.19E+02	0.156	N/A	7.2E-03	1.4E-02	1.8E-03	9.9E-04	8.3E-04
Mercury	9.20E-02	3.0E-04	N/A	3.7E-04	7.4E-04	9.3E-05	5.1E-05	4.3E-05
Nickel	5.53E+01	1.10E-02	N/A	6.1E-03	1.2E-02	1.5E-03	8.4E-04	7.1E-04
Selenium	4.70E+00	3.0E-04	N/A	1.9E-02	3.8E-02	4.8E-03	2.6E-03	2.2E-03
Strontium	9.56E+01	0.6	N/A	1.9E-04	3.9E-04	4.8E-05	2.7E-05	2.3E-05
Tellurium	7.01E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	3.20E-01	7.0E-05	N/A	5.6E-03	1.1E-02	1.4E-03	7.7E-04	6.5E-04
Titanium	2.25E+03	3.0E+00	N/A	9.1E-04	1.8E-03	2.3E-04	1.3E-04	1.1E-04
Uranium	1.17E+00	6.0E-04	N/A	2.4E-03	4.7E-03	5.9E-04	3.3E-04	2.8E-04
Vanadium	1.11E+02	5.0E-03	N/A	2.7E-02	5.4E-02	6.8E-03	3.7E-03	3.2E-03

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Zinc	2.37E+02	5.0E-01	N/A	5.8E-04	1.2E-03	1.4E-04	7.9E-05	6.7E-05
Summer Resident - Dermal Contact with Soil								
Aluminum	1.11E+02	1.0E+00	1.0E-02	3.2E-06	2.0E-06	1.8E-06	1.4E-06	1.3E-06
Antimony	7.40E+00	4.0E-04	1.0E-02	5.3E-04	3.4E-04	2.9E-04	2.4E-04	2.2E-04
Arsenic	7.29E+01	1.0E-03	3.0E-02	6.2E-03	4.0E-03	3.5E-03	2.8E-03	2.6E-03
Barium	4.69E+02	2.0E-01	1.0E-01	6.7E-04	4.2E-04	3.7E-04	3.0E-04	2.8E-04
Bismuth	3.19E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	2.00E+01	2.0E-01	1.0E-02	2.8E-06	1.8E-06	1.6E-06	1.3E-06	1.2E-06
Cadmium	1.35E+00	1.0E-03	1.0E-02	3.8E-05	2.4E-05	2.1E-05	1.7E-05	1.6E-05
Chromium	1.09E+02	3.0E-03	1.0E-02	1.0E-03	6.6E-04	5.8E-04	4.6E-04	4.4E-04
Cobalt	2.30E+01	1.4E-03	1.0E-02	4.7E-04	3.0E-04	2.6E-04	2.1E-04	2.0E-04
Iron	5.71E+04	7.0E-01	1.0E-02	2.3E-03	1.5E-03	1.3E-03	1.0E-03	9.9E-04
Lead	4.27E+01	3.6E-03	1.0E-02	3.4E-04	2.1E-04	1.9E-04	1.5E-04	1.4E-04
Manganese	9.19E+02	0.156	1.0E-02	1.7E-04	1.1E-04	9.4E-05	7.5E-05	7.1E-05
Mercury	9.20E-02	3.0E-04	1.0E+00	8.7E-04	5.6E-04	4.9E-04	3.9E-04	3.7E-04
Nickel	5.53E+01	1.10E-02	9.0E-02	1.3E-03	8.2E-04	7.2E-04	5.8E-04	5.5E-04
Selenium	4.70E+00	3.0E-04	1.0E-02	4.5E-04	2.8E-04	2.5E-04	2.0E-04	1.9E-04
Strontium	9.56E+01	0.6	1.0E-02	4.5E-06	2.9E-06	2.5E-06	2.0E-06	1.9E-06
Tellurium	7.01E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	3.20E-01	7.0E-05	1.0E-02	1.3E-04	8.3E-05	7.3E-05	5.8E-05	5.5E-05
Titanium	2.25E+03	3.0E+00	1.0E-02	2.1E-05	1.4E-05	1.2E-05	9.5E-06	9.1E-06
Uranium	1.17E+00	6.0E-04	1.0E-02	5.5E-05	3.5E-05	3.1E-05	2.5E-05	2.4E-05
Vanadium	1.11E+02	5.0E-03	1.0E-02	6.3E-04	4.0E-04	3.5E-04	2.8E-04	2.7E-04
Zinc	2.37E+02	5.0E-01	1.0E-01	1.3E-04	8.6E-05	7.5E-05	6.0E-05	5.7E-05

Constituent	Air Concentration (mg/m^3)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Summer Resident - Inhalation of Particulate								
Aluminum	2.92E-04	5.0E-03	N/A	7.5E-09	1.5E-08	1.3E-08	7.6E-09	6.9E-09
Antimony	7.40E-08	1.4E-03	N/A	6.8E-12	1.3E-11	1.2E-11	6.9E-12	6.2E-12
Arsenic	7.29E-07	1.0E-03	N/A	9.3E-11	1.8E-10	1.6E-10	9.5E-11	8.6E-11
Barium	4.69E-06	2.0E-01	N/A	3.0E-12	5.9E-12	5.2E-12	3.1E-12	2.8E-12
Bismuth	3.19E-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	3.40E-08	7.0E-01	N/A	6.2E-15	1.2E-14	1.1E-14	6.3E-15	5.7E-15
Cadmium	1.35E-08	3.5E-03	N/A	4.9E-13	9.7E-13	8.5E-13	5.0E-13	4.5E-13
Chromium	1.09E-06	6.0E-02	N/A	2.3E-12	4.6E-12	4.0E-12	2.4E-12	2.1E-12
Cobalt	2.30E-07	4.9E-03	N/A	6.0E-12	1.2E-11	1.0E-11	6.1E-12	5.5E-12
Iron	5.71E-04	2.5E+00	N/A	3.0E-11	5.9E-11	5.1E-11	3.0E-11	2.7E-11
Lead	4.27E-07	1.3E-02	N/A	4.3E-12	8.5E-12	7.5E-12	4.4E-12	4.0E-12
Manganese	9.19E-06	0.546	N/A	2.2E-12	4.2E-12	3.7E-12	2.2E-12	2.0E-12
Mercury	9.20E-10	1.1E-03	N/A	1.1E-13	2.2E-13	1.9E-13	1.1E-13	1.0E-13
Nickel	5.53E-07	3.00E-02	N/A	2.4E-12	4.6E-12	4.1E-12	2.4E-12	2.2E-12
Selenium	4.70E-08	3.0E-02	N/A	2.0E-13	3.9E-13	3.5E-13	2.0E-13	1.8E-13
Strontium	3.25E-07	2.1E+00	N/A	2.0E-14	3.9E-14	3.4E-14	2.0E-14	1.8E-14
Tellurium	7.01E-09	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	3.20E-09	3.5E-05	N/A	1.2E-11	2.3E-11	2.0E-11	1.2E-11	1.1E-11
Titanium	2.25E-05	2.1E+00	N/A	1.4E-12	2.7E-12	2.4E-12	1.4E-12	1.3E-12
Uranium	3.99E-09	8.0E-04	N/A	6.4E-13	1.3E-12	1.1E-12	6.5E-13	5.9E-13
Vanadium	1.11E-06	8.0E-04	N/A	1.8E-10	3.5E-10	3.1E-10	1.8E-10	1.6E-10
Zinc	2.37E-06	7.0E-04	N/A	4.3E-10	8.5E-10	7.5E-10	4.4E-10	4.0E-10

Table F11. Calculation of Non-Carcinogenic Hazard from Direct Contact with Soil and Inhalation of Air Particulate by the Summer Resident – Predicted

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Summer Resident - Incidental Soil Ingestion								
Aluminum	2.94E+04	1.0E+00	N/A	3.6E-02	7.1E-02	8.9E-03	4.9E-03	4.2E-03
Antimony	7.47E+00	4.0E-04	N/A	2.3E-02	4.5E-02	5.7E-03	3.1E-03	2.6E-03
Arsenic	7.37E+01	1.0E-03	N/A	9.0E-02	1.8E-01	2.2E-02	1.2E-02	1.0E-02
Barium	4.72E+02	2.0E-01	N/A	2.9E-03	5.7E-03	7.2E-04	4.0E-04	3.3E-04
Bismuth	3.28E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	2.03E+01	2.0E-01	N/A	1.2E-04	2.5E-04	3.1E-05	1.7E-05	1.4E-05
Cadmium	1.37E+00	1.0E-03	N/A	1.7E-03	3.3E-03	4.2E-04	2.3E-04	1.9E-04
Chromium	1.09E+02	3.0E-03	N/A	4.4E-02	8.8E-02	1.1E-02	6.1E-03	5.2E-03
Cobalt	2.32E+01	1.4E-03	N/A	2.0E-02	4.0E-02	5.0E-03	2.8E-03	2.3E-03
Iron	5.74E+04	7.0E-01	N/A	1.0E-01	2.0E-01	2.5E-02	1.4E-02	1.2E-02
Lead	4.30E+01	3.6E-03	N/A	1.5E-02	2.9E-02	3.6E-03	2.0E-03	1.7E-03
Manganese	9.26E+02	0.156	N/A	7.2E-03	1.4E-02	1.8E-03	9.9E-04	8.4E-04
Mercury	1.46E-01	3.0E-04	N/A	5.9E-04	1.2E-03	1.5E-04	8.1E-05	6.9E-05
Nickel	5.57E+01	1.10E-02	N/A	6.2E-03	1.2E-02	1.5E-03	8.5E-04	7.2E-04
Selenium	4.74E+00	3.0E-04	N/A	1.9E-02	3.8E-02	4.8E-03	2.6E-03	2.2E-03
Strontium	9.61E+01	0.6	N/A	2.0E-04	3.9E-04	4.9E-05	2.7E-05	2.3E-05
Tellurium	7.16E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	3.23E-01	7.0E-05	N/A	5.6E-03	1.1E-02	1.4E-03	7.7E-04	6.5E-04
Titanium	2.26E+03	3.0E+00	N/A	9.2E-04	1.8E-03	2.3E-04	1.3E-04	1.1E-04
Uranium	1.19E+00	6.0E-04	N/A	2.4E-03	4.8E-03	6.0E-04	3.3E-04	2.8E-04
Vanadium	1.12E+02	5.0E-03	N/A	2.7E-02	5.4E-02	6.8E-03	3.8E-03	3.2E-03

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Zinc	2.39E+02	5.0E-01	N/A	5.8E-04	1.2E-03	1.5E-04	8.0E-05	6.8E-05
Summer Resident - Dermal Contact with Soil								
Aluminum	2.94E+04	1.0E+00	1.0E-02	8.4E-04	5.3E-04	4.7E-04	3.7E-04	3.6E-04
Antimony	7.47E+00	4.0E-04	1.0E-02	5.3E-04	3.4E-04	3.0E-04	2.4E-04	2.3E-04
Arsenic	7.37E+01	1.0E-03	3.0E-02	6.3E-03	4.0E-03	3.5E-03	2.8E-03	2.7E-03
Barium	4.72E+02	2.0E-01	1.0E-01	6.7E-04	4.3E-04	3.7E-04	3.0E-04	2.9E-04
Bismuth	3.28E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	2.03E+01	2.0E-01	1.0E-02	2.9E-06	1.8E-06	1.6E-06	1.3E-06	1.2E-06
Cadmium	1.37E+00	1.0E-03	1.0E-02	3.9E-05	2.5E-05	2.2E-05	1.7E-05	1.7E-05
Chromium	1.09E+02	3.0E-03	1.0E-02	1.0E-03	6.6E-04	5.8E-04	4.6E-04	4.4E-04
Cobalt	2.32E+01	1.4E-03	1.0E-02	4.7E-04	3.0E-04	2.6E-04	2.1E-04	2.0E-04
Iron	5.74E+04	7.0E-01	1.0E-02	2.3E-03	1.5E-03	1.3E-03	1.0E-03	9.9E-04
Lead	4.30E+01	3.6E-03	1.0E-02	3.4E-04	2.2E-04	1.9E-04	1.5E-04	1.4E-04
Manganese	9.26E+02	0.156	1.0E-02	1.7E-04	1.1E-04	9.4E-05	7.6E-05	7.2E-05
Mercury	1.46E-01	3.0E-04	1.0E+00	1.4E-03	8.8E-04	7.7E-04	6.2E-04	5.9E-04
Nickel	5.57E+01	1.10E-02	9.0E-02	1.3E-03	8.3E-04	7.2E-04	5.8E-04	5.5E-04
Selenium	4.74E+00	3.0E-04	1.0E-02	4.5E-04	2.9E-04	2.5E-04	2.0E-04	1.9E-04
Strontium	9.61E+01	0.6	1.0E-02	4.6E-06	2.9E-06	2.5E-06	2.0E-06	1.9E-06
Tellurium	7.16E-01	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	3.23E-01	7.0E-05	1.0E-02	1.3E-04	8.4E-05	7.3E-05	5.9E-05	5.6E-05
Titanium	2.26E+03	3.0E+00	1.0E-02	2.1E-05	1.4E-05	1.2E-05	9.6E-06	9.1E-06
Uranium	1.19E+00	6.0E-04	1.0E-02	5.6E-05	3.6E-05	3.1E-05	2.5E-05	2.4E-05
Vanadium	1.12E+02	5.0E-03	1.0E-02	6.4E-04	4.1E-04	3.6E-04	2.9E-04	2.7E-04
Zinc	2.39E+02	5.0E-01	1.0E-01	1.4E-04	8.7E-05	7.6E-05	6.1E-05	5.8E-05

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Summer Resident - Inhalation of Particulate								
	Air Concentration (mg/m^3)							
Aluminum	4.54E-04	5.0E-03	N/A	1.2E-08	2.3E-08	2.0E-08	1.2E-08	1.1E-08
Antimony	1.67E-07	1.4E-03	N/A	1.5E-11	3.0E-11	2.6E-11	1.6E-11	1.4E-11
Arsenic	1.69E-06	1.0E-03	N/A	2.2E-10	4.3E-10	3.7E-10	2.2E-10	2.0E-10
Barium	7.26E-06	2.0E-01	N/A	4.6E-12	9.1E-12	8.0E-12	4.7E-12	4.3E-12
Bismuth	1.90E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	2.49E-07	7.0E-01	N/A	4.6E-14	8.9E-14	7.8E-14	4.6E-14	4.2E-14
Cadmium	4.15E-08	3.5E-03	N/A	1.5E-12	3.0E-12	2.6E-12	1.6E-12	1.4E-12
Chromium	1.68E-06	6.0E-02	N/A	3.6E-12	7.0E-12	6.2E-12	3.7E-12	3.3E-12
Cobalt	3.53E-07	4.9E-03	N/A	9.2E-12	1.8E-11	1.6E-11	9.4E-12	8.5E-12
Iron	8.82E-04	2.5E+00	N/A	4.6E-11	9.1E-11	7.9E-11	4.7E-11	4.2E-11
Lead	7.20E-07	1.3E-02	N/A	7.3E-12	1.4E-11	1.3E-11	7.5E-12	6.7E-12
Manganese	1.49E-05	0.546	N/A	3.5E-12	6.9E-12	6.0E-12	3.6E-12	3.2E-12
Mercury	1.18E-07	1.1E-03	N/A	1.4E-11	2.8E-11	2.5E-11	1.5E-11	1.3E-11
Nickel	8.53E-07	3.00E-02	N/A	3.6E-12	7.2E-12	6.3E-12	3.7E-12	3.3E-12
Selenium	8.40E-08	3.0E-02	N/A	3.6E-13	7.0E-13	6.2E-13	3.7E-13	3.3E-13
Strontuim	2.30E-06	2.1E+00	N/A	1.4E-13	2.8E-13	2.4E-13	1.4E-13	1.3E-13
Tellurium	3.25E-08	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	6.50E-09	3.5E-05	N/A	2.4E-11	4.7E-11	4.1E-11	2.4E-11	2.2E-11
Titanium	3.31E-05	2.1E+00	N/A	2.0E-12	4.0E-12	3.5E-12	2.1E-12	1.9E-12
Uranium	3.06E-08	8.0E-04	N/A	4.9E-12	9.6E-12	8.4E-12	5.0E-12	4.5E-12
Vanadium	1.77E-06	8.0E-04	N/A	2.8E-10	5.6E-10	4.9E-10	2.9E-10	2.6E-10
Zinc	5.09E-06	7.0E-04	N/A	9.3E-10	1.8E-09	1.6E-09	9.5E-10	8.5E-10

Table F12. Calculation of Carcinogenic Hazard from Direct Contact with Soil and Inhalation of Air Particulate by the Summer Resident - Baseline

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Cancer Risk				
				Infant	Toddler	Child	Teen	Adult
Summer Resident - Incidental Soil Ingestion								
Arsenic	7.29E+01	1.8E+00	N/A	5.0E-07	7.0E-06	1.4E-08	1.4E-06	9.3E-06
Summer Resident - Dermal Contact with Soil								
Arsenic	7.29E+01	1.8E+00	3.0E-02	3.5E-08	1.6E-07	2.9E-07	3.3E-07	2.4E-06
Summer Resident - Inhalation of Particulate								
	Air Concentration (mg/m^3)							
Arsenic	7.29E-07	2.7E+01	N/A	7.9E-09	1.1E-07	2.0E-07	1.7E-07	1.2E-06
Cadmium	1.35E-08	4.2E+01	N/A	2.3E-10	3.1E-09	5.7E-09	4.8E-09	3.3E-08
Chromium	1.09E-06	4.6E+01	N/A	2.0E-08	2.8E-07	5.1E-07	4.3E-07	2.9E-06
Nickel	5.53E-07	7.1E-01	N/A	1.6E-10	2.2E-09	4.0E-09	3.3E-09	2.3E-08

Table F13. Calculation of Carcinogenic Hazard from Direct Contact with Soil and Inhalation of Air Particulate by the Summer Resident - Predicted

Constituent	Soil Concentration (mg/kg)	TRV	DAF	Cancer Risk				
				Infant	Toddler	Child	Teen	Adult
Summer Resident - Incidental Soil Ingestion								
Arsenic	7.37E+01	1.8E+00	N/A	5.1E-07	7.1E-06	1.9E-06	1.4E-06	9.4E-06
Summer Resident - Dermal Contact with Soil								
Arsenic	7.37E+01	1.8E+00	3.0E-02	3.5E-08	1.6E-07	2.9E-07	3.3E-07	2.4E-06
Summer Resident - Inhalation of Particulate								
	Air Concentration (mg/m^3)							
Arsenic	1.69E-06	2.7E+01	N/A	1.8E-08	2.5E-07	4.6E-07	3.9E-07	2.7E-06
Cadmium	4.15E-08	4.2E+01	N/A	7.0E-10	9.7E-09	1.8E-08	1.5E-08	1.0E-07
Chromium	1.68E-06	4.6E+01	N/A	3.1E-08	4.3E-07	7.8E-07	6.6E-07	4.5E-06
Nickel	8.53E-07	7.1E-01	N/A	2.4E-10	3.4E-09	6.1E-09	5.2E-09	3.6E-08

Table F14. Calculation of Non-Carcinogenic Hazard from Direct Contact with Surface Water by the Hunter/Trapper/Fisher – Baseline

Constituent	Surface Water (mg/L)	TRV	DAF	Hazard Quotient	
				Teen	Adult
Hunter/Trapper/Fisher - Ingestion Surface Water					
Aluminum	5.89E+00	1.0E+00	N/A	6.6E-02	8.3E-02
Antimony	2.05E-03	4.0E-04	N/A	5.7E-02	7.3E-02
Arsenic	8.45E-03	1.0E-03	N/A	9.4E-02	1.2E-01
Barium	1.13E-01	2.0E-01	N/A	6.3E-03	8.0E-03
Bismuth	8.36E-03	N/A	N/A	N/A	N/A
Boron	9.19E-02	2.0E-01	N/A	5.1E-03	6.5E-03
Cadmium	4.83E-04	1.0E-03	N/A	5.4E-03	6.8E-03
Chromium	6.68E-03	3.0E-03	N/A	2.5E-02	3.2E-02
Cobalt	5.03E-03	1.4E-03	N/A	4.0E-02	5.1E-02
Iron	9.17E+00	7.0E-01	N/A	1.5E-01	1.9E-01
Lead	6.83E-03	3.6E-03	N/A	2.1E-02	2.7E-02
Manganese	2.94E-01	0.156	N/A	2.1E-02	2.7E-02
Mercury	1.21E-05	3.0E-04	N/A	4.5E-04	5.7E-04
Nickel	2.06E-02	1.10E-02	N/A	2.1E-02	2.6E-02
Selenium	2.30E-03	3.0E-04	N/A	8.6E-02	1.1E-01
Strontium	2.69E-01	6.0E-01	N/A	5.0E-03	6.3E-03
Tellurium	N/A	N/A	N/A	N/A	N/A
Thallium	1.84E-04	7.0E-05	N/A	2.9E-02	3.7E-02
Titanium	9.82E-02	3.0E+00	N/A	3.7E-04	4.6E-04
Uranium	5.00E-04	6.0E-04	N/A	9.3E-03	1.2E-02
Vanadium	1.35E-02	5.0E-03	N/A	3.0E-02	3.8E-02

Constituent	Surface Water (mg/L)	TRV	DAF	Hazard Quotient	
				Teen	Adult
Zinc	5.81E-02	5.0E-01	N/A	1.3E-03	1.6E-03
Hunter/Trapper/Fisher - Dermal Contact with Surface Water					
Aluminum	5.89E+00	1.0E+00	1.0E-02	2.0E-03	1.9E-03
Antimony	2.05E-03	4.0E-04	1.0E-02	1.7E-03	1.6E-03
Arsenic	8.45E-03	1.0E-03	3.0E-02	8.6E-03	8.1E-03
Barium	1.13E-01	2.0E-01	1.0E-01	1.9E-03	1.8E-03
Bismuth	8.36E-03	N/A	N/A	N/A	N/A
Boron	9.19E-02	2.0E-01	1.0E-02	1.6E-04	1.5E-04
Cadmium	4.83E-04	1.0E-03	1.0E-02	1.6E-04	1.5E-04
Chromium	6.68E-03	3.0E-03	1.0E-02	7.5E-04	7.1E-04
Cobalt	5.03E-03	1.4E-03	1.0E-02	1.2E-03	1.1E-03
Iron	9.17E+00	7.0E-01	1.0E-02	4.4E-03	4.2E-03
Lead	6.83E-03	3.6E-03	1.0E-02	6.4E-04	6.1E-04
Manganese	2.94E-01	0.156	1.0E-02	6.4E-04	6.0E-04
Mercury	1.21E-05	3.0E-04	1.0E+00	1.4E-03	1.3E-03
Nickel	2.06E-02	1.10E-02	9.0E-02	5.7E-03	5.4E-03
Selenium	2.30E-03	3.0E-04	1.0E-02	2.6E-03	2.4E-03
Strontium	2.69E-01	6.0E-01	1.0E-02	1.5E-04	1.4E-04
Tellurium	N/A	N/A	N/A	N/A	N/A
Thallium	1.84E-04	7.0E-05	1.0E-02	8.9E-04	8.4E-04
Titanium	9.82E-02	3.0E+00	1.0E-02	1.1E-05	1.0E-05
Uranium	5.00E-04	6.0E-04	1.0E-02	2.8E-04	2.7E-04
Vanadium	1.35E-02	5.0E-03	1.0E-02	9.1E-04	8.6E-04
Zinc	5.81E-02	5.0E-01	1.0E-01	3.9E-04	3.7E-04

Table F15. Calculation of Non-Carcinogenic Hazard from Direct Contact with Surface Water by the Hunter/Trapper/Fisher - Predicted Future

Constituent	Surface Water (mg/L)	TRV	DAF	Hazard Quotient	
				Teen	Adult
Hunter/Trapper/Fisher - Ingestion Surface Water					
Aluminum	6.15E+00	1.0E+00	N/A	6.9E-02	8.7E-02
Antimony	5.74E-03	4.0E-04	N/A	1.6E-01	2.0E-01
Arsenic	9.79E-03	1.0E-03	N/A	1.1E-01	1.4E-01
Barium	1.19E-01	2.0E-01	N/A	6.6E-03	8.4E-03
Bismuth	8.44E-03	N/A	N/A	N/A	N/A
Boron	9.57E-02	2.0E-01	N/A	5.3E-03	6.8E-03
Cadmium	1.33E-03	1.0E-03	N/A	1.5E-02	1.9E-02
Chromium	7.62E-03	3.0E-03	N/A	2.8E-02	3.6E-02
Cobalt	6.44E-03	1.4E-03	N/A	5.1E-02	6.5E-02
Iron	9.66E+00	7.0E-01	N/A	1.5E-01	2.0E-01
Lead	7.78E-03	3.6E-03	N/A	2.4E-02	3.1E-02
Manganese	5.38E-01	0.156	N/A	3.8E-02	4.9E-02
Mercury	6.91E-05	3.0E-04	N/A	2.6E-03	3.3E-03
Nickel	2.72E-02	1.10E-02	N/A	2.8E-02	3.5E-02
Selenium	3.26E-03	3.0E-04	N/A	1.2E-01	1.5E-01
Strontium	2.96E-01	6.0E-01	N/A	5.5E-03	7.0E-03
Tellurium	N/A	N/A	N/A	N/A	N/A
Thallium	1.92E-04	7.0E-05	N/A	3.1E-02	3.9E-02
Titanium	1.01E-01	3.0E+00	N/A	3.7E-04	4.7E-04
Uranium	5.00E-04	6.0E-04	N/A	9.3E-03	1.2E-02
Vanadium	1.37E-02	5.0E-03	N/A	3.1E-02	3.9E-02

Constituent	Surface Water (mg/L)	TRV	DAF	Hazard Quotient	
				Teen	Adult
Zinc	1.13E-01	5.0E-01	N/A	2.5E-03	3.2E-03
Hunter/Trapper/Fisher - Dermal Contact with Surface Water					
Aluminum	6.15E+00	1.0E+00	1.0E-02	2.1E-03	2.0E-03
Antimony	5.74E-03	4.0E-04	1.0E-02	4.9E-03	4.6E-03
Arsenic	9.79E-03	1.0E-03	3.0E-02	9.9E-03	9.4E-03
Barium	1.19E-01	2.0E-01	1.0E-01	2.0E-03	1.9E-03
Bismuth	8.44E-03	N/A	N/A	N/A	N/A
Boron	9.57E-02	2.0E-01	1.0E-02	1.6E-04	1.5E-04
Cadmium	1.33E-03	1.0E-03	1.0E-02	4.5E-04	4.3E-04
Chromium	7.62E-03	3.0E-03	1.0E-02	8.6E-04	8.1E-04
Cobalt	6.44E-03	1.4E-03	1.0E-02	1.6E-03	1.5E-03
Iron	9.66E+00	7.0E-01	1.0E-02	4.7E-03	4.4E-03
Lead	7.78E-03	3.6E-03	1.0E-02	7.3E-04	6.9E-04
Manganese	5.38E-01	0.156	1.0E-02	1.2E-03	1.1E-03
Mercury	6.91E-05	3.0E-04	1.0E+00	7.8E-03	7.4E-03
Nickel	2.72E-02	1.10E-02	9.0E-02	7.5E-03	7.1E-03
Selenium	3.26E-03	3.0E-04	1.0E-02	3.7E-03	3.5E-03
Strontium	2.96E-01	6.0E-01	1.0E-02	1.7E-04	1.6E-04
Tellurium	N/A	N/A	N/A	N/A	N/A
Thallium	1.92E-04	7.0E-05	1.0E-02	9.3E-04	8.8E-04
Titanium	1.01E-01	3.0E+00	1.0E-02	1.1E-05	1.1E-05
Uranium	5.00E-04	6.0E-04	1.0E-02	2.8E-04	2.7E-04
Vanadium	1.37E-02	5.0E-03	1.0E-02	9.3E-04	8.8E-04
Zinc	1.13E-01	5.0E-01	1.0E-01	7.7E-04	7.2E-04

Table F16. Calculation of Carcinogenic Hazard from Direct Contact with Surface Water by the Hunter/Trapper/Fisher – Baseline

Constituent	Surface Water (mg/L)	TRV	DAF	Cancer Risk	
				Teen	Adult
Hunter/Trapper/Fisher - Ingestion Surface Water					
Arsenic	8.45E-03	1.8E+00	N/A	5.1E-06	5.0E-05
Hunter/Trapper/Fisher - Dermal Contact with Surface Water					
Arsenic	8.45E-03	1.8E+00	3.0E-02	4.6E-07	3.4E-06

Table F17. Calculation of Carcinogenic Hazard from Direct Contact with Surface Water by the Hunter/Trapper/Fisher - Predicted Future

Constituent	Surface Water (mg/L)	TRV	DAF	Cancer Risk	
				Teen	Adult
Hunter/Trapper/Fisher - Ingestion Surface Water					
Arsenic	9.79E-03	1.8E+00	N/A	5.9E-06	5.8E-05
Hunter/Trapper/Fisher - Dermal Contact with Surface Water					
Arsenic	9.79E-03	1.8E+00	3.0E-02	5.4E-07	3.9E-06

Table F18. Calculation of Non-Carcinogenic Hazard from Direct Contact with Surface Water by the Recreational User – Baseline

Constituent	Surface Water (mg/L)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Recreational - Ingestion Surface Water								
Aluminum	5.89E+00	1.0E+00	N/A	5.4E-02	5.4E-02	3.6E-02	2.5E-02	3.1E-02
Antimony	2.05E-03	4.0E-04	N/A	4.7E-02	4.7E-02	3.1E-02	2.1E-02	2.7E-02
Arsenic	8.45E-03	1.0E-03	N/A	7.7E-02	7.7E-02	5.1E-02	3.5E-02	4.5E-02
Barium	1.13E-01	2.0E-01	N/A	5.2E-03	5.1E-03	3.4E-03	2.4E-03	3.0E-03
Bismuth	8.36E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	9.19E-02	2.0E-01	N/A	4.2E-03	4.2E-03	2.8E-03	1.9E-03	2.4E-03
Cadmium	4.83E-04	1.0E-03	N/A	4.4E-03	4.4E-03	2.9E-03	2.0E-03	2.6E-03
Chromium	6.68E-03	3.0E-03	N/A	2.0E-02	2.0E-02	1.4E-02	9.3E-03	1.2E-02
Cobalt	5.03E-03	1.4E-03	N/A	3.3E-02	3.3E-02	2.2E-02	1.5E-02	1.9E-02
Iron	9.17E+00	7.0E-01	N/A	1.2E-01	1.2E-01	8.0E-02	5.5E-02	6.9E-02
Lead	6.83E-03	3.6E-03	N/A	1.7E-02	1.7E-02	1.2E-02	7.9E-03	1.0E-02
Manganese	2.94E-01	0.156	N/A	1.7E-02	1.7E-02	1.1E-02	7.9E-03	1.0E-02
Mercury	1.21E-05	3.0E-04	N/A	3.7E-04	3.7E-04	2.5E-04	1.7E-04	2.1E-04
Nickel	2.06E-02	1.10E-02	N/A	1.7E-02	1.7E-02	1.1E-02	7.8E-03	9.9E-03
Selenium	2.30E-03	3.0E-04	N/A	7.0E-02	7.0E-02	4.7E-02	3.2E-02	4.1E-02
Strontium	2.69E-01	6.0E-01	N/A	4.1E-03	4.1E-03	2.7E-03	1.9E-03	2.4E-03
Tellurium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	1.84E-04	7.0E-05	N/A	2.4E-02	2.4E-02	1.6E-02	1.1E-02	1.4E-02
Titanium	9.82E-02	3.0E+00	N/A	3.0E-04	3.0E-04	2.0E-04	1.4E-04	1.7E-04
Uranium	5.00E-04	6.0E-04	N/A	7.6E-03	7.6E-03	5.1E-03	3.5E-03	4.4E-03
Vanadium	1.35E-02	5.0E-03	N/A	2.5E-02	2.4E-02	1.6E-02	1.1E-02	1.4E-02
Zinc	5.81E-02	5.0E-01	N/A	1.1E-03	1.1E-03	7.1E-04	4.9E-04	6.2E-04

Constituent	Surface Water (mg/L)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Recreational - Dermal Contact with Surface Water								
Aluminum	5.89E+00	1.0E+00	1.0E-02	1.6E-03	1.3E-03	1.2E-03	9.9E-04	9.5E-04
Antimony	2.05E-03	4.0E-04	1.0E-02	1.4E-03	1.2E-03	1.0E-03	8.6E-04	8.3E-04
Arsenic	8.45E-03	1.0E-03	3.0E-02	6.9E-03	5.8E-03	5.0E-03	4.2E-03	4.1E-03
Barium	1.13E-01	2.0E-01	1.0E-01	1.5E-03	1.3E-03	1.1E-03	9.5E-04	9.1E-04
Bismuth	8.36E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	9.19E-02	2.0E-01	1.0E-02	1.2E-04	1.0E-04	9.0E-05	7.7E-05	7.4E-05
Cadmium	4.83E-04	1.0E-03	1.0E-02	1.3E-04	1.1E-04	9.4E-05	8.1E-05	7.8E-05
Chromium	6.68E-03	1.0E-03	1.0E-02	1.8E-03	1.5E-03	1.3E-03	1.1E-03	1.1E-03
Cobalt	5.03E-03	1.4E-03	1.0E-02	9.7E-04	8.2E-04	7.0E-04	6.0E-04	5.8E-04
Iron	9.17E+00	7.0E-01	1.0E-02	3.6E-03	3.0E-03	2.6E-03	2.2E-03	2.1E-03
Lead	6.83E-03	3.6E-03	1.0E-02	5.2E-04	4.3E-04	3.7E-04	3.2E-04	3.1E-04
Manganese	2.94E-01	0.156	1.0E-02	5.1E-04	4.3E-04	3.7E-04	3.2E-04	3.0E-04
Mercury	1.21E-05	3.0E-04	1.0E+00	1.1E-03	9.2E-04	7.9E-04	6.8E-04	6.5E-04
Nickel	2.06E-02	1.10E-02	9.0E-02	4.6E-03	3.8E-03	3.3E-03	2.8E-03	2.7E-03
Selenium	2.30E-03	3.0E-04	1.0E-02	2.1E-03	1.7E-03	1.5E-03	1.3E-03	1.2E-03
Strontium	2.69E-01	6.0E-01	1.0E-02	1.2E-04	1.0E-04	8.8E-05	7.5E-05	7.2E-05
Tellurium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	1.84E-04	7.0E-05	1.0E-02	7.1E-04	6.0E-04	5.1E-04	4.4E-04	4.2E-04
Titanium	9.82E-02	3.0E+00	1.0E-02	8.9E-06	7.5E-06	6.4E-06	5.5E-06	5.3E-06
Uranium	5.00E-04	6.0E-04	1.0E-02	2.3E-04	1.9E-04	1.6E-04	1.4E-04	1.3E-04
Vanadium	1.35E-02	5.0E-03	1.0E-02	7.3E-04	6.1E-04	5.3E-04	4.5E-04	4.3E-04
Zinc	5.81E-02	5.0E-01	1.0E-01	3.2E-04	2.6E-04	2.3E-04	1.9E-04	1.9E-04

Table F19. Calculation of Non-Carcinogenic Hazard from Direct Contact with Surface Water by the Recreational User - Predicted Future

Constituent	Surface Water (mg/L)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Recreational - Ingestion Surface Water								
Aluminum	6.15E+00	1.0E+00	N/A	5.6E-02	5.6E-02	3.7E-02	2.6E-02	3.3E-02
Antimony	5.74E-03	4.0E-04	N/A	1.3E-01	1.3E-01	8.7E-02	6.0E-02	7.6E-02
Arsenic	9.79E-03	1.0E-03	N/A	9.0E-02	8.9E-02	6.0E-02	4.1E-02	5.2E-02
Barium	1.19E-01	2.0E-01	N/A	5.4E-03	5.4E-03	3.6E-03	2.5E-03	3.1E-03
Bismuth	8.44E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	9.57E-02	2.0E-01	N/A	4.4E-03	4.4E-03	2.9E-03	2.0E-03	2.5E-03
Cadmium	1.33E-03	1.0E-03	N/A	1.2E-02	1.2E-02	8.1E-03	5.6E-03	7.1E-03
Chromium	7.62E-03	3.0E-03	N/A	2.3E-02	2.3E-02	1.5E-02	1.1E-02	1.3E-02
Cobalt	6.44E-03	1.4E-03	N/A	4.2E-02	4.2E-02	2.8E-02	1.9E-02	2.4E-02
Iron	9.66E+00	7.0E-01	N/A	1.3E-01	1.3E-01	8.4E-02	5.8E-02	7.3E-02
Lead	7.78E-03	3.6E-03	N/A	2.0E-02	2.0E-02	1.3E-02	9.1E-03	1.1E-02
Manganese	5.38E-01	0.156	N/A	3.2E-02	3.1E-02	2.1E-02	1.4E-02	1.8E-02
Mercury	6.91E-05	3.0E-04	N/A	2.1E-03	2.1E-03	1.4E-03	9.6E-04	1.2E-03
Nickel	2.72E-02	1.10E-02	N/A	2.3E-02	2.3E-02	1.5E-02	1.0E-02	1.3E-02
Selenium	3.26E-03	3.0E-04	N/A	9.9E-02	9.9E-02	6.6E-02	4.5E-02	5.8E-02
Strontium	2.96E-01	6.0E-01	N/A	4.5E-03	4.5E-03	3.0E-03	2.1E-03	2.6E-03
Tellurium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	1.92E-04	7.0E-05	N/A	2.5E-02	2.5E-02	1.7E-02	1.1E-02	1.5E-02
Titanium	1.01E-01	3.0E+00	N/A	3.1E-04	3.0E-04	2.0E-04	1.4E-04	1.8E-04
Uranium	5.00E-04	6.0E-04	N/A	7.6E-03	7.6E-03	5.1E-03	3.5E-03	4.4E-03
Vanadium	1.37E-02	5.0E-03	N/A	2.5E-02	2.5E-02	1.7E-02	1.1E-02	1.5E-02

Constituent	Surface Water (mg/L)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Zinc	1.13E-01	5.0E-01	N/A	2.1E-03	2.1E-03	1.4E-03	9.5E-04	1.2E-03
Recreational - Dermal Contact with Surface Water								
Aluminum	6.15E+00	1.0E+00	1.0E-02	1.7E-03	1.4E-03	1.2E-03	1.0E-03	9.9E-04
Antimony	5.74E-03	4.0E-04	1.0E-02	3.9E-03	3.3E-03	2.8E-03	2.4E-03	2.3E-03
Arsenic	9.79E-03	1.0E-03	3.0E-02	8.0E-03	6.7E-03	5.7E-03	4.9E-03	4.7E-03
Barium	1.19E-01	2.0E-01	1.0E-01	1.6E-03	1.4E-03	1.2E-03	9.9E-04	9.6E-04
Bismuth	8.44E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	9.57E-02	2.0E-01	1.0E-02	1.3E-04	1.1E-04	9.3E-05	8.0E-05	7.7E-05
Cadmium	1.33E-03	1.0E-03	1.0E-02	3.6E-04	3.0E-04	2.6E-04	2.2E-04	2.1E-04
Chromium	7.62E-03	1.0E-03	1.0E-02	2.1E-03	1.7E-03	1.5E-03	1.3E-03	1.2E-03
Cobalt	6.44E-03	1.4E-03	1.0E-02	1.2E-03	1.0E-03	9.0E-04	7.7E-04	7.4E-04
Iron	9.66E+00	7.0E-01	1.0E-02	3.7E-03	3.1E-03	2.7E-03	2.3E-03	2.2E-03
Lead	7.78E-03	3.6E-03	1.0E-02	5.9E-04	4.9E-04	4.2E-04	3.6E-04	3.5E-04
Manganese	5.38E-01	0.156	1.0E-02	9.4E-04	7.9E-04	6.7E-04	5.8E-04	5.6E-04
Mercury	6.91E-05	3.0E-04	1.0E+00	6.2E-03	5.2E-03	4.5E-03	3.9E-03	3.7E-03
Nickel	2.72E-02	1.10E-02	9.0E-02	6.0E-03	5.1E-03	4.4E-03	3.7E-03	3.6E-03
Selenium	3.26E-03	3.0E-04	1.0E-02	2.9E-03	2.5E-03	2.1E-03	1.8E-03	1.7E-03
Strontium	2.96E-01	6.0E-01	1.0E-02	1.3E-04	1.1E-04	9.6E-05	8.3E-05	7.9E-05
Tellurium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	1.92E-04	7.0E-05	1.0E-02	7.4E-04	6.2E-04	5.4E-04	4.6E-04	4.4E-04
Titanium	1.01E-01	3.0E+00	1.0E-02	9.1E-06	7.6E-06	6.5E-06	5.6E-06	5.4E-06
Uranium	5.00E-04	6.0E-04	1.0E-02	2.3E-04	1.9E-04	1.6E-04	1.4E-04	1.3E-04
Vanadium	1.37E-02	5.0E-03	1.0E-02	7.4E-04	6.3E-04	5.4E-04	4.6E-04	4.4E-04
Zinc	1.13E-01	5.0E-01	1.0E-01	6.1E-04	5.2E-04	4.4E-04	3.8E-04	3.6E-04

Table F20. Calculation of Carcinogenic Hazard from Direct Contact with Surface Water by the Recreational User – Baseline

Constituent	Surface Water (mg/L)	TRV	DAF	Cancer Risk				
				Infant	Toddler	Child	Teen	Adult
Recreational - Ingestion Surface Water								
Arsenic	8.45E-03	1.8E+00	N/A	2.0E-07	1.4E-06	2.0E-06	1.9E-06	1.9E-05
Recreational - Dermal Contact with Surface Water								
Arsenic	8.45E-03	1.8E+00	3.0E-02	1.8E-08	1.1E-07	1.9E-07	2.3E-07	1.7E-06

Table F21. Calculation of Carcinogenic Hazard from Direct Contact with Surface Water by the Recreational User - Predicted Future

Constituent	Surface Water (mg/L)	TRV	DAF	Cancer Risk				
				Infant	Toddler	Child	Teen	Adult
Recreational - Ingestion Surface Water								
Arsenic	9.79E-03	1.8E+00	N/A	2.3E-07	1.6E-06	2.3E-06	2.2E-06	2.2E-05
Recreational - Dermal Contact with Surface Water								
Arsenic	9.79E-03	1.8E+00	3.0E-02	2.1E-08	1.2E-07	2.2E-07	2.7E-07	2.0E-06

Table F22. Calculation of Non-Carcinogenic Hazard from Direct Contact with Surface Water by the Summer Resident – Baseline

Constituent	Surface Water (mg/L)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Summer Resident - Ingestion Surface Water								
Aluminum	5.89E+00	1.0E+00	N/A	1.1E-01	1.1E-01	7.2E-02	4.9E-02	6.2E-02
Antimony	2.05E-03	4.0E-04	N/A	9.4E-02	9.3E-02	6.2E-02	4.3E-02	5.4E-02
Arsenic	8.45E-03	1.0E-03	N/A	1.5E-01	1.5E-01	1.0E-01	7.1E-02	9.0E-02
Barium	1.13E-01	2.0E-01	N/A	1.0E-02	1.0E-02	6.9E-03	4.7E-03	6.0E-03
Bismuth	8.36E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	9.19E-02	2.0E-01	N/A	8.4E-03	8.4E-03	5.6E-03	3.8E-03	4.9E-03
Cadmium	4.83E-04	1.0E-03	N/A	8.8E-03	8.8E-03	5.9E-03	4.0E-03	5.1E-03
Chromium	6.68E-03	3.0E-03	N/A	4.1E-02	4.1E-02	2.7E-02	1.9E-02	2.4E-02
Cobalt	5.03E-03	1.4E-03	N/A	6.6E-02	6.5E-02	4.4E-02	3.0E-02	3.8E-02
Iron	9.17E+00	7.0E-01	N/A	2.4E-01	2.4E-01	1.6E-01	1.1E-01	1.4E-01
Lead	6.83E-03	3.6E-03	N/A	3.5E-02	3.5E-02	2.3E-02	1.6E-02	2.0E-02
Manganese	2.94E-01	0.156	N/A	3.4E-02	3.4E-02	2.3E-02	1.6E-02	2.0E-02
Mercury	1.21E-05	3.0E-04	N/A	7.4E-04	7.4E-04	4.9E-04	3.4E-04	4.3E-04
Nickel	2.06E-02	1.10E-02	N/A	3.4E-02	3.4E-02	2.3E-02	1.6E-02	2.0E-02
Selenium	2.30E-03	3.0E-04	N/A	1.4E-01	1.4E-01	9.3E-02	6.4E-02	8.1E-02
Strontium	2.69E-01	6.0E-01	N/A	8.2E-03	8.2E-03	5.5E-03	3.8E-03	4.8E-03
Tellurium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	1.84E-04	7.0E-05	N/A	4.8E-02	4.8E-02	3.2E-02	2.2E-02	2.8E-02
Titanium	9.82E-02	3.0E+00	N/A	6.0E-04	6.0E-04	4.0E-04	2.7E-04	3.5E-04
Uranium	5.00E-04	6.0E-04	N/A	1.5E-02	1.5E-02	1.0E-02	7.0E-03	8.8E-03
Vanadium	1.35E-02	5.0E-03	N/A	4.9E-02	4.9E-02	3.3E-02	2.3E-02	2.9E-02

Constituent	Surface Water (mg/L)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Zinc	5.81E-02	5.0E-01	N/A	2.1E-03	2.1E-03	1.4E-03	9.7E-04	1.2E-03
Summer Resident - Dermal Contact with Surface Water								
Aluminum	5.89E+00	1.0E+00	1.0E-02	3.1E-03	2.4E-03	1.9E-03	1.5E-03	1.4E-03
Antimony	2.05E-03	4.0E-04	1.0E-02	2.7E-03	2.1E-03	1.6E-03	1.3E-03	1.2E-03
Arsenic	8.45E-03	1.0E-03	3.0E-02	1.3E-02	1.0E-02	8.0E-03	6.4E-03	6.1E-03
Barium	1.13E-01	2.0E-01	1.0E-01	3.0E-03	2.3E-03	1.8E-03	1.4E-03	1.4E-03
Bismuth	8.36E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	9.19E-02	2.0E-01	1.0E-02	2.4E-04	1.8E-04	1.4E-04	1.2E-04	1.1E-04
Cadmium	4.83E-04	1.0E-03	1.0E-02	2.6E-04	1.9E-04	1.5E-04	1.2E-04	1.2E-04
Chromium	6.68E-03	3.0E-03	1.0E-02	1.2E-03	8.9E-04	7.0E-04	5.7E-04	5.3E-04
Cobalt	5.03E-03	1.4E-03	1.0E-02	1.9E-03	1.4E-03	1.1E-03	9.1E-04	8.6E-04
Iron	9.17E+00	7.0E-01	1.0E-02	6.9E-03	5.2E-03	4.1E-03	3.3E-03	3.1E-03
Lead	6.83E-03	3.6E-03	1.0E-02	1.0E-03	7.6E-04	6.0E-04	4.8E-04	4.6E-04
Manganese	2.94E-01	0.156	1.0E-02	1.0E-03	7.5E-04	5.9E-04	4.8E-04	4.5E-04
Mercury	1.21E-05	3.0E-04	1.0E+00	2.1E-03	1.6E-03	1.3E-03	1.0E-03	9.7E-04
Nickel	2.06E-02	1.10E-02	9.0E-02	8.9E-03	6.7E-03	5.3E-03	4.3E-03	4.0E-03
Selenium	2.30E-03	3.0E-04	1.0E-02	4.1E-03	3.1E-03	2.4E-03	1.9E-03	1.8E-03
Strontium	2.69E-01	6.0E-01	1.0E-02	2.4E-04	1.8E-04	1.4E-04	1.1E-04	1.1E-04
Tellurium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	1.84E-04	7.0E-05	1.0E-02	1.4E-03	1.1E-03	8.3E-04	6.7E-04	6.3E-04
Titanium	9.82E-02	3.0E+00	1.0E-02	1.7E-05	1.3E-05	1.0E-05	8.3E-06	7.8E-06
Uranium	5.00E-04	6.0E-04	1.0E-02	4.4E-04	3.3E-04	2.6E-04	2.1E-04	2.0E-04
Vanadium	1.35E-02	5.0E-03	1.0E-02	1.4E-03	1.1E-03	8.5E-04	6.8E-04	6.5E-04
Zinc	5.81E-02	5.0E-01	1.0E-01	6.2E-04	4.6E-04	3.7E-04	2.9E-04	2.8E-04

Table F23. Calculation of Non-Carcinogenic Hazard from Direct Contact with Surface Water by the Summer Resident - Predicted Future

Constituent	Surface Water (mg/L)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Summer Resident - Ingestion Surface Water								
Aluminum	6.15E+00	1.0E+00	N/A	1.1E-01	1.1E-01	7.5E-02	5.1E-02	6.5E-02
Antimony	5.74E-03	4.0E-04	N/A	2.6E-01	2.6E-01	1.7E-01	1.2E-01	1.5E-01
Arsenic	9.79E-03	1.0E-03	N/A	1.8E-01	1.8E-01	1.2E-01	8.2E-02	1.0E-01
Barium	1.19E-01	2.0E-01	N/A	1.1E-02	1.1E-02	7.2E-03	5.0E-03	6.3E-03
Bismuth	8.44E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	9.57E-02	2.0E-01	N/A	8.8E-03	8.7E-03	5.8E-03	4.0E-03	5.1E-03
Cadmium	1.33E-03	1.0E-03	N/A	2.4E-02	2.4E-02	1.6E-02	1.1E-02	1.4E-02
Chromium	7.62E-03	3.0E-03	N/A	4.6E-02	4.6E-02	3.1E-02	2.1E-02	2.7E-02
Cobalt	6.44E-03	1.4E-03	N/A	8.4E-02	8.4E-02	5.6E-02	3.9E-02	4.9E-02
Iron	9.66E+00	7.0E-01	N/A	2.5E-01	2.5E-01	1.7E-01	1.2E-01	1.5E-01
Lead	7.78E-03	3.6E-03	N/A	4.0E-02	3.9E-02	2.6E-02	1.8E-02	2.3E-02
Manganese	5.38E-01	0.156	N/A	6.3E-02	6.3E-02	4.2E-02	2.9E-02	3.7E-02
Mercury	6.91E-05	3.0E-04	N/A	4.2E-03	4.2E-03	2.8E-03	1.9E-03	2.4E-03
Nickel	2.72E-02	1.10E-02	N/A	4.5E-02	4.5E-02	3.0E-02	2.1E-02	2.6E-02
Selenium	3.26E-03	3.0E-04	N/A	2.0E-01	2.0E-01	1.3E-01	9.1E-02	1.2E-01
Strontium	2.96E-01	6.0E-01	N/A	9.0E-03	9.0E-03	6.0E-03	4.1E-03	5.2E-03
Tellurium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	1.92E-04	7.0E-05	N/A	5.0E-02	5.0E-02	3.3E-02	2.3E-02	2.9E-02
Titanium	1.01E-01	3.0E+00	N/A	6.1E-04	6.1E-04	4.1E-04	2.8E-04	3.6E-04
Uranium	5.00E-04	6.0E-04	N/A	1.5E-02	1.5E-02	1.0E-02	7.0E-03	8.8E-03
Vanadium	1.37E-02	5.0E-03	N/A	5.0E-02	5.0E-02	3.3E-02	2.3E-02	2.9E-02
Zinc	1.13E-01	5.0E-01	N/A	4.1E-03	4.1E-03	2.8E-03	1.9E-03	2.4E-03

Constituent	Surface Water (mg/L)	TRV	DAF	Hazard Quotient				
				Infant	Toddler	Child	Teen	Adult
Summer Resident - Dermal Contact with Surface Water								
Aluminum	6.15E+00	1.0E+00	1.0E-02	3.3E-03	2.5E-03	1.9E-03	1.6E-03	1.5E-03
Antimony	5.74E-03	4.0E-04	1.0E-02	7.6E-03	5.7E-03	4.5E-03	3.6E-03	3.4E-03
Arsenic	9.79E-03	1.0E-03	3.0E-02	1.6E-02	1.2E-02	9.2E-03	7.5E-03	7.0E-03
Barium	1.19E-01	2.0E-01	1.0E-01	3.1E-03	2.4E-03	1.9E-03	1.5E-03	1.4E-03
Bismuth	8.44E-03	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Boron	9.57E-02	2.0E-01	1.0E-02	2.5E-04	1.9E-04	1.5E-04	1.2E-04	1.1E-04
Cadmium	1.33E-03	1.0E-03	1.0E-02	7.1E-04	5.3E-04	4.2E-04	3.4E-04	3.2E-04
Chromium	7.62E-03	3.0E-03	1.0E-02	1.3E-03	1.0E-03	8.0E-04	6.4E-04	6.1E-04
Cobalt	6.44E-03	1.4E-03	1.0E-02	2.4E-03	1.8E-03	1.4E-03	1.2E-03	1.1E-03
Iron	9.66E+00	7.0E-01	1.0E-02	7.3E-03	5.5E-03	4.3E-03	3.5E-03	3.3E-03
Lead	7.78E-03	3.6E-03	1.0E-02	1.1E-03	8.6E-04	6.8E-04	5.5E-04	5.2E-04
Manganese	5.38E-01	0.156	1.0E-02	1.8E-03	1.4E-03	1.1E-03	8.7E-04	8.3E-04
Mercury	6.91E-05	3.0E-04	1.0E+00	1.2E-02	9.2E-03	7.2E-03	5.8E-03	5.5E-03
Nickel	2.72E-02	1.10E-02	9.0E-02	1.2E-02	8.9E-03	7.0E-03	5.7E-03	5.3E-03
Selenium	3.26E-03	3.0E-04	1.0E-02	5.8E-03	4.3E-03	3.4E-03	2.8E-03	2.6E-03
Strontium	2.96E-01	6.0E-01	1.0E-02	2.6E-04	2.0E-04	1.6E-04	1.3E-04	1.2E-04
Tellurium	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Thallium	1.92E-04	7.0E-05	1.0E-02	1.5E-03	1.1E-03	8.6E-04	7.0E-04	6.6E-04
Titanium	1.01E-01	3.0E+00	1.0E-02	1.8E-05	1.3E-05	1.1E-05	8.5E-06	8.0E-06
Uranium	5.00E-04	6.0E-04	1.0E-02	4.4E-04	3.3E-04	2.6E-04	2.1E-04	2.0E-04
Vanadium	1.37E-02	5.0E-03	1.0E-02	1.5E-03	1.1E-03	8.6E-04	7.0E-04	6.6E-04
Zinc	1.13E-01	5.0E-01	1.0E-01	1.2E-03	9.0E-04	7.1E-04	5.7E-04	5.4E-04

Table F24. Calculation of Carcinogenic Hazard from Direct Contact with Surface Water by the Summer Resident - Baseline

Constituent	Surface Water (mg/L)	TRV	DAF	Cancer Risk				
				Infant	Toddler	Child	Teen	Adult
Summer Resident - Ingestion Surface Water								
Arsenic	8.45E-03	1.8E+00	N/A	8.7E-07	6.1E-06	8.5E-06	8.3E-06	8.1E-05
Summer Resident - Dermal Contact with Surface Water								
Arsenic	8.45E-03	1.8E+00	3.0E-02	7.6E-08	4.0E-07	6.6E-07	7.6E-07	5.5E-06

Table F25. Calculation of Carcinogenic Hazard from Direct Contact with Surface Water by the Summer Resident - Predicted Future

Constituent	Surface Water (mg/L)	TRV	DAF	Cancer Risk				
				Infant	Toddler	Child	Teen	Adult
Summer Resident - Ingestion Surface Water								
Arsenic	8.45E-03	1.8E+00	N/A	1.0E-06	7.1E-06	9.9E-06	9.6E-06	9.3E-05
Summer Resident - Dermal Contact with Surface Water								
Arsenic	8.45E-03	1.8E+00	3.0E-02	8.8E-08	4.7E-07	7.7E-07	8.7E-07	6.3E-06

Attachment G
Detailed Risk Estimates for Sum of All Exposure Pathways

Table G1: Calculation of Non-Carcinogenic Hazard Index and Project Hazard for the Hunter/Trapper/Fisher Teen

Constituent	Baseline HI	Predicted Future HI	Project Hazard	Target Organ (Ingestion)	Target Organ (Inhalation)
Aluminum	1.59E-01	1.68E-01	9E-03	LUNG/ NEURO	NEURO
Antimony	3.88E-01	4.94E-01	1E-01	BLOOD	
Arsenic	3.39E-01	3.56E-01	2E-02	SKIN	LUNG
Barium	1.08E-01	2.38E-01	1E-01	KIDNEY	CARDIO
Bismuth	N/A	N/A	N/A		
Boron	3.05E-01	3.39E-01	3E-02	FETAL DEVELOPMENT	
Cadmium	1.79E+00	1.89E+00	1E-01	KIDNEY	
Chromium	1.01E-01	1.77E-01	8E-02	LIVER/ GASTRO	KIDNEY
Cobalt	4.74E-01	4.76E-01	1E-03	HEART/ LIVER	
Iron	5.57E-01	5.65E-01	8E-03	GASTRO/ HEART	
Lead	8.67E-02	8.98E-02	3E-03	NEURO	
Manganese	8.83E-01	9.07E-01	2E-02	NEURO	
Mercury	1.42E-01	5.39E-01	4E-01	KIDNEY	
Nickel	2.52E-01	4.05E-01	2E-01	SKIN/GASTRO	LUNG
Selenium	1.31E+00	1.35E+00	4E-02	SKIN	
Strontium	3.32E-02	1.40E-01	1E-01	MUSCULOSKELETAL	
Tellurium	N/A	N/A	N/A		
Thallium	7.34E-01	7.35E-01	1E-03	NEURO	
Titanium	1.28E-03	1.44E-03	2E-04	GASTRO	
Uranium	3.25E-02	3.25E-02	1E-05	KIDNEY	
Vanadium	1.14E-01	1.14E-01	8E-04	SKIN	
Zinc	4.99E-01	7.35E-01	2E-01	BLOOD	

Table G2: Calculation of Non-Carcinogenic Target Organ Hazard Index for the Hunter/Trapper/Fisher Teen

Target Organ (Ingestion)	Baseline HI	Predicted Future HI	Project Hazard
NEURO	1.12E+00	1.15E+00	3E-02
BLOOD	3.88E-01	4.94E-01	1E-01
SKIN	2.02E+00	2.22E+00	2E-01
CARDIO	1.03E+00	1.04E+00	9E-03
KIDNEY	2.03E+00	2.60E+00	6E-01
LIVER	5.76E-01	6.52E-01	8E-02
GASTRO	6.60E-01	7.43E-01	8E-02
FETAL DEVELOPMENT	3.05E-01	3.39E-01	3.37E-02
MUSCULOSKELETAL	3.32E-02	1.40E-01	1.06E-01
Target Organ (Inhalation)	**Baseline HI**	**Predicted Future HI**	**Project Hazard**
NEURO	1.02E-02	1.58E-02	5.62E-03
LUNG	1.30E-04	3.00E-04	1.70E-04
CARDIO	8.17E-04	1.26E-03	4.48E-04
KIDNEY	3.16E-06	4.87E-06	1.72E-06

Table G3: Calculation of Carcinogenic Incremental Lifetime Cancer Risk and Project Hazard for the Hunter/Trapper/Fisher Teen

Constituent	Baseline ILCR	Predicted Future ILCR	Project Hazard
Arsenic	1.80E-05	1.90E-05	1.03E-06
Cadmium	2.97E-09	9.14E-09	6.17E-09
Chromium	2.62E-07	9.14E-09	-2.53E-07
Nickel	2.06E-09	3.18E-09	1.12E-09

Table G4: Calculation of Non-Carcinogenic Hazard Index and Project Hazard for the Hunter/Trapper/Fisher Adult

Constituent	Baseline HI	Predicted Future HI	Project Hazard	Target Organ (Ingestion)	Target Organ (Inhalation)
Aluminum	1.97E-01	2.06E-01	8.83E-03	LUNG/ NEURO	NEURO
Antimony	5.00E-01	6.34E-01	1.33E-01	BLOOD	
Arsenic	3.53E-01	3.59E-01	5.84E-03	SKIN	LUNG
Barium	1.40E-01	2.31E-01	9.13E-02	KIDNEY	CARDIO
Bismuth	N/A	N/A	N/A		
Boron	3.97E-01	4.41E-01	4.39E-02	FETAL DEVELOPMENT	
Cadmium	2.33E+00	2.34E+00	1.23E-02	KIDNEY	
Chromium	1.27E-01	1.76E-01	4.93E-02	LIVER/ GASTRO	KIDNEY
Cobalt	6.14E-01	6.29E-01	1.46E-02	HEART/ LIVER	
Iron	7.10E-01	7.20E-01	1.03E-02	GASTRO/ HEART	
Lead	1.11E-01	1.15E-01	3.83E-03	NEURO	
Manganese	8.57E-01	8.86E-01	2.85E-02	NEURO	
Mercury	1.84E-01	6.98E-01	5.14E-01	KIDNEY	
Nickel	3.07E-01	3.98E-01	9.12E-02	SKIN/GASTRO	LUNG
Selenium	1.70E+00	1.75E+00	4.63E-02	SKIN	
Strontium	4.30E-02	1.36E-01	9.32E-02	MUSCULOSKELETAL	
Tellurium	N/A	N/A	N/A		
Thallium	9.54E-01	9.56E-01	1.60E-03	NEURO	
Titanium	1.57E-03	1.78E-03	2.06E-04	GASTRO	
Uranium	4.17E-02	4.17E-02	1.03E-05	KIDNEY	
Vanadium	1.46E-01	1.47E-01	9.16E-04	SKIN	
Zinc	6.49E-01	9.57E-01	3.08E-01	BLOOD	

Table G5: Calculation of Non-Carcinogenic Target Organ Hazard Index for the Hunter/Trapper/Fisher Adult

Target Organ (Ingestion)	Baseline HI	Predicted Future HI	Project Hazard
NEURO	1.16E+00	1.19E+00	3.61E-02
BLOOD	5.00E-01	6.34E-01	1.33E-01
SKIN	2.51E+00	2.66E+00	1.44E-01
CARDIO	1.32E+00	1.35E+00	2.48E-02
KIDNEY	2.64E+00	3.21E+00	5.76E-01
LIVER	7.41E-01	8.05E-01	6.39E-02
GASTRO	8.38E-01	8.98E-01	5.97E-02
FETAL DEVELOPMENT	3.97E-01	4.41E-01	4.39E-02
MUSCULOSKELETAL	4.30E-02	1.36E-01	9.32E-02
Target Organ (Inhalation)	**Baseline HI**	**Predicted Future HI**	**Project Hazard**
NEURO	9.15E-03	1.42E-02	5.05E-03
LUNG	1.17E-04	2.69E-04	1.52E-04
CARDIO	7.34E-04	1.14E-03	4.02E-04
KIDNEY	2.84E-06	4.38E-06	1.54E-06

Table G6: Calculation of Carcinogenic Incremental Lifetime Cancer Risk and Project Hazard for the Hunter/Trapper/Fisher Adult

Constituent	Baseline ILCR	Predicted Future ILCR	Project Hazard
Arsenic	9.70E-05	9.82E-05	1.19E-06
Cadmium	2.05E-08	6.30E-08	4.25E-08
Chromium	1.81E-06	6.30E-08	-1.74E-06
Nickel	1.42E-08	2.19E-08	7.69E-09

Table G7: Calculation of Non-Carcinogenic Hazard Index and Project Hazard for the Recreational User Infant

Constituent	Baseline HI	Predicted Future HI	Project Hazard	Target Organ (Ingestion)	Target Organ (Inhalation)
Aluminum	7.75E-02	8.21E-02	4.62E-03	LUNG/ NEURO	NEURO
Antimony	5.99E-02	1.47E-01	8.70E-02	BLOOD	
Arsenic	1.32E-01	1.46E-01	1.39E-02	SKIN	LUNG
Barium	8.46E-03	8.82E-03	3.55E-04	KIDNEY	CARDIO
Bismuth	N/A	N/A	N/A		
Boron	4.39E-03	4.57E-03	1.80E-04	FETAL DEVELOPMENT	
Cadmium	5.39E-03	1.34E-02	8.03E-03	KIDNEY	
Chromium	4.58E-02	4.91E-02	3.26E-03	LIVER/ GASTRO	KIDNEY
Cobalt	4.41E-02	5.36E-02	9.54E-03	HEART/ LIVER	
Iron	1.74E-01	1.81E-01	6.94E-03	GASTRO/ HEART	
Lead	2.53E-02	2.78E-02	2.54E-03	NEURO	
Manganese	2.14E-02	3.62E-02	1.47E-02	NEURO	
Mercury	2.09E-03	9.35E-03	7.25E-03	KIDNEY	
Nickel	2.54E-02	3.24E-02	7.04E-03	SKIN/GASTRO	LUNG
Selenium	8.19E-02	1.12E-01	3.02E-02	SKIN	
Strontium	4.32E-03	4.74E-03	4.24E-04	MUSCULOSKELETAL	
Tellurium	N/A	N/A	N/A		
Thallium	2.76E-02	2.87E-02	1.06E-03	NEURO	
Titanium	7.76E-04	7.87E-04	1.06E-05	GASTRO	
Uranium	9.07E-03	8.84E-03	-2.24E-04	KIDNEY	
Vanadium	2.69E-02	2.75E-02	5.63E-04	SKIN	
Zinc	1.95E-03	3.51E-03	1.56E-03	BLOOD	

Table G8: Calculation of Non-Carcinogenic Target Organ Hazard Index for the Recreational User Infant

Target Organ (Ingestion)	Baseline HI	Predicted Future HI	Project Hazard
NEURO	1.20E-01	1.40E-01	1.98E-02
BLOOD	5.99E-02	1.47E-01	8.70E-02
SKIN	2.66E-01	3.17E-01	5.16E-02
CARDIO	2.18E-01	2.35E-01	1.65E-02
KIDNEY	5.33E-02	7.19E-02	1.85E-02
LIVER	8.99E-02	1.03E-01	1.28E-02
GASTRO	2.21E-01	2.31E-01	1.02E-02
FETAL DEVELOPMENT	4.39E-03	4.57E-03	1.80E-04
MUSCULOSKELETAL	4.32E-03	4.74E-03	4.24E-04
Target Organ (Inhalation)	**Baseline HI**	**Predicted Future HI**	**Project Hazard**
NEURO	3.74E-03	5.81E-03	2.07E-03
LUNG	4.79E-05	1.10E-04	6.23E-05
CARDIO	1.50E-06	2.32E-06	8.23E-07
KIDNEY	1.16E-06	1.79E-06	6.31E-07

Table G9: Calculation of Carcinogenic Incremental Lifetime Cancer Risk and Project Hazard for the Recreational User Infant

Constituent	Baseline ILCR	Predicted Future ILCR	Project Hazard
Arsenic	3.44E-07	3.82E-07	3.82E-08
Cadmium	5.23E-11	1.61E-10	1.09E-10
Chromium	4.62E-09	7.13E-09	2.51E-09
Nickel	3.63E-11	5.59E-11	1.97E-11

Table G10: Calculation of Non-Carcinogenic Hazard Index and Project Hazard for the Recreational User Toddler

Constituent	Baseline HI	Predicted Future HI	Project Hazard	Target Organ (Ingestion)	Target Organ (Inhalation)
Aluminum	1.43E-01	1.50E-01	6.71E-03	LUNG/ NEURO	NEURO
Antimony	2.68E-01	3.54E-01	8.62E-02	BLOOD	
Arsenic	3.24E-01	3.39E-01	1.41E-02	SKIN	LUNG
Barium	7.36E-02	1.69E-01	9.50E-02	KIDNEY	CARDIO
Bismuth	N/A	N/A	N/A		
Boron	1.87E-01	2.07E-01	2.05E-02	FETAL DEVELOPMENT	
Cadmium	1.24E+00	1.32E+00	8.13E-02	KIDNEY	
Chromium	1.07E-01	1.55E-01	4.80E-02	LIVER/ GASTRO	KIDNEY
Cobalt	3.15E-01	3.56E-01	4.13E-02	HEART/ LIVER	
Iron	4.57E-01	4.64E-01	7.21E-03	GASTRO/ HEART	
Lead	6.99E-02	7.25E-02	2.56E-03	NEURO	
Manganese	6.26E-01	6.45E-01	1.89E-02	NEURO	
Mercury	8.69E-02	3.29E-01	2.42E-01	KIDNEY	
Nickel	1.84E-01	2.91E-01	1.08E-01	SKIN/GASTRO	LUNG
Selenium	8.33E-01	8.63E-01	3.00E-02	SKIN	
Strontium	2.14E-02	9.84E-02	7.70E-02	MUSCULOSKELETAL	
Tellurium	N/A	N/A	N/A		
Thallium	4.57E-01	4.58E-01	1.08E-03	NEURO	
Titanium	1.66E-03	1.80E-03	1.39E-04	GASTRO	
Uranium	2.38E-02	1.36E-02	-1.02E-02	KIDNEY	
Vanadium	7.74E-02	7.81E-02	6.07E-04	SKIN	
Zinc	3.04E-01	4.48E-01	1.44E-01	BLOOD	

Table G11: Calculation of Non-Carcinogenic Target Organ Hazard Index for the Recreational User Toddler

Target Organ (Ingestion)	Baseline HI	Predicted Future HI	Project Hazard
NEURO	8.32E-01	8.56E-01	2.41E-02
BLOOD	2.68E-01	3.54E-01	8.62E-02
SKIN	1.42E+00	1.57E+00	1.52E-01
CARDIO	7.71E-01	8.20E-01	4.85E-02
KIDNEY	1.44E+00	1.81E+00	3.71E-01
LIVER	4.21E-01	5.11E-01	8.93E-02
GASTRO	5.65E-01	6.21E-01	5.53E-02
FETAL DEVELOPMENT	1.87E-01	2.07E-01	2.05E-02
MUSCULOSKELETAL	2.14E-02	9.84E-02	7.70E-02
Target Organ (Inhalation)	**Baseline HI**	**Predicted Future HI**	**Project Hazard**
NEURO	7.35E-03	1.14E-02	4.06E-03
LUNG	9.40E-05	2.16E-04	1.22E-04
CARDIO	2.95E-06	4.56E-06	1.62E-06
KIDNEY	2.28E-06	3.52E-06	1.24E-06

Table G12: Calculation of Carcinogenic Incremental Lifetime Cancer Risk and Project Hazard for the Recreational User Toddler

Constituent	Baseline ILCR	Predicted Future ILCR	Project Hazard
Arsenic	1.08E-05	1.43E-05	3.48E-06
Cadmium	7.24E-10	2.23E-09	1.50E-09
Chromium	6.39E-08	9.87E-08	3.48E-08
Nickel	5.02E-10	7.74E-10	2.72E-10

Table G13: Calculation of Non-Carcinogenic Hazard Index and Project Hazard for the Recreational User Child

Constituent	Baseline HI	Predicted Future HI	Project Hazard	Target Organ (Ingestion)	Target Organ (Inhalation)
Aluminum	8.14E-02	8.66E-02	5.21E-03	LUNG/ NEURO	NEURO
Antimony	1.81E-01	2.38E-01	5.79E-02	BLOOD	
Arsenic	1.80E-01	1.89E-01	9.15E-03	SKIN	LUNG
Barium	5.21E-02	1.22E-01	6.97E-02	KIDNEY	CARDIO
Bismuth	N/A	N/A	N/A		
Boron	1.37E-01	1.53E-01	1.51E-02	FETAL DEVELOPMENT	
Cadmium	9.10E-01	9.69E-01	5.91E-02	KIDNEY	
Chromium	5.08E-02	8.55E-02	3.47E-02	LIVER/ GASTRO	KIDNEY
Cobalt	2.18E-01	2.46E-01	2.86E-02	HEART/ LIVER	
Iron	2.69E-01	2.73E-01	4.50E-03	GASTRO/ HEART	
Lead	4.16E-02	4.33E-02	1.67E-03	NEURO	
Manganese	4.54E-01	4.67E-01	1.30E-02	NEURO	
Mercury	6.40E-02	2.43E-01	1.79E-01	KIDNEY	
Nickel	1.30E-01	2.09E-01	7.88E-02	SKIN/GASTRO	LUNG
Selenium	5.98E-01	6.19E-01	2.01E-02	SKIN	
Strontium	1.54E-02	7.18E-02	5.64E-02	MUSCULOSKELETAL	
Tellurium	N/A	N/A	N/A		
Thallium	3.32E-01	3.33E-01	7.00E-04	NEURO	
Titanium	6.52E-04	7.48E-04	9.64E-05	GASTRO	
Uranium	1.56E-02	1.53E-02	-3.41E-04	KIDNEY	
Vanadium	5.41E-02	5.45E-02	4.30E-04	SKIN	
Zinc	2.24E-01	3.30E-01	1.06E-01	BLOOD	

Table G14: Calculation of Non-Carcinogenic Target Organ Hazard Index for the Recreational User Child

Target Organ (Ingestion)	Baseline HI	Predicted Future HI	Project Hazard
NEURO	5.70E-01	5.87E-01	1.63E-02
BLOOD	1.81E-01	2.38E-01	5.79E-02
SKIN	9.63E-01	1.07E+00	1.08E-01
CARDIO	4.86E-01	5.19E-01	3.31E-02
KIDNEY	1.02E+00	1.30E+00	2.73E-01
LIVER	2.68E-01	3.32E-01	6.33E-02
GASTRO	3.20E-01	3.59E-01	3.93E-02
FETAL DEVELOPMENT	1.37E-01	1.53E-01	1.51E-02
MUSCULOSKELETAL	1.54E-02	7.18E-02	5.64E-02
Target Organ (Inhalation)	**Baseline HI**	**Predicted Future HI**	**Project Hazard**
NEURO	6.44E-03	1.00E-02	3.56E-03
LUNG	8.24E-05	1.90E-04	1.07E-04
CARDIO	2.58E-06	4.00E-06	1.42E-06
KIDNEY	2.00E-06	3.08E-06	1.09E-06

Table G15: Calculation of Carcinogenic Incremental Lifetime Cancer Risk and Project Hazard for the Recreational User Child

Constituent	Baseline ILCR	Predicted Future ILCR	Project Hazard
Arsenic	1.61E-05	1.65E-05	4.07E-07
Cadmium	1.33E-09	4.08E-09	2.76E-09
Chromium	1.17E-07	1.81E-07	6.37E-08
Nickel	9.20E-10	1.42E-09	4.99E-10

Table G16: Calculation of Non-Carcinogenic Hazard Index and Project Hazard for the Recreational User Teen

Constituent	Baseline HI	Predicted Future HI	Project Hazard	Target Organ (Ingestion)	Target Organ (Inhalation)
Aluminum	5.78E-02	6.11E-02	3.25E-03	LUNG/ NEURO	NEURO
Antimony	1.36E-01	1.76E-01	4.02E-02	BLOOD	
Arsenic	1.22E-01	1.28E-01	6.41E-03	SKIN	LUNG
Barium	3.78E-02	8.24E-02	4.46E-02	KIDNEY	CARDIO
Bismuth	N/A	N/A	N/A		
Boron	1.06E-01	1.17E-01	1.17E-02	FETAL DEVELOPMENT	
Cadmium	6.19E-01	6.54E-01	3.54E-02	KIDNEY	
Chromium	3.70E-02	5.76E-02	2.06E-02	LIVER/ GASTRO	KIDNEY
Cobalt	1.66E-01	1.66E-01	8.26E-04	HEART/ LIVER	
Iron	1.98E-01	2.01E-01	3.11E-03	GASTRO/ HEART	
Lead	3.08E-02	3.20E-02	1.16E-03	NEURO	
Manganese	3.06E-01	3.15E-01	8.93E-03	NEURO	
Mercury	4.94E-02	1.88E-01	1.38E-01	KIDNEY	
Nickel	8.87E-02	1.42E-01	5.34E-02	SKIN/GASTRO	LUNG
Selenium	4.57E-01	4.71E-01	1.39E-02	SKIN	
Strontium	1.16E-02	4.85E-02	3.68E-02	MUSCULOSKELETAL	
Tellurium	N/A	N/A	N/A		
Thallium	2.55E-01	2.55E-01	4.84E-04	NEURO	
Titanium	4.62E-04	5.17E-04	5.55E-05	GASTRO	
Uranium	1.15E-02	1.13E-02	-1.37E-04	KIDNEY	
Vanadium	4.03E-02	4.06E-02	2.89E-04	SKIN	
Zinc	1.73E-01	2.55E-01	8.20E-02	BLOOD	

Table G17: Calculation of Non-Carcinogenic Target Organ Hazard Index for the Recreational User Teen

Target Organ (Ingestion)	Baseline HI	Predicted Future HI	Project Hazard
NEURO	3.91E-01	4.02E-01	1.12E-02
BLOOD	1.36E-01	1.76E-01	4.02E-02
SKIN	7.08E-01	7.82E-01	7.40E-02
CARDIO	3.64E-01	3.68E-01	3.92E-03
KIDNEY	7.05E-01	8.99E-01	1.94E-01
LIVER	2.03E-01	2.24E-01	2.14E-02
GASTRO	2.36E-01	2.59E-01	2.38E-02
FETAL DEVELOPMENT	1.06E-01	1.17E-01	1.17E-02
MUSCULOSKELETAL	1.16E-02	4.85E-02	3.68E-02
Target Organ (Inhalation)	**Baseline HI**	**Predicted Future HI**	**Project Hazard**
NEURO	3.82E-03	5.93E-03	2.11E-03
LUNG	4.88E-05	1.12E-04	6.36E-05
CARDIO	1.53E-06	2.37E-06	8.40E-07
KIDNEY	1.18E-06	1.83E-06	6.44E-07

Table G18: Calculation of Carcinogenic Incremental Lifetime Cancer Risk and Project Hazard for the Recreational User Teen

Constituent	Baseline ILCR	Predicted Future ILCR	Project Hazard
Arsenic	6.48E-06	6.88E-06	3.95E-07
Cadmium	1.11E-09	3.43E-09	2.32E-09
Chromium	9.84E-08	1.52E-07	5.35E-08
Nickel	7.72E-10	1.19E-09	4.19E-10

Table G19: Calculation of Non-Carcinogenic Hazard Index and Project Hazard for the Recreational User Adult

Constituent	Baseline HI	Predicted Future HI	Project Hazard	Target Organ (Ingestion)	Target Organ (Inhalation)
Aluminum	7.14E-02	7.47E-02	3.32E-03	LUNG/ NEURO	NEURO
Antimony	1.76E-01	2.26E-01	5.04E-02	BLOOD	
Arsenic	1.28E-01	1.35E-01	7.86E-03	SKIN	LUNG
Barium	4.87E-02	4.89E-02	2.03E-04	KIDNEY	CARDIO
Bismuth	N/A	N/A	N/A		
Boron	1.38E-01	1.38E-01	1.04E-04	FETAL DEVELOPMENT	
Cadmium	8.06E-01	8.11E-01	4.66E-03	KIDNEY	
Chromium	4.58E-02	4.76E-02	1.83E-03	LIVER/ GASTRO	KIDNEY
Cobalt	2.14E-01	2.20E-01	5.51E-03	HEART/ LIVER	
Iron	2.52E-01	2.56E-01	3.88E-03	GASTRO/ HEART	
Lead	3.93E-02	4.07E-02	1.45E-03	NEURO	
Manganese	2.98E-01	3.06E-01	8.53E-03	NEURO	
Mercury	6.41E-02	6.82E-02	4.19E-03	KIDNEY	
Nickel	1.08E-01	1.12E-01	4.09E-03	SKIN/GASTRO	LUNG
Selenium	5.94E-01	6.11E-01	1.75E-02	SKIN	
Strontium	1.51E-02	1.76E-02	2.51E-03	MUSCULOSKELETAL	
Tellurium	N/A	N/A	N/A		
Thallium	3.31E-01	3.32E-01	6.04E-04	NEURO	
Titanium	5.64E-04	5.69E-04	4.91E-06	GASTRO	
Uranium	1.47E-02	1.46E-02	-1.32E-04	KIDNEY	
Vanadium	5.18E-02	5.22E-02	3.44E-04	SKIN	
Zinc	2.25E-01	2.26E-01	9.89E-04	BLOOD	

Table G20: Calculation of Non-Carcinogenic Target Organ Hazard Index for the Recreational User Adult

Target Organ (Ingestion)	Baseline HI	Predicted Future HI	Project Hazard
NEURO	4.05E-01	4.16E-01	1.14E-02
BLOOD	1.76E-01	2.26E-01	5.04E-02
SKIN	8.81E-01	9.11E-01	2.97E-02
CARDIO	4.67E-01	4.76E-01	9.37E-03
KIDNEY	9.16E-01	9.27E-01	1.07E-02
LIVER	2.60E-01	2.67E-01	7.33E-03
GASTRO	2.99E-01	3.04E-01	5.70E-03
FETAL DEVELOPMENT	1.38E-01	1.38E-01	1.04E-04
MUSCULOSKELETAL	1.51E-02	1.76E-02	2.51E-03
Target Organ (Inhalation)	**Baseline HI**	**Predicted Future HI**	**Project Hazard**
NEURO	3.43E-03	5.33E-03	1.89E-03
LUNG	4.39E-05	1.01E-04	5.72E-05
CARDIO	1.38E-06	2.13E-06	7.55E-07
KIDNEY	1.06E-06	1.64E-06	5.78E-07

Table G21: Calculation of Carcinogenic Incremental Lifetime Cancer Risk and Project Hazard for the Recreational User Adult

Constituent	Baseline ILCR	Predicted Future ILCR	Project Hazard
Arsenic	3.58E-05	3.65E-05	7.52E-07
Cadmium	7.67E-09	2.36E-08	1.60E-08
Chromium	6.78E-07	1.05E-06	3.68E-07
Nickel	5.32E-09	8.20E-09	2.88E-09

Table G22: Calculation of Non-Carcinogenic Hazard Index and Project Hazard for the Summer Resident Infant

Constituent	Baseline HI	Predicted Future HI	Project Hazard	Target Organ (Ingestion)	Target Organ (Inhalation)
Aluminum	1.54E-01	1.64E-01	9.93E-03	LUNG/ NEURO	NEURO
Antimony	1.20E-01	2.89E-01	1.69E-01	BLOOD	
Arsenic	2.63E-01	2.89E-01	2.56E-02	SKIN	LUNG
Barium	1.69E-02	1.74E-02	5.54E-04	KIDNEY	CARDIO
Bismuth	N/A	N/A	N/A		
Boron	8.77E-03	9.12E-03	3.50E-04	FETAL DEVELOPMENT	
Cadmium	1.08E-02	2.64E-02	1.56E-02	KIDNEY	
Chromium	8.72E-02	9.32E-02	6.01E-03	LIVER/ GASTRO	KIDNEY
Cobalt	8.82E-02	1.07E-01	1.85E-02	HEART/ LIVER	
Iron	3.48E-01	3.62E-01	1.35E-02	GASTRO/ HEART	
Lead	5.05E-02	5.55E-02	4.93E-03	NEURO	
Manganese	4.29E-02	7.15E-02	2.86E-02	NEURO	
Mercury	4.13E-03	8.35E-03	4.21E-03	KIDNEY	
Nickel	5.06E-02	6.17E-02	1.11E-02	SKIN/GASTRO	LUNG
Selenium	1.64E-01	2.22E-01	5.87E-02	SKIN	
Strontium	8.64E-03	9.46E-03	8.24E-04	MUSCULOSKELETAL	
Tellurium	N/A	N/A	N/A		
Thallium	5.52E-02	5.73E-02	2.05E-03	NEURO	
Titanium	1.55E-03	1.57E-03	2.08E-05	GASTRO	
Uranium	1.57E-02	1.82E-02	2.41E-03	KIDNEY	
Vanadium	7.86E-02	7.99E-02	1.28E-03	SKIN	
Zinc	3.89E-03	6.41E-03	2.52E-03	BLOOD	

Table G23: Calculation of Non-Carcinogenic Target Organ Hazard Index for the Summer Resident Infant

Target Organ (Ingestion)	Baseline HI	Predicted Future HI	Project Hazard
NEURO	2.40E-01	2.79E-01	3.93E-02
BLOOD	1.20E-01	2.89E-01	1.69E-01
SKIN	5.56E-01	6.52E-01	9.64E-02
CARDIO	4.36E-01	4.68E-01	3.20E-02
KIDNEY	1.02E-01	1.28E-01	2.58E-02
LIVER	1.75E-01	2.00E-01	2.45E-02
GASTRO	4.37E-01	4.56E-01	1.95E-02
FETAL DEVELOPMENT	8.77E-03	9.12E-03	3.50E-04
MUSCULOSKELETAL	8.64E-03	9.46E-03	8.24E-04
Target Organ (Inhalation)	**Baseline HI**	**Predicted Future HI**	**Project Hazard**
NEURO	7.49E-03	1.16E-02	4.13E-03
LUNG	9.57E-05	2.20E-04	1.25E-04
CARDIO	3.00E-06	4.65E-06	1.65E-06
KIDNEY	2.32E-06	3.58E-06	1.26E-06

Table G24: Calculation of Carcinogenic Incremental Lifetime Cancer Risk and Project Hazard for the Summer Resident Infant

Constituent	Baseline ILCR	Predicted Future ILCR	Project Hazard
Arsenic	1.49E-06	1.65E-06	1.65E-07
Cadmium	2.27E-10	6.98E-10	4.71E-10
Chromium	2.00E-08	3.09E-08	1.09E-08
Nickel	1.57E-10	2.42E-10	8.52E-11

Table G25: Calculation of Non-Carcinogenic Hazard Index and Project Hazard for the Summer Resident Toddler

Constituent	Baseline HI	Predicted Future HI	Project Hazard	Target Organ (Ingestion)	Target Organ (Inhalation)
Aluminum	2.93E-01	3.07E-01	1.38E-02	LUNG/ NEURO	NEURO
Antimony	5.68E-01	7.36E-01	1.68E-01	BLOOD	
Arsenic	6.72E-01	6.99E-01	2.64E-02	SKIN	LUNG
Barium	1.57E-01	3.63E-01	2.06E-01	KIDNEY	CARDIO
Bismuth	N/A	N/A	N/A		
Boron	4.04E-01	4.49E-01	4.45E-02	FETAL DEVELOPMENT	
Cadmium	2.69E+00	2.87E+00	1.74E-01	KIDNEY	
Chromium	2.17E-01	3.20E-01	1.03E-01	LIVER/ GASTRO	KIDNEY
Cobalt	6.72E-01	7.60E-01	8.75E-02	HEART/ LIVER	
Iron	9.52E-01	9.66E-01	1.41E-02	GASTRO/ HEART	
Lead	1.46E-01	1.51E-01	5.01E-03	NEURO	
Manganese	1.35E+00	1.39E+00	3.78E-02	NEURO	
Mercury	1.88E-01	7.03E-01	5.15E-01	KIDNEY	
Nickel	3.39E-01	5.57E-01	2.19E-01	SKIN/GASTRO	LUNG
Selenium	1.79E+00	1.85E+00	5.85E-02	SKIN	
Strontium	4.56E-02	2.12E-01	1.67E-01	MUSCULOSKELETAL	
Tellurium	N/A	N/A	N/A		
Thallium	9.86E-01	9.88E-01	2.10E-03	NEURO	
Titanium	3.40E-03	3.69E-03	2.99E-04	GASTRO	
Uranium	4.51E-02	3.10E-02	-1.41E-02	KIDNEY	
Vanadium	2.12E-01	2.14E-01	1.56E-03	SKIN	
Zinc	6.59E-01	9.70E-01	3.12E-01	BLOOD	

Table G26: Calculation of Non-Carcinogenic Target Organ Hazard Index for the Summer Resident Toddler

Target Organ (Ingestion)	Baseline HI	Predicted Future HI	Project Hazard
NEURO	1.50E+00	1.54E+00	4.28E-02
BLOOD	5.68E-01	7.36E-01	1.68E-01
SKIN	3.01E+00	3.32E+00	3.05E-01
CARDIO	1.62E+00	1.73E+00	1.02E-01
KIDNEY	3.10E+00	3.89E+00	7.92E-01
LIVER	8.89E-01	1.08E+00	1.90E-01
GASTRO	1.17E+00	1.29E+00	1.17E-01
FETAL DEVELOPMENT	4.04E-01	4.49E-01	4.45E-02
MUSCULOSKELETAL	4.56E-02	2.12E-01	1.67E-01
Target Organ (Inhalation)	**Baseline HI**	**Predicted Future HI**	**Project Hazard**
NEURO	1.47E-02	2.28E-02	8.12E-03
LUNG	1.83E-04	4.26E-04	2.42E-04
CARDIO	5.90E-06	9.13E-06	3.23E-06
KIDNEY	4.56E-06	7.04E-06	2.48E-06

Table G27: Calculation of Carcinogenic Incremental Lifetime Cancer Risk and Project Hazard for the Summer Resident Toddler

Constituent	Baseline ILCR	Predicted Future ILCR	Project Hazard
Arsenic	4.69E-05	4.81E-05	1.24E-06
Cadmium	3.14E-09	9.66E-09	6.52E-09
Chromium	2.77E-07	4.28E-07	1.51E-07
Nickel	2.17E-09	3.35E-09	1.18E-09

Table G28: Calculation of Non-Carcinogenic Hazard Index and Project Hazard for the Summer Resident Child

Constituent	Baseline HI	Predicted Future HI	Project Hazard	Target Organ (Ingestion)	Target Organ (Inhalation)
Aluminum	1.67E-01	1.78E-01	1.08E-02	LUNG/ NEURO	NEURO
Antimony	3.85E-01	4.97E-01	1.12E-01	BLOOD	
Arsenic	3.77E-01	3.93E-01	1.67E-02	SKIN	LUNG
Barium	1.12E-01	2.62E-01	1.51E-01	KIDNEY	CARDIO
Bismuth	N/A	N/A	N/A		
Boron	2.97E-01	3.30E-01	3.28E-02	FETAL DEVELOPMENT	
Cadmium	1.97E+00	2.10E+00	1.27E-01	KIDNEY	
Chromium	1.03E-01	1.78E-01	7.45E-02	LIVER/ GASTRO	KIDNEY
Cobalt	4.67E-01	5.28E-01	6.06E-02	HEART/ LIVER	
Iron	5.65E-01	5.74E-01	8.72E-03	GASTRO/ HEART	
Lead	8.78E-02	9.10E-02	3.24E-03	NEURO	
Manganese	9.81E-01	1.01E+00	2.58E-02	NEURO	
Mercury	1.38E-01	5.18E-01	3.79E-01	KIDNEY	
Nickel	2.48E-01	4.09E-01	1.60E-01	SKIN/GASTRO	LUNG
Selenium	1.29E+00	1.33E+00	3.89E-02	SKIN	
Strontium	3.29E-02	1.55E-01	1.22E-01	MUSCULOSKELETAL	
Tellurium	N/A	N/A	N/A		
Thallium	7.17E-01	7.18E-01	1.36E-03	NEURO	
Titanium	1.35E-03	1.56E-03	2.07E-04	GASTRO	
Uranium	3.22E-02	3.28E-02	6.08E-04	KIDNEY	
Vanadium	1.20E-01	1.21E-01	8.85E-04	SKIN	
Zinc	4.85E-01	7.15E-01	2.30E-01	BLOOD	

Table G29: Calculation of Non-Carcinogenic Target Organ Hazard Index for the Summer Resident Child

Target Organ (Ingestion)	Baseline HI	Predicted Future HI	Project Hazard
NEURO	1.22E+00	1.26E+00	3.27E-02
BLOOD	3.85E-01	4.97E-01	1.12E-01
SKIN	2.03E+00	2.25E+00	2.17E-01
CARDIO	1.03E+00	1.10E+00	6.93E-02
KIDNEY	2.21E+00	2.79E+00	5.81E-01
LIVER	5.70E-01	7.05E-01	1.35E-01
GASTRO	6.70E-01	7.53E-01	8.34E-02
FETAL DEVELOPMENT	2.97E-01	3.30E-01	3.28E-02
MUSCULOSKELETAL	3.29E-02	1.55E-01	1.22E-01
Target Organ (Inhalation)	**Baseline HI**	**Predicted Future HI**	**Project Hazard**
NEURO	1.29E-02	2.00E-02	7.11E-03
LUNG	1.61E-04	3.73E-04	2.12E-04
CARDIO	5.16E-06	8.00E-06	2.83E-06
KIDNEY	3.99E-06	6.17E-06	2.17E-06

Table G30: Calculation of Carcinogenic Incremental Lifetime Cancer Risk and Project Hazard for the Summer Resident Child

Constituent	Baseline ILCR	Predicted Future ILCR	Project Hazard
Arsenic	6.78E-05	7.13E-05	3.56E-06
Cadmium	5.75E-09	1.77E-08	1.20E-08
Chromium	5.08E-07	7.84E-07	2.76E-07
Nickel	3.98E-09	6.15E-09	2.16E-09

Table G31: Calculation of Non-Carcinogenic Hazard Index and Project Hazard for the Summer Resident Teen

Constituent	Baseline HI	Predicted Future HI	Project Hazard	Target Organ (Ingestion)	Target Organ (Inhalation)
Aluminum	1.19E-01	1.26E-01	6.79E-03	LUNG/ NEURO	NEURO
Antimony	2.91E-01	3.68E-01	7.73E-02	BLOOD	
Arsenic	2.54E-01	2.66E-01	1.15E-02	SKIN	LUNG
Barium	8.08E-02	1.77E-01	9.66E-02	KIDNEY	CARDIO
Bismuth	N/A	N/A	N/A		
Boron	2.29E-01	2.54E-01	2.53E-02	FETAL DEVELOPMENT	
Cadmium	1.34E+00	1.42E+00	7.58E-02	KIDNEY	
Chromium	7.51E-02	1.19E-01	4.41E-02	LIVER/ GASTRO	KIDNEY
Cobalt	3.56E-01	3.56E-01	7.21E-04	HEART/ LIVER	
Iron	4.18E-01	4.24E-01	5.98E-03	GASTRO/ HEART	
Lead	6.51E-02	6.73E-02	2.23E-03	NEURO	
Manganese	6.62E-01	6.80E-01	1.77E-02	NEURO	
Mercury	1.07E-01	3.99E-01	2.93E-01	KIDNEY	
Nickel	1.89E-01	3.02E-01	1.13E-01	SKIN/GASTRO	LUNG
Selenium	9.85E-01	1.01E+00	2.68E-02	SKIN	
Strontium	2.49E-02	1.05E-01	7.98E-02	MUSCULOSKELETAL	
Tellurium	N/A	N/A	N/A		
Thallium	5.50E-01	5.51E-01	9.32E-04	NEURO	
Titanium	9.63E-04	1.08E-03	1.19E-04	GASTRO	
Uranium	2.40E-02	2.44E-02	3.35E-04	KIDNEY	
Vanadium	8.86E-02	8.91E-02	5.86E-04	SKIN	
Zinc	3.74E-01	5.51E-01	1.77E-01	BLOOD	

Table G32: Calculation of Non-Carcinogenic Target Organ Hazard Index for the Summer Resident Teen

Target Organ (Ingestion)	Baseline HI	Predicted Future HI	Project Hazard
NEURO	8.38E-01	8.61E-01	2.2E-02
BLOOD	2.91E-01	3.68E-01	7.7E-02
SKIN	1.52E+00	1.67E+00	1.5E-01
CARDIO	7.73E-01	7.80E-01	6.7E-03
KIDNEY	1.52E+00	1.93E+00	4.1E-01
LIVER	4.31E-01	4.76E-01	4.5E-02
GASTRO	4.94E-01	5.44E-01	5.0E-02
FETAL DEVELOPMENT	2.29E-01	2.54E-01	2.53E-02
MUSCULOSKELETAL	2.49E-02	1.05E-01	7.98E-02
Target Organ (Inhalation)	**Baseline HI**	**Predicted Future HI**	**Project Hazard**
NEURO	7.64E-03	1.19E-02	4.2E-03
LUNG	9.77E-05	2.25E-04	1.3E-04
CARDIO	3.06E-06	4.74E-06	1.7E-06
KIDNEY	2.37E-06	3.66E-06	1.3E-06

Table G33: Calculation of Carcinogenic Incremental Lifetime Cancer Risk and Project Hazard for the Summer Resident Teen

Constituent	Baseline ILCR	Predicted Future ILCR	Project Hazard
Arsenic	2.78E-05	2.95E-05	1.7E-06
Cadmium	4.83E-09	1.49E-08	1.0E-08
Chromium	4.26E-07	6.58E-07	2.3E-07
Nickel	3.35E-09	5.16E-09	1.8E-09

Table G34: Calculation of Non-Carcinogenic Hazard Index and Project Hazard for the Summer Resident Adult

Constituent	Baseline HI	Predicted Future HI	Project Hazard	Target Organ (Ingestion)	Target Organ (Inhalation)
Aluminum	1.47E-01	1.54E-01	6.91E-03	LUNG/ NEURO	NEURO
Antimony	3.75E-01	4.73E-01	9.79E-02	BLOOD	
Arsenic	2.65E-01	2.68E-01	3.42E-03	SKIN	LUNG
Barium	1.04E-01	1.72E-01	6.81E-02	KIDNEY	CARDIO
Bismuth	N/A	N/A	N/A		
Boron	2.98E-01	3.31E-01	3.29E-02	FETAL DEVELOPMENT	
Cadmium	1.75E+00	1.75E+00	9.04E-03	KIDNEY	
Chromium	9.41E-02	1.21E-01	2.66E-02	LIVER/ GASTRO	KIDNEY
Cobalt	4.61E-01	4.71E-01	1.07E-02	HEART/ LIVER	
Iron	5.32E-01	5.40E-01	7.53E-03	GASTRO/ HEART	
Lead	8.30E-02	8.59E-02	2.81E-03	NEURO	
Manganese	6.43E-01	6.64E-01	2.10E-02	NEURO	
Mercury	1.38E-01	5.19E-01	3.81E-01	KIDNEY	
Nickel	2.30E-01	2.98E-01	6.71E-02	SKIN/GASTRO	LUNG
Selenium	1.28E+00	1.31E+00	3.40E-02	SKIN	
Strontium	3.23E-02	1.02E-01	6.99E-02	MUSCULOSKELETAL	
Tellurium	N/A	N/A	N/A		
Thallium	7.16E-01	7.17E-01	1.17E-03	NEURO	
Titanium	1.18E-03	1.33E-03	1.54E-04	GASTRO	
Uranium	3.10E-02	3.12E-02	2.84E-04	KIDNEY	
Vanadium	1.12E-01	1.13E-01	6.92E-04	SKIN	
Zinc	4.87E-01	7.17E-01	2.31E-01	BLOOD	

Table G35: Calculation of Non-Carcinogenic Target Organ Hazard Index for the Summer Resident Adult

Target Organ (Ingestion)	Baseline HI	Predicted Future HI	Project Hazard
NEURO	8.66E-01	8.93E-01	2.69E-02
BLOOD	3.75E-01	4.73E-01	9.79E-02
SKIN	1.89E+00	1.99E+00	1.05E-01
CARDIO	9.93E-01	1.01E+00	1.82E-02
KIDNEY	1.98E+00	2.39E+00	4.17E-01
LIVER	5.55E-01	5.92E-01	3.73E-02
GASTRO	6.28E-01	6.62E-01	3.42E-02
FETAL DEVELOPMENT	2.98E-01	3.31E-01	3.29E-02
MUSCULOSKELETAL	3.23E-02	1.02E-01	6.99E-02
Target Organ (Inhalation)	**Baseline HI**	**Predicted Future HI**	**Project Hazard**
NEURO	6.87E-03	1.07E-02	3.79E-03
LUNG	8.78E-05	2.02E-04	1.14E-04
CARDIO	2.75E-06	4.26E-06	1.51E-06
KIDNEY	2.13E-06	3.28E-06	1.16E-06

Table G36: Calculation of Carcinogenic Incremental Lifetime Cancer Risk and Project Hazard for the Summer Resident Adult

Constituent	Baseline ILCR	Predicted Future ILCR	Project Hazard
Arsenic	1.53E-04	1.56E-04	2.96E-06
Cadmium	3.32E-08	1.02E-07	6.91E-08
Chromium	2.94E-06	4.53E-06	1.60E-06
Nickel	2.30E-08	3.55E-08	1.25E-08

Attachment H
Calculations

EXPOSURE ASSESSMENT

This section provides worked calculations for each of the models used to estimate arsenic exposure from soil and country food for the adult hunter, trapper, fisher receptor.

Ingestion of Soil

The predicted intake of each constituent via ingestion of soil was calculated as:

$$\text{Dose (mg/kg-day)} = \frac{C_S \times IR_S \times RAF_{Oral} \times D_2 \times D_3 (\times D_4)}{BW (\times LE)}$$

Where:

Dose = predicted chronic daily intake (mg/kg-day)
C_S = concentration of contaminant in soil (arsenic 95th percentile = 72.9 mg/kg)
IR_S = receptor ingestion rate for soil (0.00002 kg/d)
RAF_{Oral} = relative absorption factor from the gastrointestinal tract (1.0) (unit-less)
D_2 = days per week exposed (7 days/7-day week)
D_3 = weeks per year exposed (8 weeks per 12-week for assessment of non-carcinogens)
D_3 = weeks per year exposed (8 weeks per 52-week for assessment of carcinogens)
D_4 = total years exposed to site (60 years) (for assessment of carcinogens only)
BW = body weight (70.7 kg)
LE = life expectancy (60 years) (for assessment of carcinogens only)

$$Dose_{non-carcinogen} = \frac{(72.9 mg/kg \times 0.00002 kg/d \times 1.0 \times \frac{7d}{7d} \times \frac{8w}{12w})}{(70.7 kg)}$$

$$Dose_{non-carcinogen} = 1.375 \times 10^{-5}\ mg/kg - day$$

$$Dose_{carcinogen} = \frac{(72.9 mg/kg \times 0.00002 kg/d \times 1.0 \times \frac{7d}{7d} \times \frac{8w}{52w} \times \frac{60y}{60y})}{(70.7 kg)}$$

$$Dose_{carcinogen} = 3.17 \times 10^{-6}\ mg/kg - day$$

Inhalation of Soil Particulate (Fugitive Dust)

The predicted intake of each constituent via inhalation of soil particulate was calculated as:

$$\text{Dose (mg/kg-day)} = \frac{C_S \times P_{Air} \times IR_A \times RAF_{Inh} \times D_1 \times D_2 \times D_3 (\times D_4)}{BW (\times LE)}$$

Where:

Dose = predicted chronic daily intake (mg/kg-day)

C_S = concentration of contaminant in soil (not used – see note below)

P_{Air} = particulate (fugitive dust) concentration in air (not used – see note below)

Note: Rather than extrapolating air particulate concentrations from soil concentrations (C_s) using a generic particulate concentration (P_{Air}), site-specific modelled air particulate concentrations were used. Specifically, the total annual particulate matter (PM_{Total}) values were used as air particulate concentrations, replacing the C_S and P_{Air} terms in the above equation.

PM_{Total} = concentrations of air particulate (dust) (arsenic = 7.29×10^{-7} mg/m^3).

IR_A = receptor inhalation rate for fugitive dust (0.69 m^3/hour = 16.6 m^3/day)

RAF_{Inh} = relative absorption factor from the respiratory tract (1.0)(unit-less)

D_1 = hours per day exposed (24 hours/24-hour day)

D_2 = days per week exposed (7 days/7-day week)

D_3 = weeks per year exposed (8 weeks per 12-week for assessment of non-carcinogens)

D_3 = weeks per year exposed (8 weeks per 52-week for assessment of carcinogens)

D_4 = total years exposed to Site (60 years) (for assessment of carcinogens only)

BW = body weight (70.7 kg)

LE = life expectancy (60 years) (for assessment of carcinogens only)

$$Dose_{non-carcinogen} = \frac{(7.29 \times 10^{-7}\ mg/m^3 \times 16.6 m^3/day \times 1.0 \times \frac{24h}{24h} \times \frac{7d}{7d} \times \frac{8w}{12w})}{(70.7kg)}$$

$$Dose_{non-carcinogen} = 1.14 \times 10^{-7}\ mg/kg - day$$

$$Dose_{carcinogen} = \frac{(7.29 \times 10^{-7}\ mg/m^3 \times 16.6 m^3/day \times 1.0 \times \frac{24h}{24h} \times \frac{7d}{7d} \times \frac{8w}{52w} \times \frac{60y}{60y})}{(70.7kg)}$$

$$Dose_{carcinogen} = 2.63 \times 10^{-8}\ mg/kg - day$$

Dermal Contact with Soil

The predicted intake of each constituent via dermal contact with soil was calculate as:

$$\text{Dose (mg/kg-day)} = \frac{((C_S \times SA_H \times SL_H) + (C_S \times SA_O \times SL_O)) \times RAF_{Derm} \times D_2 \times D_3 (\times D_4)}{BW (\times LE)}$$

Where:

Dose = predicted chronic daily intake (mg/kg-day)
CS = concentration of contaminant in soil (arsenic 95th percentile = 72.9 mg/kg)
S_{AH} = surface area of hands exposed for soil loading (890 cm^2)
S_{LH} = soil loading rate to exposed skin of hands (1x10^{-7} kg/cm^2-event)
S_{AO} = surface area exposed other than hands for soil loading (8220 cm^2)
S_{LO} = soil loading rate to exposed skin other than hands (1x10^{-8} kg/cm^2-event)
RAF_{Derm} = relative absorption factor from the gastrointestinal tract (1.0)(unit-less)
D_2 = days per week exposed (7 days/7-day week)
D_3 = weeks per year exposed (8 weeks per 12-week for assessment of non-carcinogens)
D_3 = weeks per year exposed (8 weeks per 52-week for assessment of carcinogens)
D_4 = total years exposed to Site (60 years) (for assessment of carcinogens only)
BW = body weight (70.7 kg)
LE = life expectancy (60 years) (for assessment of carcinogens only)

$$Dose_{non-carcinogen}$$

$$= \frac{(72.9 mg/kg \times (890 cm^2 \times 1 \times 10^{-7} \frac{kg}{cm^2} - event + 8220 cm^2 \times 1 \times 10^{-8} \frac{kg}{cm^2} - event \times 1.0 \times \frac{7d}{7d} \times \frac{8w}{12w})}{(70.7 kg)}$$

$$Dose_{non-carcinogen} = 1.2 \times 10^{-4}\ mg/kg - day$$

$$Dose_{carcinogen}$$

$$= \frac{(72.9 mg/kg \times (890 cm^2 \times 1 \times 10^{-7} \frac{kg}{cm^2} - event + 8220 cm^2 \times 1 \times 10^{-8} \frac{kg}{cm^2} - event \times 1.0 \times \frac{7d}{7d} \times \frac{8w}{12w} \times \frac{60y}{60y})}{(70.7 kg)}$$

$$Dose_{carcinogen} = 2.7 \times 10^{-5}\ mg/kg - day$$

Ingestion of Country Foods

The predicted intake of each constituent via ingestion of soil was calculated as:

$$\text{Dose (mg/kg} - \text{day)} = \frac{\text{C}_\text{F} \times \text{IR}_\text{F} \times \text{RAF}_\text{Oral} \times \text{D}_2 \times \text{D}_3 (\times \text{D}_4)}{\text{BW}(\times \text{LE})}$$

Where:

Dose	= predicted chronic daily intake (mg/kg-day)
C_F	= concentration of contaminant in country food such as fish (inorganic arsenic in fish = 0.0074 mg/kg)
IR_F	= receptor ingestion rate for country food type such as fish (e.g., 0.29 kg/d)
RAF_{Oral}	= relative absorption factor from the gastrointestinal tract (1.0) (unit-less)
D_i	= days per year exposed (365 days/365-day year)
D_4	= total years exposed to site (60 years) (for assessment of carcinogens only)
BW	= body weight (70.7 kg)
LE	= life expectancy (80 years) (for assessment of carcinogens only)

$$Dose_{non-carcinogen} = \frac{(0.0074\ mg/kg \times 0.29 kg/d \times 1.0 \times \frac{365d}{365d})}{(70.7kg)}$$

$$Dose_{non-carcinogen} = 3.0 \times 10^{-5}\ mg/kg - day$$

$$Dose_{carcinogen} = \frac{(0.0074\ mg/kg \times 0.29 kg/d \times 1.0 \times \frac{365d}{365d} \times \frac{60y}{80y})}{(70.7kg)}$$

$$Dose_{carcinogen} = 2.3 \times 10^{-5}\ mg/kg - day$$

RISK CHARACTERIZATION

Non-Carcinogenic Constituents

Non-carcinogens are considered to be threshold chemicals where a specific dose must be exceeded before a health effects is observed. The likelihood of a potential adverse health effect is represented by a Hazard Quotient (HQ), which is calculated as the ratio of a given chemical dose to the chemical's corresponding non-carcinogenic TRV:

$$HQ = \frac{Dose}{TRV}$$

Where:

HQ = non-carcinogenic hazard quotient

Dose = dose for each constituent (mg/kg-day)

TRV = non-carcinogenic toxicity reference value (mg/kg-day)

The following calculation was used to estimate the HQ for the worker receptor group as a result of exposure to HEPH via inadvertent soil ingestion at the Site.

$$HQ = \frac{1.375\times10^{-5}\ mg/kg-day}{1\times10^{-3} mg/kg-day} = 0.014$$

Carcinogenic Constituents

For carcinogens, the risk of cancer is assumed to be proportional to dose and exposure results in a given probability of risk. Carcinogenic risk probabilities for the trench/utility worker inhalation pathway were calculated by multiplying the EEC in trench vapour by the cancer unit risk factor for each carcinogen.

The following formula was used to calculate risk estimates for carcinogenic adverse health effects (i.e., incremental lifetime cancer risk or ILCR) for benzene:

$$ILCR = Dose\ (mg/kg-day)\times Slope\ Factor(mg/kg-day)^{-1}$$

Where:

Dose = carcinogenic dose ($3.17\text{x}10^{-6}$ mg/kg-day)

Slope Factor = Route- and chemical-specific cancer slope factor ((1.8 mg/kg-day)$^{-1}$)

The following calculation was used to estimate the ILCR for the worker receptor group as a result of inhalation of indoor air at the Site.

$$ILCR = (3.17\times10^{-6}\frac{mg}{kg}-day)\times(1.8\frac{mg}{kg}-day)^{-1} = 5.7\times10^{-6}$$