

**ANVIL RANGE MINE
TIER 2 ECOLOGICAL AND HUMAN HEALTH
RISK ASSESSMENT OF
REMEDICATION SCENARIOS**

Prepared for:

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1.0 INTRODUCTION

The Faro Mine Closure Planning Office commissioned SENES Consultants Limited to carry out a screening level ecological and human health risk assessment for the Anvil Range Mine Complex to assist in the development of closure options for the site. The assessment considered the effects of both predicted contaminant levels in the aquatic environment and measured contaminant levels in the terrestrial environment at the site. This report details the methodology and critical assumptions used for the assessment. The scenarios evaluated were selected only to represent a range of possible loadings to the environment from different sources at the Anvil Range Mine Complex; that is, they do not represent specific remedial plans or alternatives.

The risk assessment process is iterative in nature and is typically revisited over the course of a project as remediation options are developed in greater detail and environmental conditions become better defined. The first stage of the iterative process is to carry out a comparative risk assessment of different remediation scenarios. For the Anvil Range Complex, an initial set of remediation scenarios was defined by the engineering team to encompass a range of assumptions regarding geochemical properties of the mine wastes and collection and treatment efficiencies of contaminated surface and sub-surface waters. Preliminary risk estimates were generated and during the course of this exercise, the engineering team determined that better collection efficiencies could be realized from the initial estimates that they had provided to the risk assessment team. This report presents the results of the assessment of ecological and human health risks for remediation scenarios covering a range of assumptions encompassing current and future conditions.

Our experience on similar projects suggests that the next step in the risk assessment process involves communicating the assessment findings to the various stakeholders. Following development of specific remediation options for the Anvil Range Mine Complex, it is expected that the risk assessment would be updated to investigate the effects and risks associated with each options and to take into account other site-specific information that becomes available from ongoing environmental investigations. Once the final remediation plan is developed, the final step in the process will be to carry out a comprehensive risk assessment of the residual effects and ecological and human health risks for the preferred remediation alternative.

The focus of the risk assessment was on the effects of predicted changes to contaminated levels in the aquatic environment as this component of the environment has the potential to be the most impacted in the future. Nonetheless, the potential effects of elevated levels of contaminants in soil, vegetation and animals from a terrestrial perspective were also evaluated.

1.1 RISK ASSESSMENT SCENARIOS

The Anvil Range Mine includes facilities at two locations, the Faro site and the Vangorda/Grum site. The Faro site is located within the Rose Creek watershed, a tributary of the Anvil Creek watershed, while the Vangorda/Grum site is located within the Vangorda Creek watershed. Both watersheds empty into the Pelly River. Therefore, the assessment evaluated potential adverse effects on the Anvil Range watershed (including the Rose Creek watershed), the Vangorda Creek watershed and the Pelly River from an aquatic environment perspective.

The scenarios considered in the assessment were based on water quality predictions developed by SRK Consulting to illustrate the range of potential aquatic effects that could result from the various sources at the Anvil Range Mine Complex, under a range of remediation options. Appendix A provides the predicted concentrations provided by SRK. Since closure alternatives for the site have not been developed, none of the scenarios presented in this report is intended to represent a planned alternative. The effects of selected alternatives will be evaluated at a later date after remedial plans have been developed. As previously noted, the risk assessment discussed in this report was undertaken to provide guidance to the remediation design team on the selection of remediation options.

The four scenarios and the modeling assumptions applied for each scenario are described below. For two of the scenarios, contaminant levels in the receiving environment were assessed for “best case” and for possible “worst case” conditions related to seepage quality and “acid generating” potential of the rock.

1.1.1 “Existing” Scenario

The “Existing” scenario is intended to illustrate the effects of the current water quality from the respective sites. This scenario evaluates current effects by utilizing 2002 to 2004 monitoring data from receiving water locations on the respective watersheds identified previously. The results for this scenario provide a point of reference against which the effects of potential remediation can be compared. The scenario does not take into account any of the soluble contaminant loads that are currently being produced on the site, but which have not yet reached the receiving waters (i.e. contaminant loads associated with groundwater plumes).

Existing conditions were based on data collected during the 2002 to 2004 period in various sampling campaigns (Gartner Lee 2004). The current contaminant loads measured in the receiving waters are significantly less than what is anticipated to occur in the future because some sources have not reached peak oxidation rates and some contaminants have not emerged from their source due to attenuation and/or long travel times. This means that the current management approach would have to be modified in the future in order to achieve an equivalent level of environmental protection as is currently realized.

1.1.2 “No Intervention” Scenario

The “No Intervention” scenario considers two cases (Future 1 and Future 3) assuming the site is abandoned and there is no active management or treatment of contaminated waters. These two cases are intended to illustrate the potential effects which would occur in the future based on the different seep concentrations and the likelihood that the rock types would meet their full acid generating potential. The scenario assumes no control or collection of water flows into or out of waste rock dumps, mine pits and the tailings basin. All flows and contaminant loads are assumed to report to the receiving environment.

For the Future 1 assessment, “current average loading” results from the water quality modeling were used. The Future 1 assessment is based on average measured seep concentrations that are representative of partially oxidation of sulphide minerals in the mine wastes. For the assessment of Future 3 conditions, “future worst loading” results derived from water quality modeling were used. This corresponds to the maximum predicted seep concentrations assuming near complete oxidation of sulphide minerals in the mine wastes so that the maximum acid generating potential is realized.

The “No-Intervention” scenario does not take into consideration the effects of catastrophic failure events that may result if the site were abandoned in its current condition.

1.1.3 Hypothetical “Remediation” Scenarios

The hypothetical “Remediation” scenarios also examines the potential effects in the future using two cases (Future 2 and Future 3) which represent the effects of a combination of source control measures to reduce contaminant loads as well as collection and treatment of contaminated waters. The scenarios do not represent the planned closure scenario. The effects of more detailed closure alternatives will be considered once such alternatives have been further developed.

Both Remediation scenarios make the following assumptions:

- All sulphide cells, low-grade ore and oxide fines are left at current locations and provided with good covers. Covers are assumed to restrict infiltration to 5% of mean annual precipitation.
- Remaining waste rock dumps are provided with rudimentary covers that restrict infiltration to 20% of mean annual precipitation.
- 90% of dump seepage flows are captured and sent to treatment. The remainder of seepage by-passes the collection system and reports directly to receiving waters.
- 95% of seepage capture at emergency tailings area (ETA).
- Surface runoff from covered waste rock dumps is assumed to be clean.
- Tailings are provided with a rudimentary cover that restricts infiltration to approximately 18.7% of Mean Annual Precipitation (18.7% is the current estimate of

infiltration into the tailings – the rudimentary cover is assumed to have no effect on the infiltration rate).

- 98% of tailings seepage is captured and sent to treatment. Balance of seepage bypasses the collection system and reports directly to receiving waters.
- All tailings runoff reports to a treatment plant.
- Treatment plant effluent is assumed to be discharged at station X14 on Rose Creek at the Faro site and at station V27 on Vangorda Creek at the Vangorda/Grum site.
- Faro pit water is pumped to a treatment plant.
- Grum pit is assumed to be flow through with pit water released untreated to Vangorda Creek.
- Vangorda pit is assumed to be backfilled.

The difference between the two Remediation scenarios was in the assumed water quality. For the Future 2 scenario, estimates of contaminant concentrations in the discharge from each source were based on currently measured concentrations. For the Future 3 scenario, “worst case” estimates of contaminant concentrations were used.

1.1.4 “Treat All Flows” Scenario – Collection and Treatment of All Contaminated Waters

The “Treat All Flows” scenario is intended to illustrate the future effects of collecting all contaminated water from the site and releasing it as treated effluent. The scenario does not include consideration of any source control activities, though it is recognized that these may provide more effective protection of the aquatic environment in some cases.

While collection of 100% of the contaminated water is not practical, the scenario is intended to provide insight into the level of source control that may be required in order to achieve acceptable receiving water conditions. The scenario evaluates future receiving water quality where contaminants produced from the waste rock dumps, the tailings basin and the pit walls on the site are collected for treatment.

The risk assessment was carried out for Future 3 using the “future worst loading” results from the water quality modeling which provides estimates of effects of 100% collection and treatment under peak contaminant loading conditions. The treatment plant effluent is assumed to be discharged at station X14 on Rose Creek at the Faro site and at station V27 on Vangorda Creek at the Vangorda/Grum site.

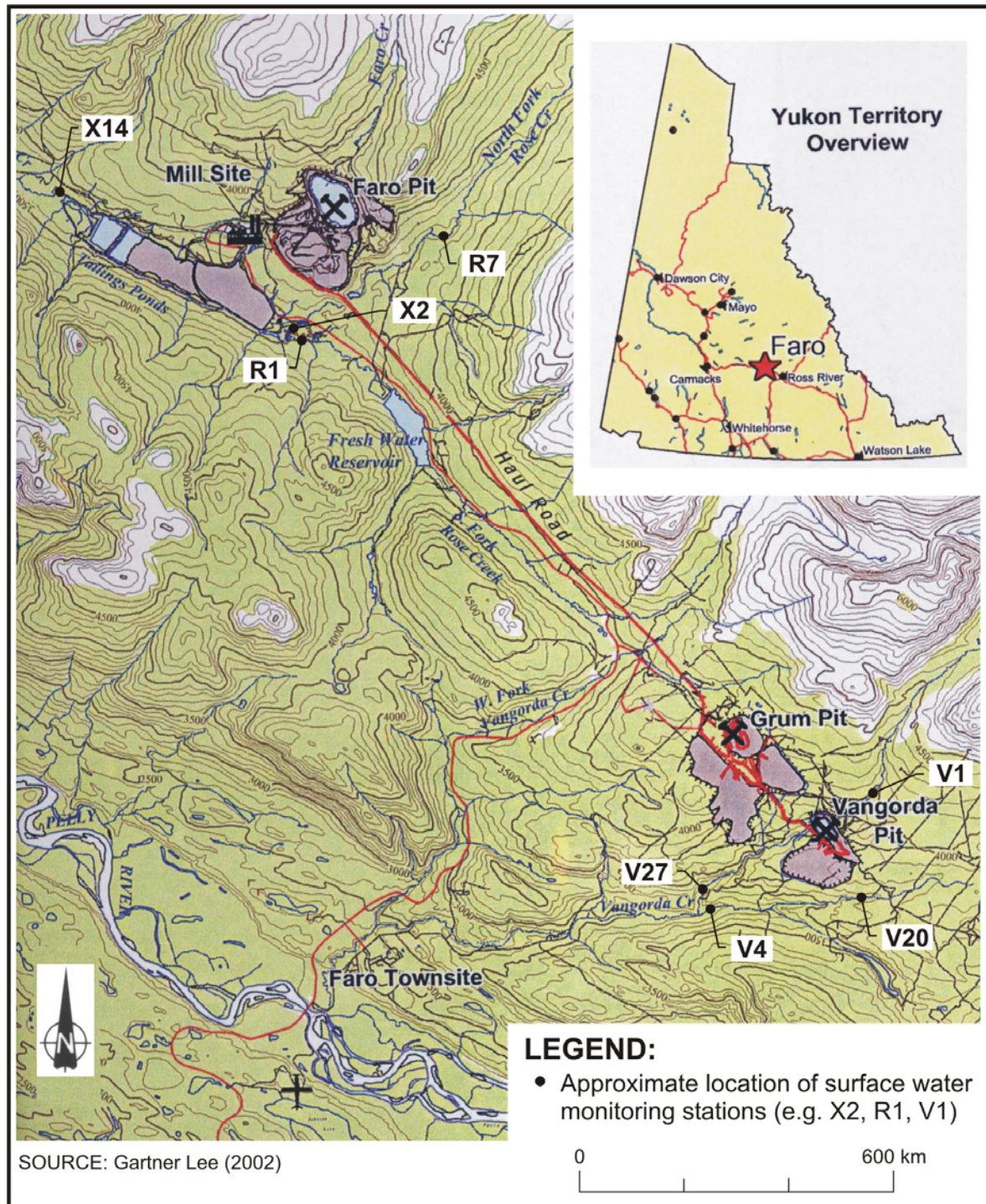
Table 1.1-1 provides a summary of the water quality assumptions used in the risk assessment based on the discussions provided above and Figure 1.1-1 provides a site map of the Faro and Vangorda mine sites and the approximate locations of the sampling stations used in the assessment.

TABLE 1.1-1
WATER QUALITY USED IN ECOLOGICAL AND HUMAN HEALTH RISK ASSESSMENT

Scenario Aquatic Areas	“Existing” Conditions Scenario	“No Intervention” Scenario		“Remediation” Scenario		“Treat all Flows” Scenario (Future 3)
		Future 1	Future 3	Future 2 (better capture efficiencies)	Future 3	
Rose Creek Upstream	95% UCL of Mean Measured Rose Creek U/S Data (Stations R1, R6 and R7)					
Vangorda Creek Upstream	95% UCL of Mean Measured Vangorda Creek U/S Data (Stations V1, V4 and V20)					
Rose Creek Downstream	Mean of measured data at stations X2 & X14	BaseCase_NoIntervention.xls		Case2_RemediatedExample.xls		Case1_TreatAllFlows.xls
		Mean of stations X2 & X14 in "Base Case Current"	Mean of stations X2 & X14 in "Future Worst Case" scenario	Mean of stations X2 & X14 in "Intermediate Loadings" scenario	Mean of stations X2 & X14 in "Future Worst" scenario	Mean of stations X2 & X14 in " Future Worst " scenario
Vangorda Creek Downstream	Mean of measured data at station V27	Station V27 in "Current Average" scenario	Station V27 in "Future Worst Case" scenario	Station V27 in "Current Max" scenario	Station V27 in "Future Worst" scenario	Station V27 in " Future Worst " scenario
Anvil Creek at Pelly River	No data available – not considered	Mouth of Anvil Creek in "Current Average" scenario	Mouth of Anvil Creek in "Future Worst Case" scenario	Mouth of Anvil Creek in "Current Max" scenario	Mouth of Anvil Creek in "Future Worst" scenario	Mouth of Anvil Creek in " Future Worst " scenario
Pelly River at Crossing	Mean of MOE Data	Station Pelly River at Crossing in "Current Average" scenario	Station Pelly River at Crossing in "Future Worst Case" scenario	Station Pelly River at Crossing in "Current Max" scenario	Station Pelly River at Crossing in "Future Worst" scenario	Station Pelly River at Crossing in " Future Worst " scenario
Pelly River Upstream	Pelly River above Vangorda Creek in "Base Case Current" scenario from BaseCase_NoIntervention.xls					
Site-Wide	Average of Rose Creek U/S, Rose Creek D/S, Vangorda Creek U/S, Vangorda D/S and Pelly River at Crossing					

Notes: UCL = upper 95% confidence limit. U/S = upstream. D/S = downstream.
The water quality model spreadsheets are provided in Appendix A.

FIGURE 1.1-1
ANVIL RANGE MINE COMPLEX SITE MAP
AND LOCAL CREEK MONITORING STATIONS



Source: Gartner Lee (2002).

Note: Approximate location of surface water quality monitoring stations (e.g. X2, R1, V1).

1.2 ASSUMPTIONS USED IN TERRESTRIAL ASSESSMENT

In the terrestrial assessment, a number of assumptions were made regarding the effects of the remedial alternatives under consideration for management of the tailings impoundment, waste rock dumps and pits on the exposure pathways for the terrestrial species. These include:

- Direct consumption of tailings or waste rock or vegetation that may grow on these waste materials was not considered except in the current scenario. As there is little vegetation on these waste materials at present, this is not an unreasonable assumption (e.g. for the “Existing” or “No Intervention” scenarios).
- For remediation alternatives which involve placement of a cover over the tailings and/or waste rock dumps (e.g. the “Remediation” and “Treat All Flows” scenarios), the waste materials would be effectively isolated thus eliminating direct consumption by wildlife. It was also assumed for the purposes of this assessment that the cover thickness would be sufficient to prevent root penetration into, and hence vegetation uptake of metals from, the waste material.
- Metal levels in soils and vegetation in the vicinity of the mine facilities were assumed to be at or near peak levels as they would have been most impacted by emissions while the mine was operating. While some of the remediation alternatives would reduce future wind blown dust emissions from the facilities (source areas) onsite, metal levels in soils and vegetation would not be expected to decline rapidly.
- Also, it was assumed that direct remediation of soils adjacent to the tailings impoundment or waste rock dumps would not be required. The measured metal levels in soils and vegetation were used therefore in the pathways assessment of intakes by the terrestrial species for all alternatives under consideration.
- The main factors affected by the remediation scenarios (i.e. the “No Intervention”, “Remediation” and “Treat All Flows” scenarios) are the metals levels in the downstream aquatic environment (i.e. metals levels in water, sediments, aquatic plants, fish and benthic organisms) in Rose Creek, Anvil Creek, Vangorda Creek and Pelly River. Hence, in the assessment of the effects of the remediation alternatives on terrestrial species, the pathways contributions of the aquatic pathways were varied between alternatives whereas the terrestrial pathways contributions were held constant.

In summary, the terrestrial risk assessment was carried out for “Existing” conditions and the three remediation scenarios described above (i.e. the “No Intervention”, “Remediation” and “Treat All Flows” scenarios). For the “Existing” scenario, measured data in both the aquatic and terrestrial environments were used in the assessment. For the “No Intervention”, “Remediation” and “Treat All Flows” scenarios, measured data on the terrestrial environment were also used in the assessment. To account for the effects of differences in the predicted metal concentrations in

the aquatic environment for the respective remediation scenarios, site-specific transfer factors were used to develop concentrations in various media (sediments, aquatic plants, benthic animals and fish).

If measured soils or vegetation data were not available for a given medium at a specific location or in a particular area then metal concentrations were estimated for the location or area by either: i) using measured data from other locations in the study area with similar characteristics or ii) through the application of site-specific transfer factors derived from measurements at other locations in the study area.

1.3 SELECTION OF CONTAMINANTS OF POTENTIAL CONCERN

A selection process was used to identify the contaminants of potential concern (COPC) at the Anvil Range Mine Complex as described in Appendix B. To summarize, the concentrations in water and soils in the affected area were compared statistically to background/baseline concentrations in the study area. Those contaminants that were found to be significantly different from background/baseline were then compared to CCME guidelines for water (for protection of aquatic life) and/or for soil (for residential/parkland use). The CCME aquatic life guidelines were lower than the CCME drinking water guidelines for the contaminants (metals) considered in this assessment. If the measured levels exceeded either guideline value or if guidelines were not available then the contaminants were carried through the risk assessment. Therefore, contaminants for which CCME aquatic guidelines did not exist and which had CCME drinking water guidelines were carried through the assessment.

For the vegetation samples, the measured concentrations in forage, browse and berry were first compared to background/baseline concentrations in the study area. Once again, those contaminants that were found to be statistically different from background/baseline were then compared to reported phytotoxic levels in plants. This was done to determine whether contaminant levels in the plant had the potential to be toxic to the plant. Contaminant concentrations that were less than phytotoxic levels were automatically dropped from further consideration. Those chemicals which were significantly higher than background but for which there were no phytotoxic values, were also carried through the assessment.

Based on this screening procedure, the following contaminants were identified as COPC: arsenic; cadmium; copper; lead; manganese; nickel; silver; tin; thallium; and zinc.

Hydrocarbons are present in the soils at the Anvil Mine Complex in areas with elevated metals levels. There may also be other organic chemicals present; however, consideration of hydrocarbons and other organic chemicals were beyond the scope of work for this assessment. It

is understood that it is planned to remediate these soils hence, hydrocarbons and other organic chemicals were not considered in the risk assessment.

1.4 REPORT STRUCTURE

The report has been structured into several chapters, each of which describes specific aspects of the risk assessment. These aspects include:

Chapter 2 – Site Characterization: Describes the main features of the watersheds surrounding the Anvil Range Mine Complex. A summary of the most pertinent information from recent surveys of surface water quality, sediment quality, and fish communities in Rose Creek, Anvil Creek and Vangorda Creek is provided to establish current (baseline) conditions. These data were used in the subsequent assessment. Similarly, metals levels measured in soils and vegetation in the study area were evaluated and input to the ecological and human health risk assessments.

Chapter 3 – Receptor Characterization: Identifies the aquatic and terrestrial species selected for inclusion in the risk assessment, as well as, the human receptors (i.e. adults and children) that may spend time in the study area.

Chapter 4 – Exposure Assessment: Describes the pathways model used to predict the fate of contaminants (chemical species) in the environment including their uptake by aquatic and terrestrial species. The pathways of exposure of human receptors and their respective dietary characteristics are described.

Chapter 5 – Hazard Assessment: Details the toxicity benchmarks used in the assessment for each of the chemical species to characterize the risks of potential effects on the health of ecological species and humans.

Chapter 6 – Risk Characterization: Presents the results of the pathways modelling and risk assessments.

Chapter 7 – Summary and Conclusions: Provides a synopsis of the basis used for the ERA and HHRA and the findings of these assessments.

Chapter 8 – References: Lists the reference sources used in this study.

2.0 SITE CHARACTERIZATION

The information provided in this chapter provides a summary of the measured data for the contaminants of potential concern (COPC) used to assess the “Existing” scenario at the Faro site. The detailed discussion of all the data is provided in Appendix C. This chapter also provides the methodology for the calculation of the concentrations of COPC in various environmental media for the other scenarios considered in the assessment.

2.1 ANVIL RANGE MINING COMPLEX

The Anvil Range Mining Complex, as shown in Figure 1.1-1, is located about 200 km northeast of Whitehorse and includes the Faro Mine site (in production from 1969 to 1992) and the Vangorda Plateau Mine site (in production from 1986 to 1998). The Faro Mine site is 15 km north of the town of Faro and contains a mill, open pit and tailings impoundment and other associated facilities. The Vangorda Plateau Mine site is 9 km northeast of the town of Faro and includes two open pits and associated mine facilities. The operation produced lead and zinc concentrates. The Faro Mine site is located within the Rose Creek watershed, which is a tributary of the Anvil Creek watershed, and the Vangorda Plateau Mine site is located within the Vangorda Creek watershed. Both watersheds empty into the Pelly River. This assessment considered Rose Creek, Vangorda Creek, Anvil Creek and the Pelly River.

2.2 AQUATIC ENVIRONMENT

This section discusses surface water and sediment quality for the COPC within the Rose Creek and Vangorda Creek watersheds which were obtained from various sampling campaigns by Gartner Lee Limited. It also provides information for the Pelly River, which was obtained from the Environment Canada website. Measured concentrations of COPC in fish flesh (muscle) are also provided in this section.

Surface water at Faro Mine site and Vangorda Plateau Mine site has been routinely sampled to assess water quality. Some stations are sampled regularly on a monthly schedule while others are sampled on a seasonal or annual basis. Measured water quality data for the period of 2002-2004 were provided by Gartner Lee Limited (2005a) and used in this study. The use of data for this time period provides a snapshot of the current conditions at the site.

For the Pelly River, data from Environment Canada website up to 1996, and data from the Selkirk First Nations Report on the “Pelly River Aquatic Effects Assessment” (2004) were considered in the assessment.

Sediment data from the most recent sediment monitoring program conducted in July 2004 (Laberge 2004) were used to assess the sediment quality of the Rose Creek watershed. The use of this data reflects current conditions at the site.

Flesh samples from slimy sculpin and Arctic grayling collected during a field investigation (White Mountain Environmental Consulting 2004) conducted in the summer of 2004 were used to provide fish tissue (muscle) concentrations under current conditions.

2.2.1 Surface Water Quality

As described above, water quality data collected over the 2002 to 2004 period within the Rose Creek and Vangorda Creek watersheds are summarized below. Data for the Pelly River was limited and no measurements were available after 1996; therefore data from 1992 to 1996 are summarized below. A detailed list of the water quality data is provided in Appendix C.

After a preliminary review of the data, it was determined that there were some limitations in the 2002 to 2004 water quality database on Rose Creek and Vangorda Creek watersheds as several of the measurements were reported as less than method detection limits and some measurements were reported with high method detection limits. For the purpose of calculating summary statistics for these data, some of the samples with measurements for arsenic, copper and silver had to be excluded due to the high method detection limits; for other detection limit issues, concentrations measured as less than the detection limit (“<”) were considered as equal to ½ the detection limit. Even with the exclusion of selected data, the number of samples in both Rose Creek and Vangorda Creek are considered to be representative of the water quality in these two watersheds. Details are given in Appendix C.

Rose Creek Watershed

Surface water quality data were collected at different locations in the Rose Creek watershed. Table 2.2-1 provides a list of monitoring stations in Rose Creek. Stations upstream of the mine are considered to be representative of background water quality conditions since pre-mining conditions in Rose Creek are not available.

As seen from the table, water quality data for Rose Creek were summarized into two aquatic areas identified as Rose Creek U/S (stations R1, R6 and R7) and Rose Creek D/S (stations X2 and X14). Figure 2.1-1 provides the location of these sampling stations.

**FIGURE 2.1-1
LOCATION OF SAMPLING STATIONS IN STUDY AREA**

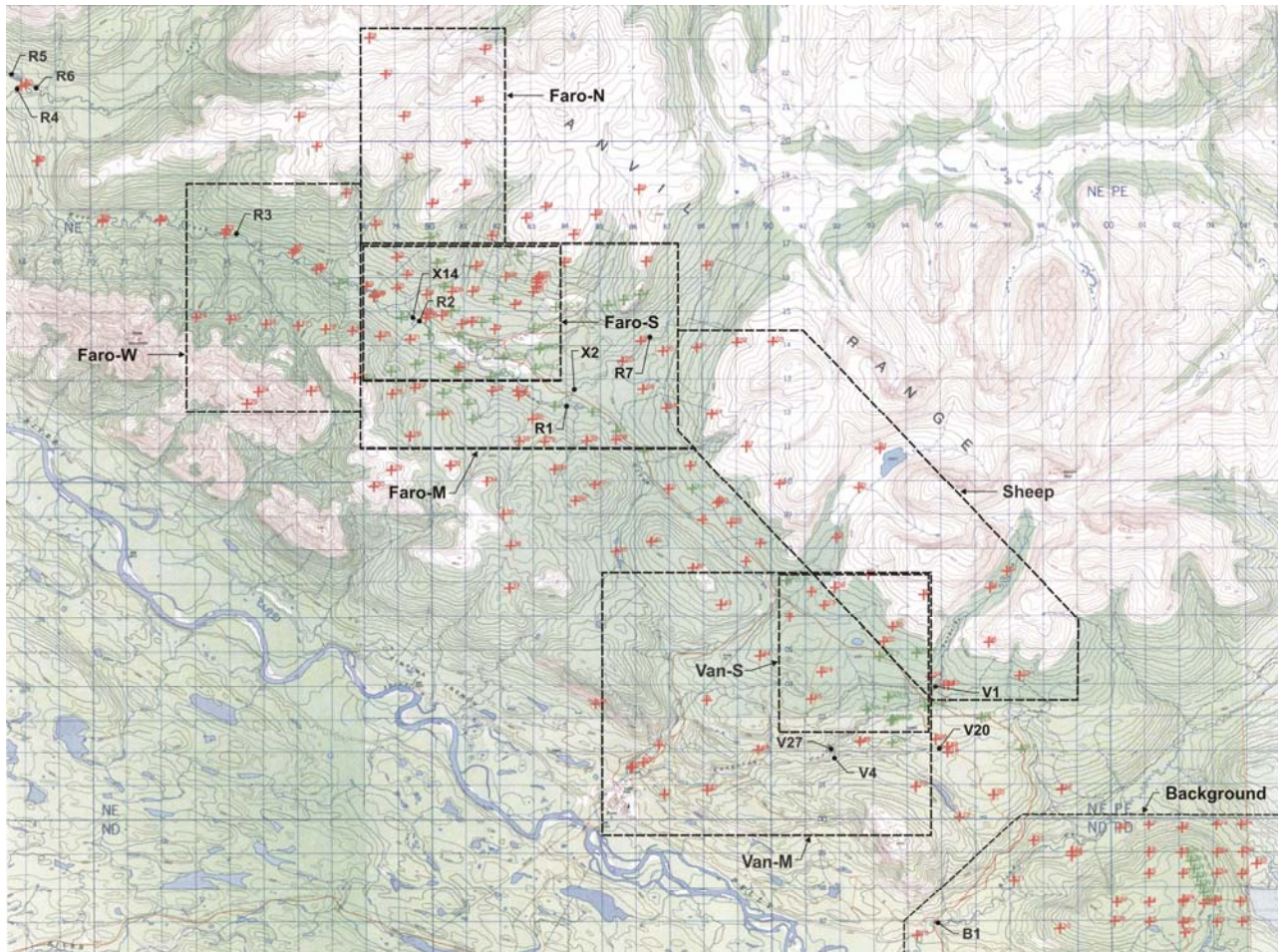


**TABLE 2.2-1
MONITORING STATIONS IN ROSE CREEK**

UPSTREAM/BACKGROUND STATIONS	
R1	Upstream of the confluence of the North and South Forks of Rose Creek
R6	Anvil Creek upstream of Rose Creek
R7	North Fork of Rose Creek upstream of Faro Creek diversion
DOWNSTREAM	
X2	North Fork of Rose Creek upstream of mine access road
X14	Rose Creek, downstream of diversion channel

Sources: Gartner Lee Limited (2002) and Laberge (2004).

Total metal concentrations for the COPC in the Rose Creek watershed are summarized in Table 2.2-2.

Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

**TABLE 2.2-2
SUMMARY OF MEASURED DATA FOR COPC IN ROSE CREEK**

COPC	Units	No. of Obs.	No. of Obs. < MDL	Minimum	Median	95 th Percentile	Maximum	Mean	Std. Dev.	95% UCL of Mean	CCME Aquatic Life (Fresh Water)	CCME Drinking Water
Rose Creek Upstream												
Arsenic	mg/L	19	17	0.0005	0.0005	0.003	0.003	0.0008	0.0008	0.001	0.005	0.005 ¹
Cadmium	mg/L	19	15	0.0001	0.0001	0.001	0.001	0.0002	0.00024	0.00029	0.000017	0.005
Copper	mg/L	14	12	0.0005	0.0005	0.005	0.005	0.0009	0.0012	0.0014	0.002	1.0 ²
Lead	mg/L	19	16	0.0005	0.0005	0.015	0.015	0.001	0.003	0.003	0.001	0.01
Manganese	mg/L	19	0	0.006	0.017	0.19	0.19	0.028	0.042	0.045	-	0.05 ²
Nickel	mg/L	19	13	0.0005	0.0005	0.004	0.004	0.00097	0.00097	0.001	0.025	-
Silver	mg/L	19	19	0.0001	0.0001	0.0001	0.0001	0.0001	--	0.0001	0.0001	-
Thallium	mg/L	6	6	0.00005	0.00005	0.00005	0.00005	0.00005	--	0.00005	0.0008	-
Tin	mg/L	19	15	0.0005	0.0005	0.038	0.038	0.004	0.009	0.008	-	-
Zinc	mg/L	19	9	0.0005	0.006	0.18	0.18	0.026	0.049	0.045	0.03	5.0 ²
Rose Creek Downstream												
Arsenic	mg/L	76	65	0.0005	0.0005	0.005	0.011	0.001	0.0017	0.0014	0.005	0.005 ¹
Cadmium	mg/L	77	62	0.0001	0.0001	0.0007	0.0022	0.00025	0.0003	0.0003	0.000017	0.005
Copper	mg/L	22	16	0.0005	0.0095	0.003	0.006	0.001	0.0013	0.0016	0.002	1.0 ²
Lead	mg/L	76	38	0.0005	0.00075	0.016	0.021	0.004	0.0052	0.005	0.001	0.01
Manganese	mg/L	76	0	0.016	0.288	2.218	2.37	0.58	0.67	0.71	-	0.05 ²
Nickel	mg/L	76	28	0.0005	0.002	0.008	0.015	0.0026	0.0027	0.003	0.025	-
Silver	mg/L	77	56	0.0001	0.0001	0.0009	0.0019	0.00024	0.0003	0.0003	0.0001	-
Tin	mg/L	77	39	0.0005	0.003	0.03	0.322	0.0097	0.038	0.017	0.0008	-
Zinc	mg/L	76	0	0.007	0.03	0.085	0.107	0.035	0.022	0.039	0.03	5.0 ²

Note: Values shaded in yellow were used in the risk assessment.

¹ – Proposed guideline – not approved.

² – Based on aesthetic objectives.

From Table 2.2-2, it can be seen that more samples are available for the downstream stations than the upstream stations. For the purposes of the risk assessment, the 95% upper confidence level (UCL) of the mean was used to represent both the upstream and downstream measurements. From the table the following observations can be made:

- Mean metal concentrations at the downstream stations are generally higher than the upstream concentrations. Manganese concentrations are over an order of magnitude higher in the downstream stations. Zinc concentrations measured at the downstream stations on Rose Creek are 73% higher than those measured at the upstream locations.
- Arsenic, cadmium, lead, silver, thallium and tin concentrations are mostly measured below the detection limit at the upstream locations on Rose Creek.
- Concentrations of thallium are not analyzed in downstream locations. Therefore, thallium is not included in the table for the downstream location.

Vangorda Creek Watershed

Monitoring data from the 2002 to 2004 period were used to characterize existing water quality for locations upstream and downstream of the Grum and Vangorda mines. Stations upstream of the mines are considered to be representative of background or baseline water quality conditions and the use of these stations as background water quality is consistent with Gartner Lee Limited (2002). For Vangorda Creek, the upstream locations of V1 (Vangorda Creek upstream of mine activities), V4 (Shrimp Creek) and V20 (Vangorda Creek northeast diversion ditch) were considered representative of background water quality. Stations downstream of the mine are assumed to be influenced by the mine workings. For this assessment, station V27 was selected as the most appropriate downstream location. These monitoring locations are described in Table 2.2-3 and shown on Figure 2.1-1.

TABLE 2.2-3
MONITORING STATIONS IN VANGORDA CREEK

UPSTREAM/BACKGROUND STATIONS	
V1	Vangorda Creek upstream of mine activities
V4	Shrimp Creek
V20	Vangorda Northeast diversion ditch
DOWNSTREAM	
V27	Main Stem Vangorda Creek (Upper)

Source: Gartner Lee Limited (2002)

Summary statistics of the data collected from the upstream and downstream stations are presented in Table 2.2-4.

TABLE 2.2-4
SUMMARY OF MEASURED DATA FOR COPC IN VANGORDA CREEK

COPC	Units	No. of Obs.	No. of Obs. < MDL	Minimum	Median	95 th Percentile	Maximum	Mean	Std. Dev.	95% UCL of Mean	CCME Aquatic Life (Fresh Water)	CCME Drinking Water
Vangorda Creek Upstream												
Arsenic	mg/L	22	17	0.0002	0.0005	0.019	0.027	0.003	0.007	0.006	0.005	0.005 ¹
Cadmium	mg/L	22	17	0.00002	0.0001	0.001	0.0013	0.00027	0.00035	0.0004	0.000017	0.005
Copper	mg/L	5	2	0.0005	0.0006	0.003	0.003	0.0013	0.0011	0.0024	0.002	1.0 ²
Lead	mg/L	22	9	0.0005	0.004	0.008	0.008	0.003	0.003	0.004	0.001	0.01
Manganese	mg/L	22	2	0.0005	0.007	0.039	0.04	0.016	0.015	0.021	-	0.05 ²
Nickel	mg/L	22	9	0.0003	0.0015	0.021	0.021	0.004	0.006	0.006	0.025	-
Silver	mg/L	22	17	0.0001	0.0001	0.0021	0.0037	0.0005	0.0009	0.0008	0.0001	-
Thallium	mg/L	13	12	0.00001	0.001	0.002	0.002	0.0007	0.0006	0.001	0.0008	-
Tin	mg/L	22	13	0.0001	0.001	0.03	0.035	0.0051	0.009	0.008	-	-
Zinc	mg/L	22	5	0.0005	0.008	0.046	0.054	0.014	0.016	0.019	0.03	5.0 ²
Vangorda Creek Downstream												
Arsenic	mg/L	6	3	0.0005	0.0038	0.02	0.02	0.006	0.008	0.013	0.005	0.005 ¹
Cadmium	mg/L	6	4	0.0001	0.0001	0.0029	0.0029	0.00063	0.0011	0.0016	0.000017	0.005
Copper	mg/L	2	0	0.001	0.0015	0.002	0.002	0.0015	0.0007	0.005	0.002	1.0 ²
Lead	mg/L	6	1	0.0005	0.004	0.011	0.011	0.004	0.004	0.008	0.001	0.01
Manganese	mg/L	6	0	0.008	0.012	0.038	0.038	0.015	0.011	0.025	-	0.05 ²
Nickel	mg/L	6	2	0.0005	0.003	0.015	0.015	0.0045	0.006	0.009	0.025	-
Silver	mg/L	6	5	0.0001	0.0001	0.0003	0.0003	0.0001	0.00008	0.0002	0.0001	-
Thallium	mg/L	4	4	0.00005	0.0005	0.001	0.001	0.0005	0.00055	0.0012	0.0008	-
Tin	mg/L	6	2	0.0005	0.002	0.028	0.028	0.006	0.011	0.015	-	-
Zinc	mg/L	6	0	0.032	0.098	0.175	0.175	0.09	0.054	0.13	0.03	5.0 ²

Note: Values shaded in yellow were used in the risk assessment.

¹ – Proposed guideline – not approved.

² – Based on aesthetic objectives.

Similar to Rose Creek, the 95% UCL of the mean was used for COPC at both the upstream and downstream locations. From Table 2.2-4, some general observations respecting the COPC levels measured at the upstream and downstream locations are noted as follows:

- At stations upstream of the Vangorda Plateau mine site, mean concentrations of COPC are generally lower than those measured downstream.
- Most of the arsenic and cadmium samples at upstream locations were measured below the detection limit.
- Over 90% of the samples collected for thallium and silver at both upstream and downstream stations in Vangorda Creek were found to have concentrations below MDL.

Anvil Creek Watershed

Data for Anvil Creek has been reported in the Selkirk First Nation report. The relevant data for use in this assessment is summarized in Table 2.2-5. These values were used in the assessment of “Existing” conditions.

TABLE 2.2-5
SUMMARY OF MEASURED DATA FOR COPC IN ANVIL CREEK

COPC	Units	Anvil Creek D/S of Rose Creek A4	CCME Aquatic Life (Fresh Water)	CCME Drinking Water
Arsenic	mg/L	0.004	0.005	0.005 ¹
Cadmium	mg/L	0.00002	0.000017	0.005
Copper	mg/L	0.001	0.002	1.0 ²
Lead	mg/L	0.0005	0.001	0.01
Manganese	mg/L	0.031	-	0.05 ²
Nickel	mg/L	0.0009	0.025	-
Silver	mg/L	0.0002	0.0001	-
Thallium	mg/L	<0.00005	0.0008	-
Tin	mg/L	<0.001	-	-
Zinc	mg/L	0.015	0.03	5.0 ²

Note:

¹ – Proposed guideline – not approved.

² – Based on aesthetic objectives.

Pelly River

Data for Pelly River from the Environment Canada website as well as the Selkirk First Nations report were evaluated. Table 2.2-6 summarizes the data from the Pelly River at Pelly Crossing that was used in the assessment.

TABLE 2.2-6
SUMMARY OF MEASURED DATA FOR COPC IN PELLY RIVER
AT PELLY CROSSING

COPC	Units	No. of Obs.	No. of Obs. < MDL	Minimum	Median	95th Percentile	Maximum	Mean	Std. Dev.	95% UCL of Mean	CCME Aquatic Life (Fresh Water)	CCME Drinking Water
Pelly River at Pelly Crossing												
Arsenic	mg/L	33	0	0.0001	0.0005	0.0051	0.016	0.0015	0.0030	0.0024	0.005	0.005 ¹
Cadmium	mg/L	45	7	0.00005	0.0001	0.0017	0.0035	0.00039	0.0007	0.0006	0.000017	0.005
Copper	mg/L	45	0	0.0002	0.0018	0.019	0.029	0.0048	0.0066	0.0064	0.002	1.0 ²
Lead	mg/L	45	16	0.0001	0.0003	0.0071	0.017	0.0016	0.0032	0.0024	0.001	0.01
Manganese	mg/L	45	0	0.0001	0.0215	0.31	0.63	0.079	0.131	0.112	-	0.05 ²
Nickel	mg/L	45	0	0.0002	0.0024	0.019	0.033	0.0051	0.0072	0.0070	0.025	-
Silver	mg/L	6	1	0.00005	0.0001	0.00018	0.0002	0.00011	0.00005	0.00015	0.0001	-
Zinc	mg/L	45	0	0.0002	0.0063	0.097	0.159	0.022	0.036	0.031	0.03	5.0 ²

Note: Values shaded in yellow were used in the risk assessment.

As expected, measured concentrations of COPC in Pelly River at Pelly Crossing (Table 2.2-5) are lower than those measured in Rose Creek (Table 2.2-2) and Vangorda Creek (Table 2.2-4).

2.2.2 Sediment Quality

Sediment samples were collected in July 2004 from seven sites (R1 to R7) located on Rose and Anvil Creeks as part of a biological and sediment monitoring program (Laberge 2004). Table 2.2-7 provides a brief description for the sampling stations. Stations R1, R6 and R7 are located upstream of site facilities and are considered as reference sites. Three replicate stream sediment samples were collected and analyzed from each site. Figure 2.1-1 shows the sample locations.

No sediment samples were collected from the Vangorda Creek watershed during the 2004 monitoring program.

**TABLE 2.2-7
SEDIMENT SAMPLING STATIONS**

Site ID	Site Description
R1	Upstream of the confluence of the North and South Forks of Rose Creek
R2	In the mixing zone downstream of the intersection of the Rose Creek diversion canal and the outlet of the tailings pond
R3	Rose Creek approximately half way between the tailings pond outlet and Anvil Creek
R4	Rose Creek just upstream of Anvil Creek
R5	Anvil Creek approximately 150 m downstream of Rose Creek
R6	Anvil Creek immediately upstream of Rose Creek
R7	North Fork of Rose Creek upstream of the confluence with the Faro Creek diversion

Summary statistics for the upstream (reference) sites and downstream sites are provided on Table 2.2-8.

TABLE 2.2-8
SEDIMENT QUALITY AT ROSE AND ANVIL CREEKS

COPC	Units	Downstream Sites (N=12)					Reference Sites (N=9)				
		N<MDL	Min.	Mean	Max	Std. Dev	N<MDL	Min.	Mean	Max	Std. Dev
Arsenic	mg/kg (dw)	0	8.0	15.2	24.3	4.3	0	8.9	12.1	18.0	3.2
Cadmium	mg/kg (dw)	0	0.5	0.92	1.7	0.40	0	0.40	0.63	1.20	0.25
Copper	mg/kg (dw)	0	17.0	46.5	89.0	22.5	0	11.0	18.6	27.0	5.6
Lead	mg/kg (dw)	0	24.7	148.9	264.0	66.5	0	7.9	50.3	249.0	77.8
Manganese	mg/kg (dw)	0	923	2682	6410	1675	0	608	1096	2520	571
Nickel	mg/kg (dw)	0	23.0	35.8	48.0	8.1	0	17.0	25.6	35.0	6.7
Silver	mg/kg (dw)	2	0.05	0.29	0.50	0.14	5	0.05	0.09	0.30	0.08
Thallium	mg/kg (dw)	0	0.10	0.30	0.50	0.11	1	0.05	0.15	0.30	0.08
Tin	mg/kg (dw)	10	2.5	6.6	40.0	11.0	9	2.5	2.5	2.5	0.0
Zinc	mg/kg (dw)	0	83.0	341.1	607.0	147.1	0	46.0	116.0	336.0	87.9

Notes: Observations reported as less than MDL were assumed to be at half of the MDL.

2.2.2.1 Development of Site-Specific Sediment Distribution Co-efficients

As seen from the previous discussion, sediment measurements were available for Rose Creek in the 2004 monitoring program, therefore, in order to predict sediment concentrations in the other watersheds as well as sediment concentrations into the future, there became a need to predict these sediment concentrations. The simplest and most commonly used methodology to predict sediment concentrations is to apply a distribution coefficient to the water concentration to predict the sediment concentration. It is recognized that the use of a distribution coefficient does not take into account the many different sediment processes (i.e. burial, resuspension etc.), however, it provides a reasonable estimate of the sediment concentration.

In order to develop site-specific water-to-sediment distribution coefficients, water quality data measured at and adjacent to sampling locations R1 to R7 were summarized and matched with the sediment quality data measured at the same location. Water quality monitoring stations X2 and X3 were summarized with station R1 and stations X10 and X14 were summarized with station R2. For each site, the average sediment concentrations of the three replicates were then divided by the corresponding average water concentrations to obtain an estimate of the water-to-sediment distribution coefficients for all COPC. For each COPC, if three water samples or less were measured with concentrations above the MDL for a sampling location, then the water-to-sediment distribution coefficient for this COPC was not calculated at this particular location.

The estimated distribution coefficients were then summarized and the mean values were used as the site-specific water-to-sediment coefficients as shown on Table 2.2-9. These values were based on six to nine samples which is considered to be adequate. Value derived from the

literature are provided for perspective. It is generally accepted that site-specific distribution coefficients are better to use in assessments than literature derived values.

TABLE 2.2-9
SITE-SPECIFIC WATER-TO-SEDIMENT DISTRIBUTION COEFFICIENTS
FACTORS FOR ANVIL RANGE MINE COMPLEX

COPC	No. of Sampling Stations	Site-Specific Distribution Coefficient (mg/kg (dw))/(mg/L))	Literature Distribution Coefficient^a (mg/kg(dw))/(mg/L))
Arsenic	2	9,100	31
Cadmium	3	3,750	4,300
Copper	3	50,000	10,000
Lead	3	30,000	900
Manganese	3	18,000	1,000
Nickel	3	17,000	1,900
Silver	2	880	1,100
Zinc	3	7,900	500

Note: ^a - All literature values obtained from U.S. EPA (1998) with the exception of manganese where the number was obtained from IAEA (1994).
- Based on 3 replicate samples at each station.

It should be noted that there is some uncertainty in applying distribution coefficients based on sediment measurements in Rose Creek to other watersheds. However, applying this methodology to other watersheds is still considered to be reasonable.

2.2.3 Fish Concentrations

Fish flesh samples from slimy sculpin and Arctic grayling were collected and analyzed for metals concentrations during the Aquatic Life Sampling and Testing Program conducted in August 2004. Table 2.2-10 lists the six sampling locations in the Rose Creek and Vangorda Creek watersheds that were selected for use in this assessment. Although sampling station R1 was not identified as a control station in the sampling and testing program report (White Mountain Environmental Consulting 2004), it is located upstream of the confluence of North and South forks of Rose Creek and is considered to be a background station for the purposes of this assessment.

TABLE 2.2-10
FISH SAMPLING STATIONS

ROSE CREEK	
R1	South Fork of Rose Creek immediately upstream of the confluence of North and South Forks of Rose Creek
R2	In the mixing zone downstream of the intersection of Rose Creek and the tailings pond discharge channel
R4	Rose Creek just upstream of the confluence with Anvil Creek
R6	Anvil Creek just upstream of the confluence with Rose Creek (control site)
VANGORDA CREEK	
V8	Lower Vangorda Creek below the town access road
B1	Blind Creek near the lower bridge (control site)

A summary of COPC concentrations in fish tissue (Arctic grayling and slimy sculpin) collected in Rose Creek watershed is given in Table 2.2-11 and a similar summary for Vangorda Creek watershed is given in Table 2.2-12. The Yukon First Nations Study (Receveur *et al.* 1998) does not provide any estimates of consumption of fish organs (heart, kidney and lungs), additionally the survey did not indicate that any percent of the population consumed Arctic Grayling organs; therefore, only fish flesh concentrations were used in the assessment.

A comparison of these two tables indicates that the concentrations of:

- many COPC are found to be consistently higher in slimy sculpin than in Arctic grayling. These include arsenic, lead, manganese, and zinc.
- nickel in Arctic grayling are all below the laboratory MDL for both upstream and downstream stations in Rose Creek and Vangorda Creek.
- COPC in Arctic grayling sampled in the downstream stations are not consistently higher or lower than the upstream stations. However, COPC concentrations in slimy sculpin are higher in downstream locations than upstream locations.
- COPC in Arctic grayling in Rose Creek are similar to those measured in Arctic grayling in Vangorda Creek.
- COPC in slimy sculpin in Rose Creek are higher than those measured in slimy sculpin found in Vangorda Creek.

TABLE 2.2-11
SUMMARY OF COPC CONCENTRATIONS IN FISH TISSUE – ROSE CREEK

COPC	Units	Upstream Stations					Downstream Stations				
		No. of obs.	No. of obs. <MDL	Minimum	Maximum	Mean	No. of obs.	No. of obs. <MDL	Minimum	Maximum	Mean
Arctic Grayling - Rose Creek											
Arsenic	µg/g (ww)	10	6	0.05	0.13	0.079	8	3	0.05	0.14	0.099
Cadmium	µg/g (ww)	10	5	0.0025	0.03	0.0098	8	3	0.0025	0.042	0.012
Copper	µg/g (ww)	10	0	0.58	1	0.73	8	0	0.59	1.5	0.82
Lead	µg/g (ww)	10	9	0.025	0.062	0.029	8	6	0.025	0.068	0.034
Manganese	µg/g (ww)	10	10	1	1	1	8	7	1	4	1.38
Nickel	µg/g (ww)	10	10	0.1	0.1	0.1	8	8	0.1	0.1	0.1
Silver	µg/g (ww)	10	0	0.053	0.22	0.12	8	0	0.052	0.16	0.081
Tin	µg/g (ww)	10	0	0.69	0.9	0.83	8	0	0.79	0.88	0.84
Zinc	µg/g (ww)	10	0	6.84	11.8	8.8	8	0	6.29	13.6	8.4
Slimy Sculpin - Rose Creek											
Arsenic	µg/g (ww)	9	2	0.05	0.16	0.11	6	0	0.17	0.25	0.19
Cadmium	µg/g (ww)	9	1	0.0025	0.077	0.038	6	0	0.016	0.077	0.053
Copper	µg/g (ww)	9	2	0.25	1.1	0.7	6	0	0.85	1.6	1.16
Lead	µg/g (ww)	9	0	0.058	1.41	0.28	6	0	0.19	0.31	0.24
Manganese	µg/g (ww)	9	0	9.8	57.2	29.3	6	0	17	66.5	37.5
Nickel	µg/g (ww)	9	9	0.1	0.1	0.1	6	4	0.1	0.27	0.16
Silver	µg/g (ww)	9	9	0.025	0.025	0.025	6	5	0.025	0.078	0.034
Tin	µg/g (ww)	9	0	0.76	0.87	0.81	6	0	0.83	0.88	0.85
Zinc	µg/g (ww)	9	0	30.5	75.8	47.7	6	0	31	57.6	42.4

Notes: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.

Upstream stations – R1 and R6.

Downstream stations – R2 and R4.

TABLE 2.2-12
SUMMARY OF COPC CONCENTRATIONS IN FISH TISSUE – VANGORDA CREEK

COPC	Units	Upstream Stations					Downstream Stations				
		No. of obs.	No. of obs. <MDL	Minimum	Maximum	Mean	No. of obs.	No. of obs. <MDL	Minimum	Maximum	Mean
Arctic Grayling - Vangorda Creek											
Arsenic	µg/g (ww)	5	1	0.05	0.13	0.11	5	3	0.05	0.14	0.082
Cadmium	µg/g (ww)	5	1	0.0025	0.022	0.012	5	0	0.02	0.056	0.033
Copper	µg/g (ww)	5	2	0.25	0.63	0.44	5	3	0.25	0.88	0.44
Lead	µg/g (ww)	5	5	0.025	0.025	0.025	5	3	0.025	0.083	0.043
Manganese	µg/g (ww)	5	5	1	1	1	5	5	1	1	1
Nickel	µg/g (ww)	5	5	0.1	0.1	0.1	5	5	0.1	0.1	0.1
Silver	µg/g (ww)	5	2	0.025	0.15	0.082	5	0	0.056	0.12	0.089
Tin	µg/g (ww)	5	0	0.82	0.9	0.86	5	0	0.81	0.88	0.85
Zinc	µg/g (ww)	5	0	6.02	7.05	6.5	5	0	6.1	11.6	8.1
Slimy Sculpin - Vangorda Creek											
Arsenic	µg/g (ww)	3	1	0.1	0.16	0.12	5	0	0.15	0.24	0.19
Cadmium	µg/g (ww)	3	0	0.077	0.164	0.11	5	0	0.13	0.25	0.18
Copper	µg/g (ww)	3	0	0.62	1.3	0.87	5	0	0.66	0.87	0.79
Lead	µg/g (ww)	3	1	0.025	0.12	0.07	5	0	0.085	0.21	0.16
Manganese	µg/g (ww)	3	0	7.1	12	9.2	5	0	4.6	9.2	6.7
Nickel	µg/g (ww)	3	3	0.1	0.25	0.15	5	5	0.1	0.1	0.1
Silver	µg/g (ww)	3	3	0.025	0.05	0.033	5	5	0.025	0.025	0.025
Tin	µg/g (ww)	3	0	0.7	1.6	1.01	5	0	0.7	0.77	0.74
Zinc	µg/g (ww)	3	0	22	42.9	31.3	5	0	50.8	58.2	55.1

Notes: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.

Upstream station – B1.

Downstream station – V8.

2.2.3.1 Development of Site-Specific Fish Transfer Factors

In order to calculate fish flesh concentrations in Anvil Creek and the Pelly River as well as concentrations in all waterbodies for future conditions, it was necessary to develop transfer factors to calculate fish tissue concentrations from water concentrations. Therefore, site-specific water-to-fish transfer factors were developed for the COPC.

Water quality data measured at and adjacent to sampling locations R1, R2, R4, R6 and V8 were summarized and matched with the fish data measured at the same location. Water quality monitoring stations X2 and X3 were summarized with station R1 and stations X10 and X14 were summarized with station R2. No water quality data are available for station B1. For each site, the average COPC concentrations in fish samples were divided by the corresponding average water concentrations to obtain an estimate of the water-to-fish transfer factors for every COPC. If there were less than three water or fish samples with concentrations above MDL for a

sampling location, then the water-to-fish transfer factor for this COPC was not calculated at this particular location.

The estimated values were then summarized by fish type. The mean values were used as the site-specific water-to-fish transfer factors for Anvil Range mine site were based on at last 8 to 10 samples and are considered adequate. These values are presented in Table 2.2-13. Values derived from literature values are provided for perspective. As discussed previously, in risk assessments it is always better to use site-specific transfer factors than those derived from the literature.

TABLE 2.2-13
SITE-SPECIFIC WATER-TO-FISH TISSUE TRANSFER FACTORS
FOR ANVIL RANGE MINE COMPLEX

COPC	Mean Water-to-Fish TF (L/kg (ww))		Site-Specific Water-to-Fish TF (L/kg(ww))	Literature Water-to-Fish TF (L/kg(ww))	Reference
	Arctic Grayling	Slimy Sculpin			
Arsenic	54	70	62	1,000	CSA 1987
Cadmium	79	351	215	200	NCRP 1986
Copper	634	730	682	200	IAEA 1994, NCRP 1996
Lead	n/a	68	68	300	IAEA 1994, NCRP 1996
Manganese	n/a	196	196	400	IAEA 1994
Nickel	n/a	48	48	310	U.S. EPA 1998
Silver	346	n/a	346	10	NCRP 1996, CSA 1987
Tin	124	116	120	3,000	IAEA 1994
Zinc	310	1841	1075	1,000	IAEA 1994

Note: n/a – not enough samples with concentration above MDL for the calculation.

- Based on 3 samples at least 3 sample locations.

As noted in the sediment discussion, there are uncertainties in applying this methodology. However, the use of the site-specific transfer factors for fish are still a reasonable estimate of the COPC concentrations in fish tissue.

2.2.4 Benthic Invertebrates

Laberge Environmental (2003) have carried out benthic invertebrate sampling in Rose Creek, Anvil Creek and Vangorda Creek as part of their annual biological monitoring program. The benthic invertebrates are classified and enumerated; however, no metal analyses were carried out

on the samples. In general, it is reported that the benthic communities in these three watersheds are healthy and do not seem to be influenced by high metal concentrations in the sediments.

The Selkirk First Nations report provides results on metal analyses for Anvil Creek and the Pelly River. Table 2.2-14 provides a summary of the data. As seen from the table, mean concentrations of manganese and zinc in benthic organisms are higher in Anvil Creek than in benthic organisms in Pelly River. All other COPC concentrations in benthic organisms are higher in Pelly River. Literature derived transfer factors as described in Appendix E were used to obtain COPC concentrations in benthic organisms.

TABLE 2.2-14
SUMMARY OF COPC CONCENTRATIONS IN BENTHIC INVERTEBRATES IN
ANVIL CREEK AND PELLY RIVER

COPC	Mean Concentration (µg/g wet wt.) Anvil Creek	Mean Concentration (µg/g wet wt.) Pelly River
Arsenic	0.14	0.2
Cadmium	0.14	0.39
Copper	2.14	3.42
Lead	1.99	5.07
Manganese	46.03	17.52
Nickel	0.32	0.72
Silver	0.01	0.03
Tin	1.09	3.89
Zinc	48.10	42.77

2.3 TERRESTRIAL ENVIRONMENT

In the 2004 Terrestrial Effects Study for the Anvil Range Mine Complex (Gartner Lee Limited 2005b), soil and terrestrial vegetation samples were collected at locations around the Faro mine site and Vangorda Plateau mine site. Samples were also collected at control locations around the Swim Lake basin area. Data from a 2002 study (C.E. Jones & Associates Ltd. 2003) were also included in this assessment.

2.3.1 Soil Data

Soil data were provided by Gartner Lee Limited (Gartner Lee 2005). Both surface and subsurface samples were collected in affected area (around the Faro mine site and Vangorda

Plateau mine site), as well as reference sites (Swim Lakes area). Only the samples classified as “Surface Organic” and “Surface Mineral” were considered in this assessment.

Table 2.3-1 summarizes the concentrations of COPC in soil samples from the reference and affected areas.

TABLE 2.3-1
SUMMARY OF COPC CONCENTRATIONS IN SOIL FOR BACKGROUND AND
AFFECTED AREAS ON ANVIL RANGE MINE COMPLEX

COPC	Units	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Background						
Arsenic	mg/kg dw	19	0	0.4	0.73	1.4
Cadmium	mg/kg dw	19	3	0.25	1.76	9.7
Copper	mg/kg dw	19	0	3	10.6	29
Lead	mg/kg dw	19	1	2.5	9.9	17.5
Manganese	mg/kg dw	19	0	66	628	4390
Nickel	mg/kg dw	19	8	1	3.53	13
Silver	mg/kg dw	19	18	1	1.05	2
Tin	mg/kg dw	19	19	2.5	2.5	2.5
Zinc	mg/kg dw	19	0	30	118	480
Affected Areas						
Arsenic	mg/kg dw	59	0	0.5	8.7	64.8
Cadmium	mg/kg dw	59	9	0.25	1.81	12.4
Copper	mg/kg dw	59	0	5	39.6	272
Lead	mg/kg dw	59	0	5	588	5930
Manganese	mg/kg dw	59	0	37	487	4360
Nickel	mg/kg dw	59	4	1	8.7	55
Silver	mg/kg dw	59	54	1	1.19	6
Tin	mg/kg dw	59	49	2.5	3.14	8
Zinc	mg/kg dw	59	0	47	496	3050

Notes: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.

As seen from Table 2.3-1, in general, the soil concentrations in affected area are higher than the reference sites for most COPC. Since the Anvil Range Mining Complex produced lead and zinc concentrates, the affected area is expected to have substantially higher lead and zinc levels in soil when compared to the reference sites. This is seen in Table 2.3-1.

For the purpose of ecological risk assessment, receptors were assumed to be present in different area in the mining complex. These receptor locations were defined based on home range of the species and the spatial distribution of lead and zinc concentrations in soil. A detailed discussion

of the receptors selected for the assessment, their home ranges and diets and the areas where the species were assumed to be present in the study area is presented in Section 3.1. A brief discussion of the species home ranges is provided below for the purpose of identifying the basis used to characterize soil and vegetation levels across the study area.

For small local mammals such as hares and marmots and terrestrial birds such as grouse, the site was divided up into five smaller locations since these animals have a small home range. These locations have been defined as follows: Background (around Swim Lake), Van-S (around Grum Mine Site), Faro-S (around Faro Mine Site), Faro-N (north of Faro-S) and Faro-W (west of Faro-S). The background area includes a couple of samples that were not originally classified as reference sites. Figure 2.3-1 shows the locations of these areas.

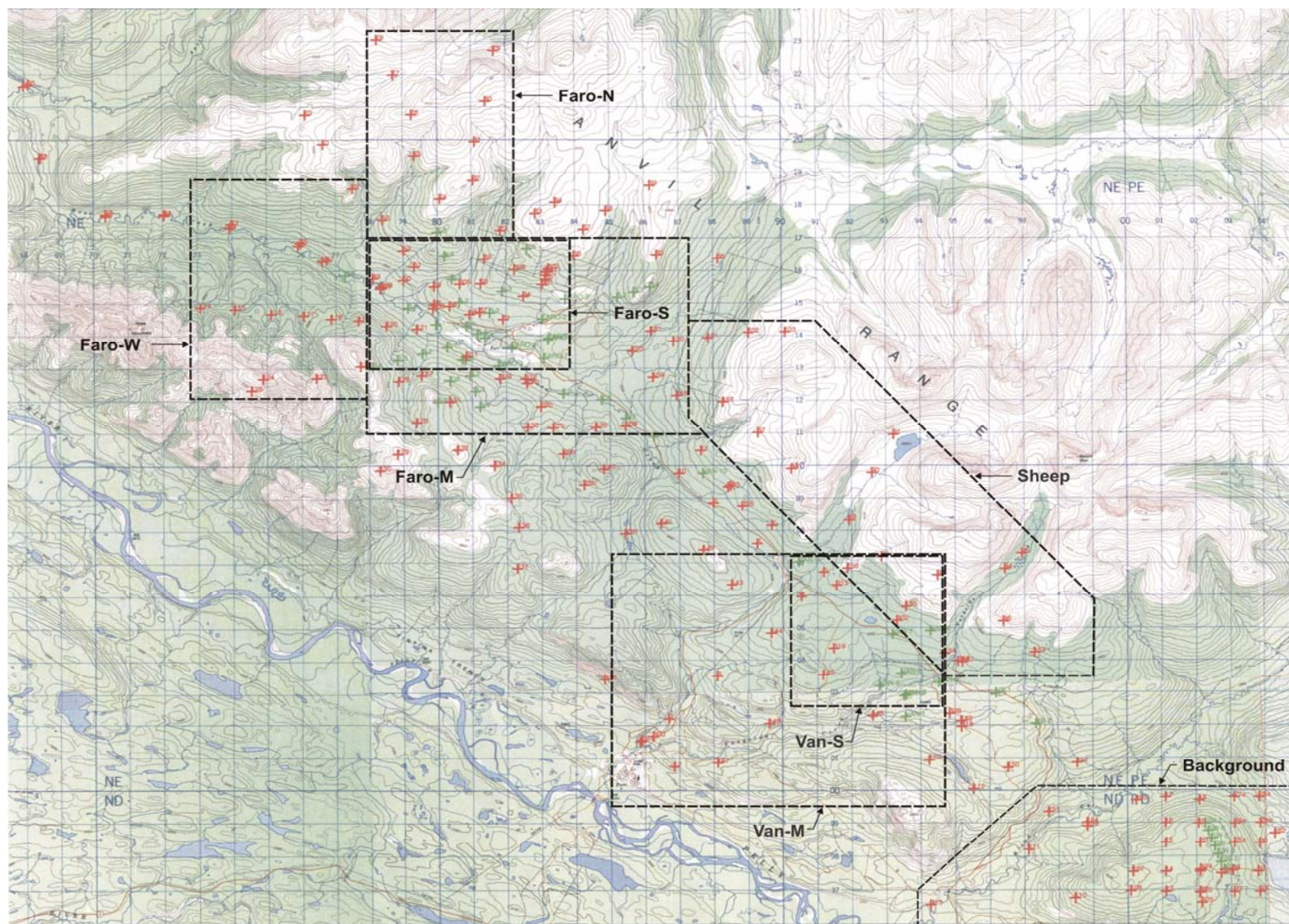
Slightly larger areas are defined for mammals such as bear and fox which have a larger home range. These are defined as: Van-M (a larger area around Grum Mine Site which includes Van-S), Faro-M (a larger area around Faro Mine Site which includes Faro-S) and Background (same as the background used for small local mammals). The risk for Fannin sheep was considered within the sheep area which includes the Mount Mye area, which is the area where Fannin sheep are located, as well as the Vangorda/Grum site through which sheep travel.

For mammals with a very large home range such as caribou, moose and wolf, it was assumed that they would be present across the entire site (i.e. the Faro and Vangorda/Grum site) and an overall concentration of COPC across this area was used.

The concentrations of each COPC in soils at the various receptor locations that were considered in the assessment are summarized in Table 2.3-2. Samples collected from each of the eight defined terrestrial areas (Background, Faro-S, Faro-N, Faro-W, Faro-M, Van-S, Van-M and Sheep) were evaluated and the 95% upper confidence limits (UCLs) of the mean values were estimated for all metals (excepting thallium) for input to the risk assessment. Thallium concentrations were not measured in the soil samples.

The COPC concentrations are generally highest in Faro-S, providing a worst-case scenario, and lowest in background. When comparing COPC concentrations in soil measured around the Faro site and the Vangorda/Grum site, higher concentrations of manganese, nickel and tin concentrations are found in areas around the Vangorda/Grum site and higher mean concentrations for copper, lead, and zinc are found around the Faro site.

FIGURE 2.3-1
SOIL SAMPLING LOCATIONS



There is only one sample from the Mount Mye area and the COPC concentrations are generally lower or close to the background level.

TABLE 2.3-2
SUMMARY OF COPC CONCENTRATIONS IN SOIL USED IN THE ASSESSMENT

COPC	95% UCL of Mean (mg/kg dw)								
	Background	Van-S	Van-M	Faro-N	Faro-S	Faro-W	Faro-M	Sheep	Overall
Arsenic	1.9	14.0	8.8	4.4	20.2	20.3	14.7	0.5	8.6
Cadmium	2.47	1.30	1.79	4.29	2.65	1.91	2.15	0.6	2.16
Copper	14.5	35.0	26.1	31.7	99.8	57.5	73.1	6.0	39.7
Lead	11.5	247.5	146.2	229.0	2013.1	916.4	1398.2	18.0	604.2
Manganese	1001	1384	1292	411	367	535	733	665	664
Nickel	6.67	24.03	17.64	5.95	13.39	11.45	13.34	1.00	9.15
Silver	1.13	1.00	1.00	1.00	2.36	1.00	1.86	1.00	1.28
Tin	2.50	7.81	5.02	4.07	3.14	3.86	3.58	7.00	3.24
Zinc	159.7	449.7	327.1	246.8	1234.2	734.9	942.3	169.0	492.8

2.3.2 Terrestrial Vegetation Data

Vegetation samples were collected in 2002 and 2004. Forbs, grasses, horsetails and Labrador tea, berries, willow, tree sap, bear root, mushroom and lichen samples were collected in affected areas and reference sites (Swim Lake basin). Only arsenic, cadmium, chromium, copper, lead, mercury, selenium, silver and zinc were analyzed on samples collected in the 2002 sampling program.

Table 2.3-3 summarizes COPC concentrations for each vegetation type in both the background and affected areas. Mean lead and zinc concentrations in samples from the affected areas are consistently higher than background samples with the exception of horsetail, in which a higher zinc concentration is found in the single background sample.

Forage, browse, berries and lichen are consumed by wildlife in the area. In the ecological risk assessment, forbs, grass, horsetail and Labrador tea were grouped as forage and willow as browse and their concentrations are summarized for each receptor locations as defined in Section 2.3.1. Table 2.3-4 presents the concentrations in berries, browse and forage at each area. Dry weight concentrations reported by the laboratory are converted to fresh rate based on the reported sample moisture content. However, moisture content was only reported in the 2004 data and not in the 2002 data. Average moisture content by each species was estimated using 2004 data and applied to the 2002 data. A moisture content of 40% was assumed for lichen.

Mean lead and zinc concentration are highest in Faro-S for all three vegetation types with the exception of zinc in forage, which is consistent with the soil data. Mean concentrations in berries are found to be highest in Van-M for most of the metals.

TABLE 2.3-3
SUMMARY OF COPC CONCENTRATIONS IN VEGETATION
FROM ANVIL RANGE MINE COMPLEX

COPC	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Berries											
Arsenic	µg/g (dw)	14	14	0.05	0.15	0.5	30	29	0.05	0.17	0.5
Cadmium	µg/g (dw)	14	7	0.01	0.062	0.22	30	10	0.01	0.11	0.56
Copper	µg/g (dw)	14	0	2	3.4	5.2	30	0	2.2	5.1	10.1
Lead	µg/g (dw)	14	13	0.05	0.082	0.2	30	13	0.05	0.74	4
Manganese	µg/g (dw)	11	0	5.3	97	384	22	0	5.2	65.4	253
Nickel	µg/g (dw)	14	4	0.05	0.39	1.4	30	2	0.05	0.94	5.2
Silver	µg/g (dw)	14	9	0.005	0.013	0.1	30	23	0.005	0.011	0.07
Thallium	µg/g (dw)	11	11	0.01	0.01	0.01	22	22	0.01	0.01	0.01
Tin	µg/g (dw)	11	10	0.05	0.064	0.2	22	20	0.05	0.14	1.7
Zinc	µg/g (dw)	14	0	3.1	10.8	23	30	0	5	16.2	43
Forb											
Arsenic	µg/g (dw)	3	2	0.05	0.1	0.2	7	6	0.05	0.057	0.1
Cadmium	µg/g (dw)	3	0	0.03	0.51	1.03	7	0	0.16	0.46	0.71
Copper	µg/g (dw)	3	0	4	6.5	9.9	7	0	6.3	8.3	11.7
Lead	µg/g (dw)	3	1	0.05	0.12	0.2	7	0	0.2	0.97	4.3
Manganese	µg/g (dw)	3	0	90.6	272	617	7	0	111	225	312
Nickel	µg/g (dw)	3	0	0.5	1.43	2.4	7	0	0.9	8.1	21.6
Silver	µg/g (dw)	3	2	0.005	0.0067	0.01	7	4	0.005	0.0086	0.02
Thallium	µg/g (dw)	3	3	0.01	0.01	0.01	7	7	0.01	0.01	0.01
Tin	µg/g (dw)	3	0	0.1	0.3	0.6	7	2	0.05	0.11	0.2
Zinc	µg/g (dw)	3	0	19.7	32.7	46.8	7	0	24.3	124	648
Grass											
Arsenic	µg/g (dw)	3	2	0.05	0.1	0.2	38	33	0.05	0.45	3
Cadmium	µg/g (dw)	3	0	0.02	0.18	0.48	38	8	0.01	0.13	0.46
Copper	µg/g (dw)	3	0	2.1	5.2	9.9	38	0	1.99	3.54	6.4
Lead	µg/g (dw)	3	1	0.05	0.15	0.3	38	4	0.05	8.5	85.5
Manganese	µg/g (dw)	3	0	31.9	180	254	12	0	35.3	569	1820
Nickel	µg/g (dw)	3	0	0.3	1	1.4	38	0	0.3	1.32	3.6
Silver	µg/g (dw)	3	2	0.005	0.0067	0.01	38	20	0.005	0.031	0.34
Thallium	µg/g (dw)	3	3	0.01	0.01	0.01	12	11	0.01	0.015	0.07
Tin	µg/g (dw)	3	1	0.05	0.52	1.3	12	7	0.05	0.11	0.4
Zinc	µg/g (dw)	3	0	12.5	71	179	38	0	10	97.7	1040
Horsetail											
Arsenic	µg/g (dw)	1	0	0.4	0.4	0.4	9	4	0.05	0.16	0.4
Cadmium	µg/g (dw)	1	0	1.53	1.53	1.53	9	0	0.12	0.45	0.89
Copper	µg/g (dw)	1	0	6.5	6.5	6.5	9	0	4.6	5.7	7.2
Lead	µg/g (dw)	1	1	0.05	0.05	0.05	9	0	0.2	1.03	2.7
Manganese	µg/g (dw)	1	0	69.7	69.7	69.7	9	0	52.7	129	286
Nickel	µg/g (dw)	1	0	0.3	0.3	0.3	9	0	0.3	0.53	1.2
Silver	µg/g (dw)	1	0	0.04	0.04	0.04	9	0	0.01	0.023	0.07
Thallium	µg/g (dw)	1	1	0.01	0.01	0.01	9	7	0.01	0.02	0.08
Tin	µg/g (dw)	1	0	0.2	0.2	0.2	9	2	0.05	0.17	0.4
Zinc	µg/g (dw)	1	0	75.9	75.9	75.9	9	0	28.3	39.8	61.9

TABLE 2.3-3 (Cont'd)
SUMMARY OF COPC CONCENTRATIONS IN VEGETATION
FROM ANVIL RANGE MINE COMPLEX

COPC	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Labrador Tea											
Arsenic	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Cadmium	µg/g (dw)	3	3	0.01	0.01	0.01	7	4	0.01	0.016	0.03
Copper	µg/g (dw)	3	0	2.4	3.63	5.2	7	0	2.6	4.37	6.5
Lead	µg/g (dw)	3	3	0.05	0.05	0.05	7	0	0.2	0.77	2.6
Manganese	µg/g (dw)	3	0	48.1	539	1180	7	0	126	412	678
Nickel	µg/g (dw)	3	2	0.05	0.13	0.3	7	1	0.05	0.36	1.1
Silver	µg/g (dw)	3	2	0.005	0.01	0.02	7	6	0.005	0.0057	0.01
Thallium	µg/g (dw)	3	3	0.01	0.01	0.01	7	4	0.01	0.05	0.18
Tin	µg/g (dw)	3	3	0.05	0.05	0.05	7	6	0.05	0.071	0.2
Zinc	µg/g (dw)	3	0	24.2	24.7	25.3	7	0	15.4	28.7	43
Lichen											
Arsenic	µg/g (dw)	18	15	0.05	0.21	0.5	152	21	0.05	1.1	24
Cadmium	µg/g (dw)	18	2	0.01	0.081	0.28	152	2	0.01	0.24	2.52
Copper	µg/g (dw)	18	0	0.6	0.97	1.3	152	0	0.7	3.56	35.4
Lead	µg/g (dw)	18	0	0.4	1.14	1.6	152	0	0.6	60.4	747.7
Manganese	µg/g (dw)	12	0	13	93.5	253	120	0	16.8	81.1	417
Nickel	µg/g (dw)	18	4	0.05	0.22	0.5	152	0	0.2	0.62	4.6
Silver	µg/g (dw)	18	8	0.005	0.016	0.05	152	9	0.005	0.16	1.83
Thallium	µg/g (dw)	12	12	0.01	0.01	0.01	120	75	0.01	0.059	1.52
Tin	µg/g (dw)	12	10	0.05	0.075	0.3	120	84	0.05	0.47	35.1
Zinc	µg/g (dw)	18	0	10.7	18.2	29.7	152	0	12.3	93.7	1043
Mushroom											
Arsenic	µg/g (dw)	No background samples available					10	0	0.2	0.97	3.9
Cadmium	µg/g (dw)						10	0	0.18	1.91	5.82
Copper	µg/g (dw)						10	0	10.1	40	141
Lead	µg/g (dw)						10	0	0.4	20.7	120
Manganese	µg/g (dw)						10	0	6.4	29.9	120
Nickel	µg/g (dw)						10	0	0.2	0.83	2.2
Silver	µg/g (dw)						10	0	0.63	3.64	25.8
Thallium	µg/g (dw)						10	8	0.01	0.015	0.05
Tin	µg/g (dw)						10	5	0.05	0.39	1.5
Zinc	µg/g (dw)						10	0	59	98	202
Roots											
Arsenic	µg/g (dw)	No background samples available					10	0	0.1	1.56	3.2
Cadmium	µg/g (dw)						10	0	0.04	0.18	0.32
Copper	µg/g (dw)						10	0	2.7	11	17.2
Lead	µg/g (dw)						10	0	0.4	20.9	74.6
Manganese	µg/g (dw)						10	0	51.5	83.2	124
Nickel	µg/g (dw)						10	0	0.7	9.2	14.3
Silver	µg/g (dw)						10	7	0.005	0.032	0.11
Thallium	µg/g (dw)						10	5	0.01	0.034	0.09
Tin	µg/g (dw)						10	5	0.05	0.25	1
Zinc	µg/g (dw)						10	0	18.6	42.7	130

TABLE 2.3-3 (Cont'd)
SUMMARY OF COPC CONCENTRATIONS IN VEGETATION
FROM ANVIL RANGE MINE COMPLEX

COPC	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Sap											
Arsenic	µg/g (dw)	3	3	0.01	0.01	0.01	7	3	0.01	0.06	0.21
Cadmium	µg/g (dw)	3	0	0.007	0.15	0.22	7	0	0.004	0.027	0.071
Copper	µg/g (dw)	3	0	0.52	0.75	0.86	7	0	0.42	1.28	2.95
Lead	µg/g (dw)	3	1	0.01	0.057	0.11	7	0	0.05	6.1	24.6
Manganese	µg/g (dw)	3	0	15.8	27.6	49.6	7	0	3.84	18.2	50
Nickel	µg/g (dw)	3	1	0.01	0.017	0.02	7	1	0.01	0.079	0.19
Silver	µg/g (dw)	3	3	0.001	0.001	0.001	7	5	0.001	0.0054	0.023
Thallium	µg/g (dw)	3	3	0.002	0.002	0.002	7	3	0.002	0.0063	0.012
Tin	µg/g (dw)	3	0	0.54	0.68	0.78	7	0	0.31	1.34	3.27
Zinc	µg/g (dw)	3	0	1.6	3.53	4.8	7	0	1.1	9.3	27.7
Willow											
Arsenic	µg/g (dw)	10	9	0.05	0.37	0.5	55	46	0.05	0.78	11
Cadmium	µg/g (dw)	10	0	1.16	3.86	8.23	55	0	0.31	3.42	17.3
Copper	µg/g (dw)	10	0	2.5	3.53	6	55	0	2.07	5.1	10.94
Lead	µg/g (dw)	10	4	0.05	0.21	0.5	55	0	0.1	8.5	115
Manganese	µg/g (dw)	3	0	63	330	804	7	0	71.8	405	908
Nickel	µg/g (dw)	10	0	0.2	0.94	2.9	55	0	0.4	3.29	17.4
Silver	µg/g (dw)	10	8	0.005	0.008	0.03	55	14	0.005	0.041	0.22
Thallium	µg/g (dw)	3	3	0.01	0.01	0.01	7	7	0.01	0.01	0.01
Tin	µg/g (dw)	3	3	0.05	0.05	0.05	7	5	0.05	0.11	0.3
Zinc	µg/g (dw)	10	0	27	186	396	55	0	42.7	301	2350

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.

There were no manganese, thallium or tin analyses on browse samples in areas Van-S, Van-M, Faro-N and Faro-S. Therefore, site-specific soil-to-browse transfer factors for manganese and tin were developed to estimate these concentrations as described in the next section.

TABLE 2.3-4
SUMMARY OF COPC CONCENTRATIONS IN VEGETATION
BY RECEPTOR LOCATIONS

COPC	95% UCL of Mean (µg/g ww)								
	Background	Van-S	Van-M	Faro-N	Faro-S	Faro-W	Faro-M	Sheep	Overall
Berries									
Arsenic	0.041	0.146	0.058	0.007	0.089	0.010	0.070	0.008	0.040
Cadmium	0.018	0.055	0.019	0.021	0.034	0.096	0.029	0.015	0.022
Copper	0.71	1.58	1.45	2.05	1.10	1.59	1.04	0.97	0.92
Lead	0.019	0.258	0.098	0.212	0.655	0.105	0.556	0.008	0.138
Manganese	28.9	8.7	17.8	89.6	22.7	41.4	20.7	14.5	18.5
Nickel	0.114	0.237	0.491	0.165	0.135	0.905	0.150	0.139	0.203
Silver	0.004	0.007	0.004	0.013	0.001	0.011	0.001	0.001	0.003
Thallium	0.002	0.002	0.003	0.001	0.002	0.002	0.002	0.002	0.002
Tin	0.016	0.009	0.017	0.822	0.078	0.010	0.041	0.008	0.030
Zinc	2.50	3.93	4.46	2.16	6.49	6.61	5.46	2.36	3.14
Browse (Willow)									
Arsenic	0.18	0.19	0.19	0.19	0.79	0.25	0.57	0.25	0.39
Cadmium	2.05	1.57	4.18	0.28	1.81	2.28	1.71	0.80	1.65
Copper	1.79	2.32	2.88	1.76	2.47	2.25	2.28	2.84	2.05
Lead	0.11	1.03	0.85	5.52	10.25	0.49	6.95	0.29	4.25
Manganese	308	.	.	.	.	397	1202	756	240
Nickel	1.19	1.39	1.62	0.23	1.57	2.37	1.46	1.65	1.37
Silver	0.005	0.042	0.033	0.004	0.032	0.017	0.024	0.025	0.018
Thallium	0.004	.	.	.	.	0.006	0.005	0.005	0.004
Tin	0.093	.	.	.	.	0.029	0.234	0.026	0.052
Zinc	97.4	65.1	139	73.5	251	200	188	156	140
Forage (Grass, Forb, Horsetail, Lab tea)									
Arsenic	0.042	0.197	0.186	0.025	0.308	0.101	0.254	0.094	0.125
Cadmium	0.134	0.074	0.066	0.168	0.086	0.121	0.074	0.031	0.070
Copper	1.73	1.49	1.56	1.78	1.75	1.68	1.52	1.97	1.52
Lead	0.034	1.45	1.28	0.24	10.80	0.78	7.73	0.11	2.72
Manganese	209	195	478	224	148	410	264	168	165
Nickel	0.29	0.83	0.75	0.76	0.55	2.63	0.53	0.90	0.60
Silver	0.005	0.017	0.015	0.015	0.016	0.061	0.012	0.005	0.011
Thallium	0.004	0.005	0.007	0.004	0.044	0.003	0.036	0.017	0.011
Tin	0.110	0.023	0.035	0.079	0.023	0.081	0.026	0.069	0.053
Zinc	17.7	160	139	24.6	56.6	30.4	44.9	14.1	34.2
Lichen									
Arsenic	0.15	0.69	0.52	0.35	3.27	0.88	1.95	0.32	0.77
Cadmium	0.25	0.09	0.10	0.24	0.33	0.14	0.24	0.09	0.16
Copper	0.71	1.83	1.49	1.66	7.82	2.58	5.09	0.98	2.32
Lead	0.9	16.9	12.8	23.6	171.8	51.7	109.1	5.8	40.7
Manganese	65.8	63.1	67.9	45.3	33.8	98.5	34.6	68.5	54.6
Nickel	0.206	0.755	0.590	0.317	0.646	0.408	0.500	0.261	0.386
Silver	0.031	0.056	0.053	0.077	0.368	0.125	0.239	0.035	0.103
Thallium	0.006	0.016	0.012	0.101	0.274	0.048	0.137	0.031	0.046
Tin	0.86	0.14	0.11	0.15	0.16	3.09	0.12	0.10	0.53
Zinc	12.1	38.0	30.5	49.7	219	70.7	143	20.0	61.4

2.3.2.1 Site Specific Soil to Browse Transfer Factors

There were no browse samples for some of the COPCs (manganese, thallium and tin) in Van-S, Van-M, Faro-N and Faro-S. Therefore, Site-specific soil-to-browse transfer factors were developed using measured browse concentrations and measured soil concentrations. Since thallium concentrations in soil were not available, the thallium concentration in browse in Van-S, Van-M, Faro-N and Faro-S were assumed to be the same as Faro-W, the area with the highest concentrations in all areas with data (Background, Faro-W, Faro-M, Sheep).

The site-specific soil-to-browse transfer factors were developed for the manganese and tin using soil and willow samples collected in affected area from the 2004 sampling program. Soil data measured at sampling locations with willow samples collected were summarized and matched with the willow data measured at the same location. For each site, the average metal concentrations in the willow sample were divided by the corresponding soil concentrations to obtain an estimate of the soil-to-browse transfer factors for manganese and tin.

The estimated values were then summarized and the mean values (as shown in Table 2.3-5) were used as the site-specific soil-to-browse transfer factors for Anvil Range mine site. Values derived from the literature are also provided as a perspective.

**TABLE 2.3-5
SITE-SPECIFIC SOIL-TO-BROWSE TRANSFER FACTORS
USED IN ASSESSMENT FOR ANVIL RANGE MINE COMPLEX**

COPC	Site-Specific Soil-to-Browse Transfer Factor ((mg/kg browse)/(mg/kg soil))	Literature Values ((mg/kg browse)/(mg/kg soil))	Reference
Arsenic	0.012	0.008	NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998
Cadmium	0.55	0.019	U.S. EPA 1998
Copper	0.14	0.055	NCRP 1996, Baes <i>et al.</i> 1984
Lead	0.0016	0.005	NCRP 1996, Baes <i>et al.</i> 1984
Manganese	0.22	0.29	U.S. NRC 1992
Nickel	0.43	0.009	NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998
Silver	0.0074	0.03	U.S. EPA 1998
Tin	0.02	0.03	Baes <i>et al.</i> 1984
Zinc	0.356	0.27	NCRP 1996, IAEA 1994, Baes <i>et al.</i> 1984

2.3.3 Large Mammal Data

Gartner Lee provided analytical data on 4 caribou and 3 moose that were captured in the study area. Table 2.3-6 provides a summary of the maximum measured concentrations. The muscle concentrations were used in the risk assessment and the organ concentrations were used in a sensitivity analysis. As seen from the table, COPC concentrations in caribou muscle were generally higher than moose muscle with the exception of cadmium, silver and zinc. For caribou, liver concentrations were generally higher with the exception of zinc. Similarly, in moose liver and kidney concentrations were generally higher with the exception of zinc. Cadmium concentrations in moose kidneys were the highest of all the organs.

TABLE 2.3-6
MAXIMUM MEASURED CONCENTRATIONS OF COPC IN CARIBOU AND MOOSE

COPC	Maximum Measured Concentration (mg/kg ww)				
	Moose			Caribou	
	Liver	Kidney	Muscle	Liver	Muscle
Arsenic	0.002	0.01	0.002	0.01	0.01
Cadmium	5.08	37.86	0.02	2.13	0.01
Copper	20.26	3.71	1.27	22.04	2.51
Lead	0.03	0.03	0.02	0.77	0.03
Manganese	2.26	2.75	0.25	4.58	0.85
Nickel	0.04	0.20	0.01	0.05	0.02
Silver	0.08	0.02	0.11	1.01	0.04
Thallium	0.002	0.002	0.002	0.002	0.002
Tin	0.01	0.001	0.002	0.002	0.01
Zinc	23.91	28.80	79.67	22.23	73.75

3.0 RECEPTOR CHARACTERIZATION

This chapter discusses the rationale behind the selection of ecological and human receptors for the purposes of the assessment from risks of exposure to contaminants of potential concern on the Anvil Range Mine Complex.

3.1 ECOLOGICAL RECEPTORS

The receptor characterization phase involves selection of ecological receptors for inclusion in the risk assessment and identification of their pathways of exposure to the COPC. As it is not practical to assess risks to all ecological species, it is common practice to select representative species based on level of potential exposure, importance as a food source for other species and/or humans, importance for cultural reasons, or because they are endangered or rare species.

Therefore, ecological receptors are generally chosen to capture various levels of exposure via the different types of diets that they consume. They are also selected if they are considered important: (1) in the functioning of the ecosystem; (2) in the production of food for subsistence; or (3) due to their cultural or medicinal significance.

3.1.1 Aquatic Receptors

Figure 3.1 provides a schematic representation of the selected ecological receptors for the aquatic environment. The aquatic species chosen represent a typical food chain that would be found in aquatic systems and are expected to be found in Rose Creek, Anvil Creek, Vangorda Creek and Pelly River.

Primary Producers - Primary producers occupy the lowest level in the food chain. These organisms are generally plants that use the sun and inorganic molecules to produce food.

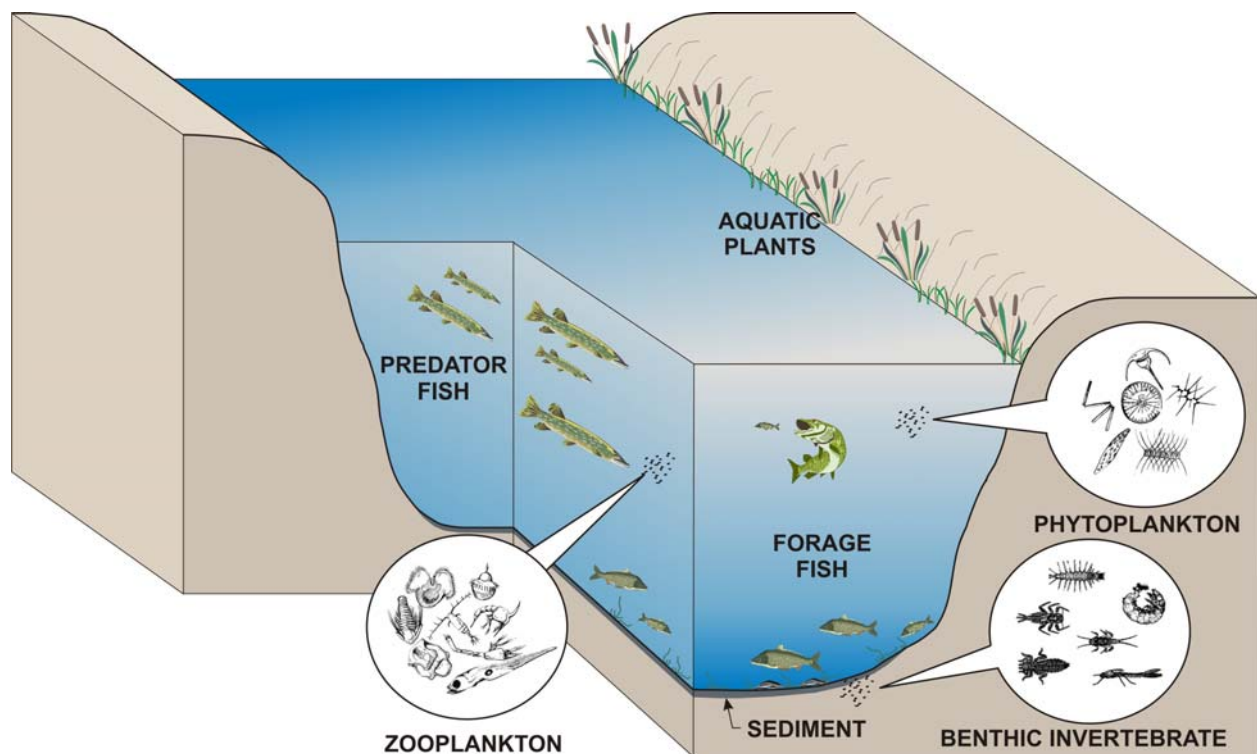
Aquatic plants in most ecosystems usually constitute the majority of the primary producer biomass. Aquatic plants are often consumed by moose, muskrat and other animals, thereby forming a link between aquatic and terrestrial ecosystems. Besides being an important food resource, aquatic plants also provide habitat to aquatic organisms.

Phytoplankton are also part of the first level in the aquatic food chain. Members of the division *Chlorophyta* have been studied extensively and are relatively common in most northern aquatic ecosystems. Even though the overall contribution of *Chlorophyta* to northern aquatic ecosystems is relatively small, they are a primary food resource for grazing zooplankton.

Primary Consumers - Primary consumers occupy the second level in the food chain. These organisms generally eat plant material such as phytoplankton.

Zooplankton such as *Cladocerans* are found in most northern aquatic ecosystems. Although *Cladocerans* may be seasonally quite abundant, their overall contribution to northern aquatic ecosystems is relatively small.

FIGURE 3.1-1
AQUATIC RECEPTORS INCLUDED IN THE ASSESSMENT



Benthic invertebrates both live and feed within sediments and therefore may be exposed to contaminants through ingestion of sediment-bound contaminants and also through exposure to interstitial waters within the sediment. Benthic invertebrates provide a link between aquatic and terrestrial ecosystems. For example, *Chironomidae* (midge) larvae are usually the most abundant benthic invertebrate taxa present in aquatic ecosystems in the northern climate. Many species feed on decaying organic matter and thereby form an important link between the decomposer and primary consumer levels. Furthermore, midge larvae are a main food source for small/juvenile fish and larger omnivorous fish. The adults are capable of flight and are frequently consumed by birds and bats. This life stage provides an important link between aquatic and terrestrial ecosystems in the region.

Secondary Consumers - Ecological receptors at the secondary consumer level include forage fish that feed primarily on benthic invertebrates and smaller individuals, and are an important food source for larger predatory fishes. Examples of forage fish are Arctic grayling and slimy sculpin, which are prevalent in the study area streams.

Tertiary Consumers - Tertiary consumers are found at the top end of the aquatic food chain and consist of larger predatory fish species that consumer other fish species. An example of a predator fish is the Chinook salmon, which is found in some of the study area rivers. Predatory fish are also an important component of the human food chain. Both forage and predatory fish are an important component of the diet of omnivores (e.g., bear, merganser) and carnivores (e.g., eagle).

3.1.2 Terrestrial Receptors

The terrestrial receptors chosen for the assessment of potential impacts from the Anvil Range Mine Complex were obtained from information provided by the First Nations people who use the site as well as various sources that contain information on terrestrial species in the Yukon and site-specific baseline studies for the Anvil Range Mine Complex (Gartner Lee Limited 2002, Gartner Lee *et al.* 2005). The terrestrial species selected for the risk assessment are presented in Table 3.1-1. There are many other ecological species on the Vangorda Plateau that could be selected; however, the species presented in this table cover a range of exposure pathways that encompass the dietary habits of the other species.

TABLE 3.1-1
TERRESTRIAL RECEPTORS CHOSEN FOR
THE ANVIL RANGE MINE ASSESSMENT

Herbivores	Omnivores	Carnivores
Beaver	Black bear	Mink
Woodland Caribou	Ducks (mallard, scaup, merganser)	Wolf
Grouse	Red fox	
Snowshoe hare		
Hoary marmot		
Moose		
Fannin sheep		

Black Bear –While berries, herbs and roots are their primary food source, they also consume fish and are thus potentially exposed via the aquatic pathways as well as terrestrial pathways.

Beaver – The beaver habitat is largely in the aquatic environment, although terrestrial vegetation comprises a significant part of their diet. Beaver are included in this assessment because they have been identified as being consumed by Yukon First Nations people and because they are an indicator of both potential aquatic and terrestrial impacts.

Caribou – Caribou consume predominantly lichen, which are mostly impacted by contaminant deposition from the air. Barren-ground caribou are found to the north and west of the site where as woodland caribou are known to be in the area. Caribou were chosen since they are in the area and represent a portion of the diet of the Yukon First Nations people.

Ducks - Waterfowl can be highly exposed ecological receptors, since their diet is almost entirely obtained from the aquatic environment. The waterfowl diet includes aquatic vegetation, fish, and aquatic (benthic) invertebrates. Three species were selected to take into account differences in the diets of mallard (consumes primarily aquatic plants), merganser (consumes mainly fish) and scaup (consumes mostly benthic invertebrates). Ducks are also part of the human food chain.

Grouse – Grouse (and ptarmigan) are terrestrial birds common in the northern environment. The diets of both species are primarily terrestrial, comprising primarily berries and browse. Grouse were selected to represent both species.

Red Fox - Foxes are predatory species and thus are exposed via food chain effects. They are omnivores and consume a varied diet including berries, ducks and hare.

Snowshoe Hare – The snowshoe hare is chosen as it may be trapped in the area and used as a food source. Browse and forage comprise most of the diet of hare.

Hoary Marmot – The hoary marmot feeds on grass and other green plants. The only aquatic pathway of exposure is from consumption of water. Hoary marmots are protected from being hunted in the Yukon, except by First Nations people.

Mink – Mink are found in the Yukon and consume aquatic plants, benthic invertebrates, ducks and fish and are thus potentially exposed via the aquatic pathways.

Moose – Moose consume aquatic macrophytes and browse and thus are potentially an exposed species. There is very limited aquatic macrophyte growth in Anvil Creek, Rose Creek or Vangorda Creek, thus the likelihood of moose being exposed to COPC downstream of the Anvil Range facilities is reduced. Nonetheless, moose may be exposed to COPC via terrestrial pathways and given that moose are an important source of food to people in the study area, they were included in the assessment.

Fannin Sheep - The Faro herd (approximately 80 in the nursery herd), which migrates directly through the Vangorda Plateau Mine site, are of particular importance and therefore are considered in this assessment. They are also a protected species but are hunted by First Nations people. Their diet consists of terrestrial vegetation (forage).

Wolf - The wolf is a predatory species that consumes a number of other species including caribou, hare and moose. Food chain effects are assessed in this study through the inclusion of the wolf.

All of the terrestrial species mentioned above were assumed to consume soil or sediment, depending on where they obtained their food from, in addition to the food sources noted above. Figure 3.1-2 provides a schematic of the receptors selected for this assessment. The following section discusses the pathways that have been considered in this assessment.

3.1.3 Ecological Pathways

Several different pathways were considered in the ecological assessment. These pathways are linked to either the aquatic environment of Rose Creek, Vangorda Creek, Anvil Creek or Pelly River and/ or the terrestrial environment including the Anvil Range mine site and surrounding areas.

Figures 3.1-3a to 3.1-3d provides schematic representations of the potential pathways of exposure for each terrestrial receptor considered in this assessment. The figures also provide the ingestion rates for all the pathways considered for each of the terrestrial receptors. Appendix D provides the summary of the characteristics of these ecological receptors.

Besides taking into consideration the amount of food consumed by each receptor, it is important to consider where they obtain their food from and what the metals levels are in the food items in the area(s) from which they obtain their food. In this regard, the home range of each of the species was taken into consideration when linking the species to food sources. Smaller animals, due to their small home range, were evaluated at several places across the Anvil Range Mine Complex whereas larger animals, with large home ranges, were evaluated on a site-wide basis. Table 3.1-2 provides a summary of the home ranges of the different terrestrial receptors and the length of time they were considered to be present on the site.

FIGURE 3.1-2
TERRESTRIAL RECEPTORS CONSIDERED IN THE ASSESSMENT

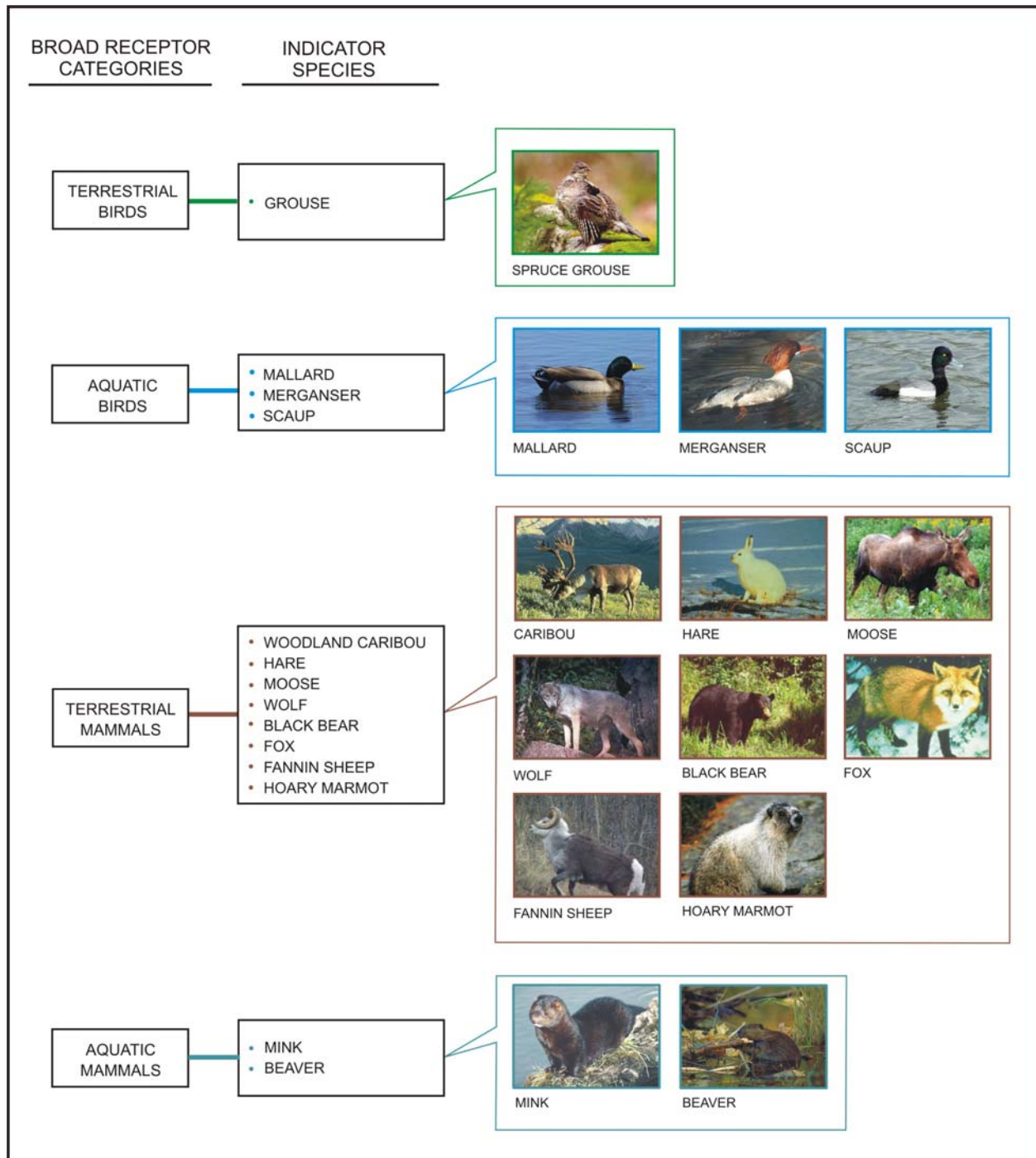


Table 3.1-2 also identifies areas where the various terrestrial receptors were considered to be present. These areas are shown on Figure 3.1-4. The areas were chosen based on the metal levels present in the soils and vegetation and consideration of the home range of the species. With exception of the large mammals which were considered to be exposed to site-wide average values, all other terrestrial receptors were placed at background locations as well as at impacted locations (or areas). Table 3.1-3 provides a more detailed summary of the exact locations of the water, soil and vegetation used for the various terrestrial receptors.

For small local mammals and terrestrial birds, five areas of concern at the Anvil Range Mine were identified as shown in Figure 3.1-4: Background (around Swim Lake), Van-S (around Grum Mine Site), Faro-S (around Faro Mine Site), Faro-N (north of Faro-S) and Faro-W (west of Faro-S).

Larger areas were considered for the medium ranging mammals (see Figure 3.1-4): Van-M (larger than and including Van-S) and Faro-M (larger than and including Faro-S) and Background (same as the background used for small local mammals).

For aquatic animals and birds, five areas of concern were considered: Rose Creek Upstream, Rose Creek Downstream, Vangorda Creek Upstream, Vangorda Creek Downstream and Pelly River at Crossing.

The Mount Mye area and the area around the Vangorda/Grum site was used for assessing the risk for Fannin sheep (see Figure 3.1-4).

Large broad ranging mammals were assumed to be at the site for only a portion of the year as their home range is much larger than the size of the Anvil Range Mine site.

FIGURE 3.1-3a
POTENTIAL PATHWAYS OF EXPOSURE FOR CARIBOU, GROUSE, HARE, MARMOT AND SHEEP

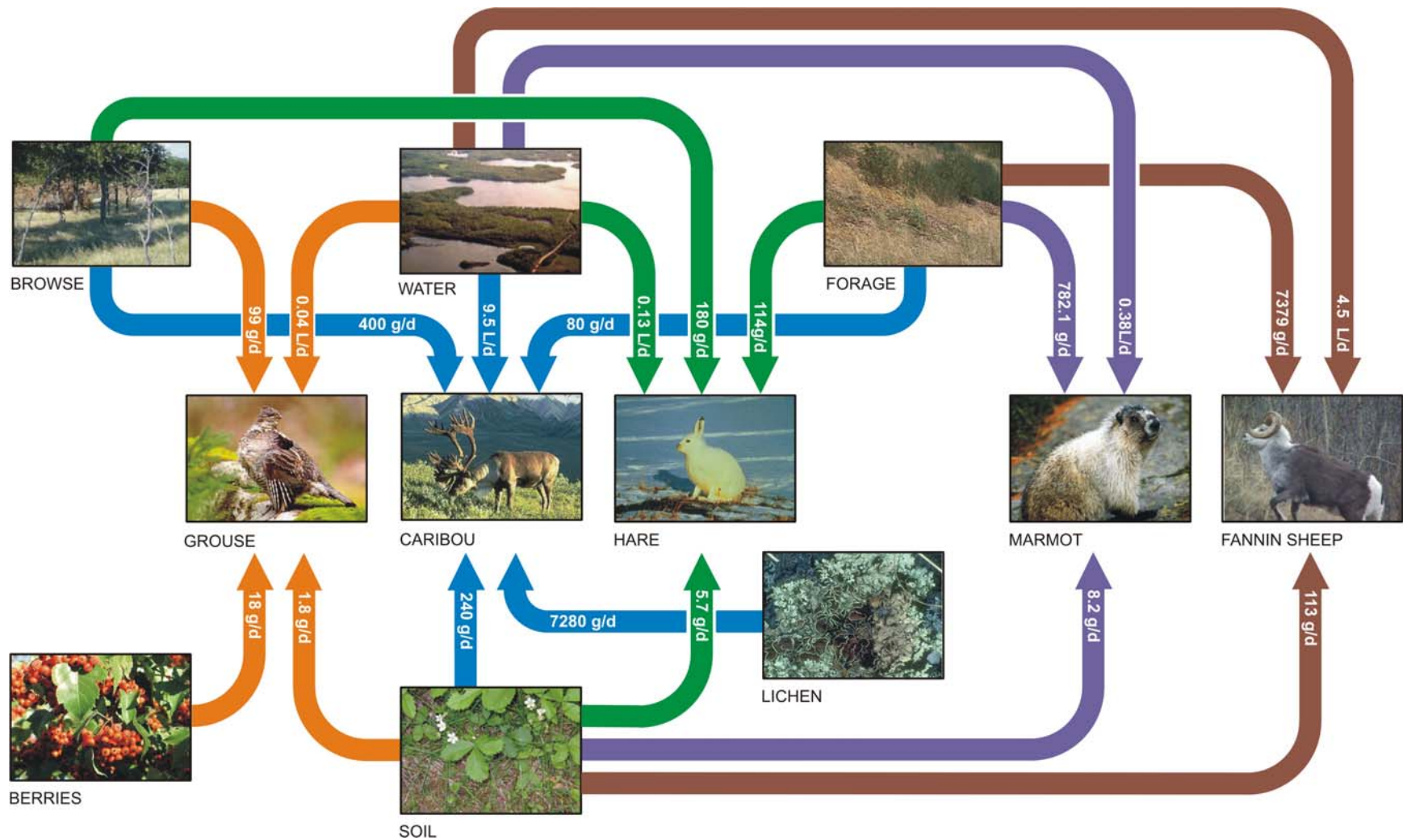


FIGURE 3.1-3b
POTENTIAL PATHWAYS OF EXPOSURE FOR BLACK BEAR, FOX AND WOLF

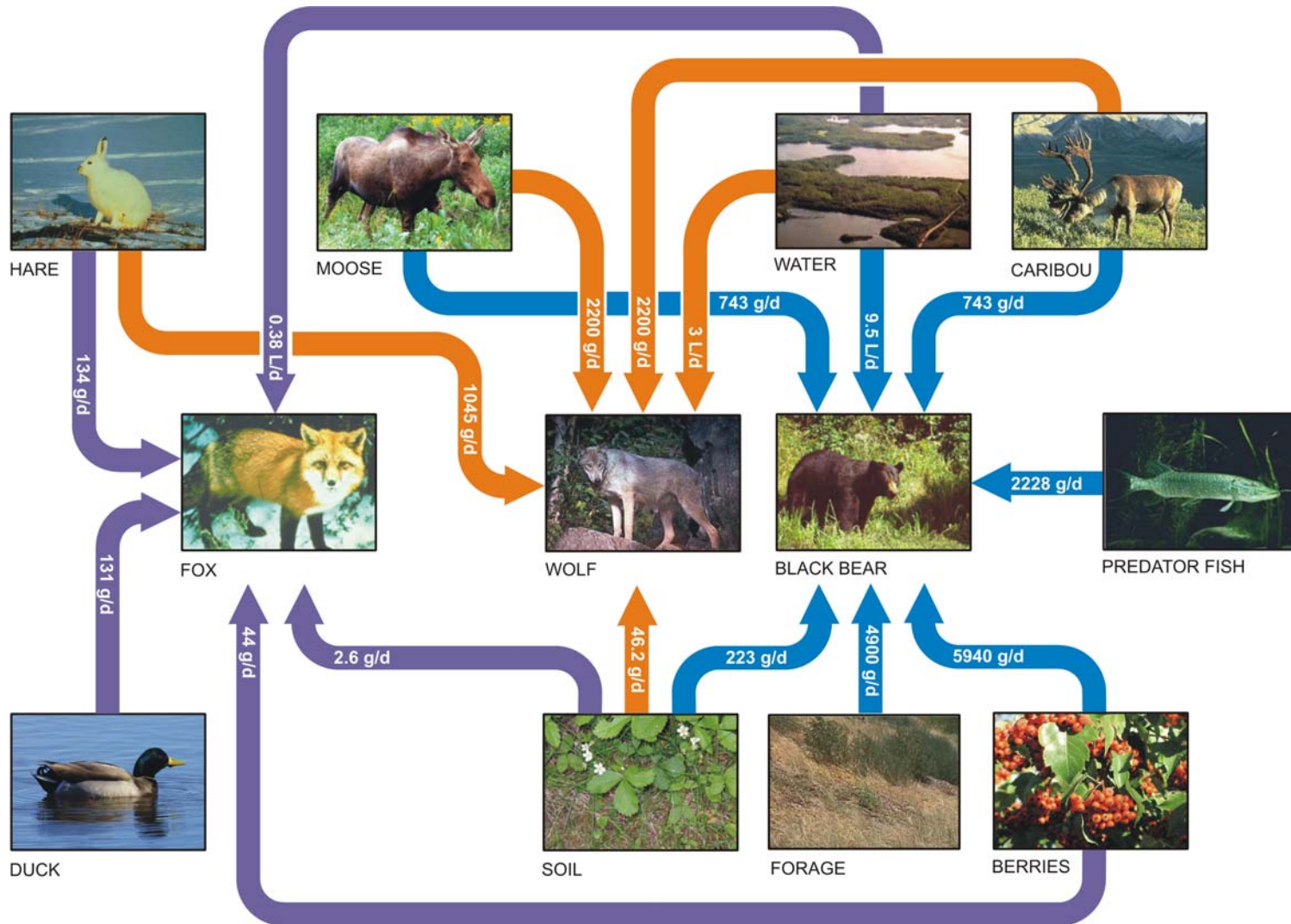


FIGURE 3.1-3c
POTENTIAL PATHWAYS OF EXPOSURE FOR MALLARD, MERGANSER AND SCAUP

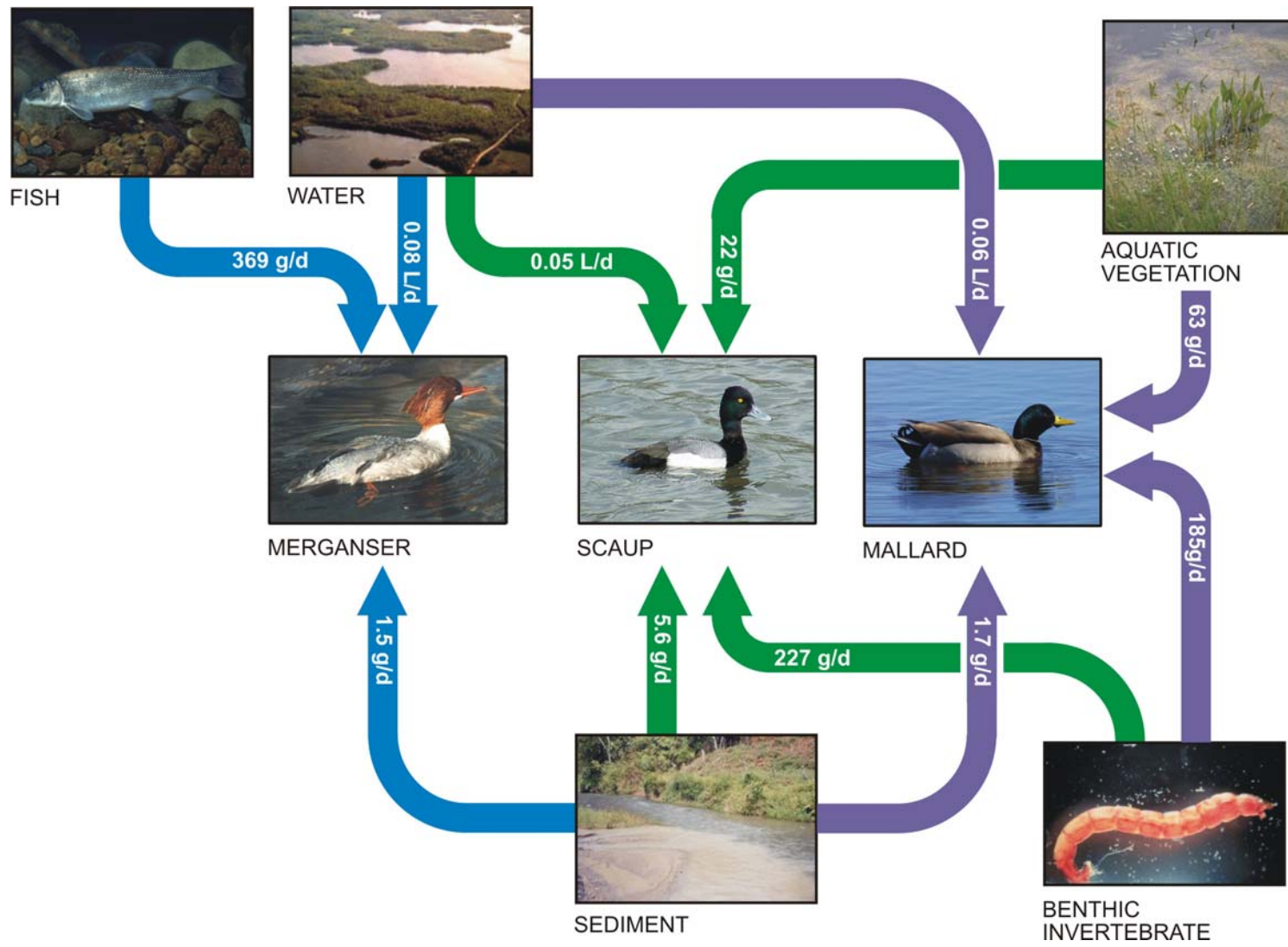


FIGURE 3.1-3d
POTENTIAL PATHWAYS OF EXPOSURE FOR MINK, MOOSE AND BEAVER

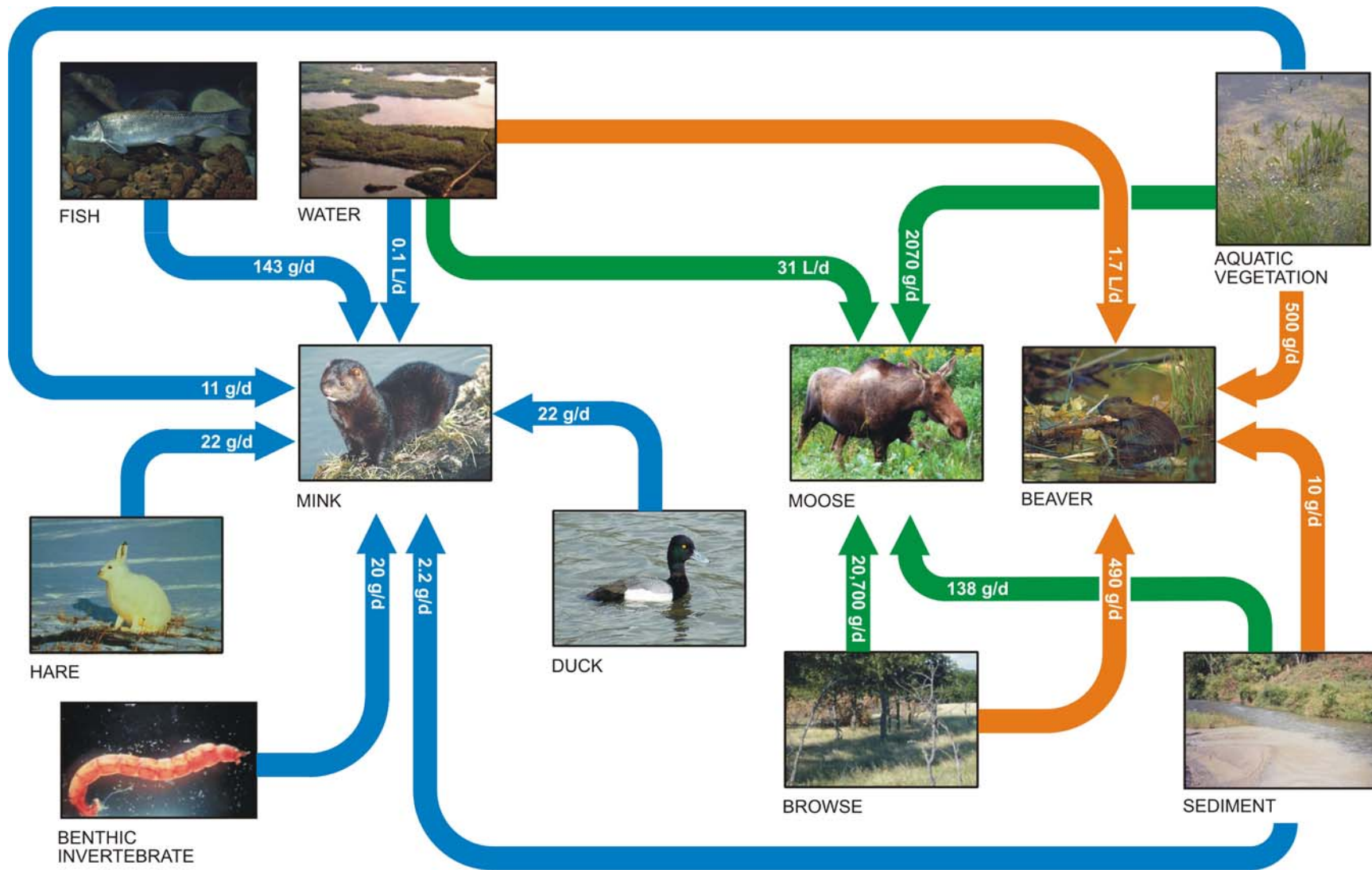


FIGURE 3.1-4
LOCATIONS CONSIDERED IN TERRESTRIAL ASSESSMENT

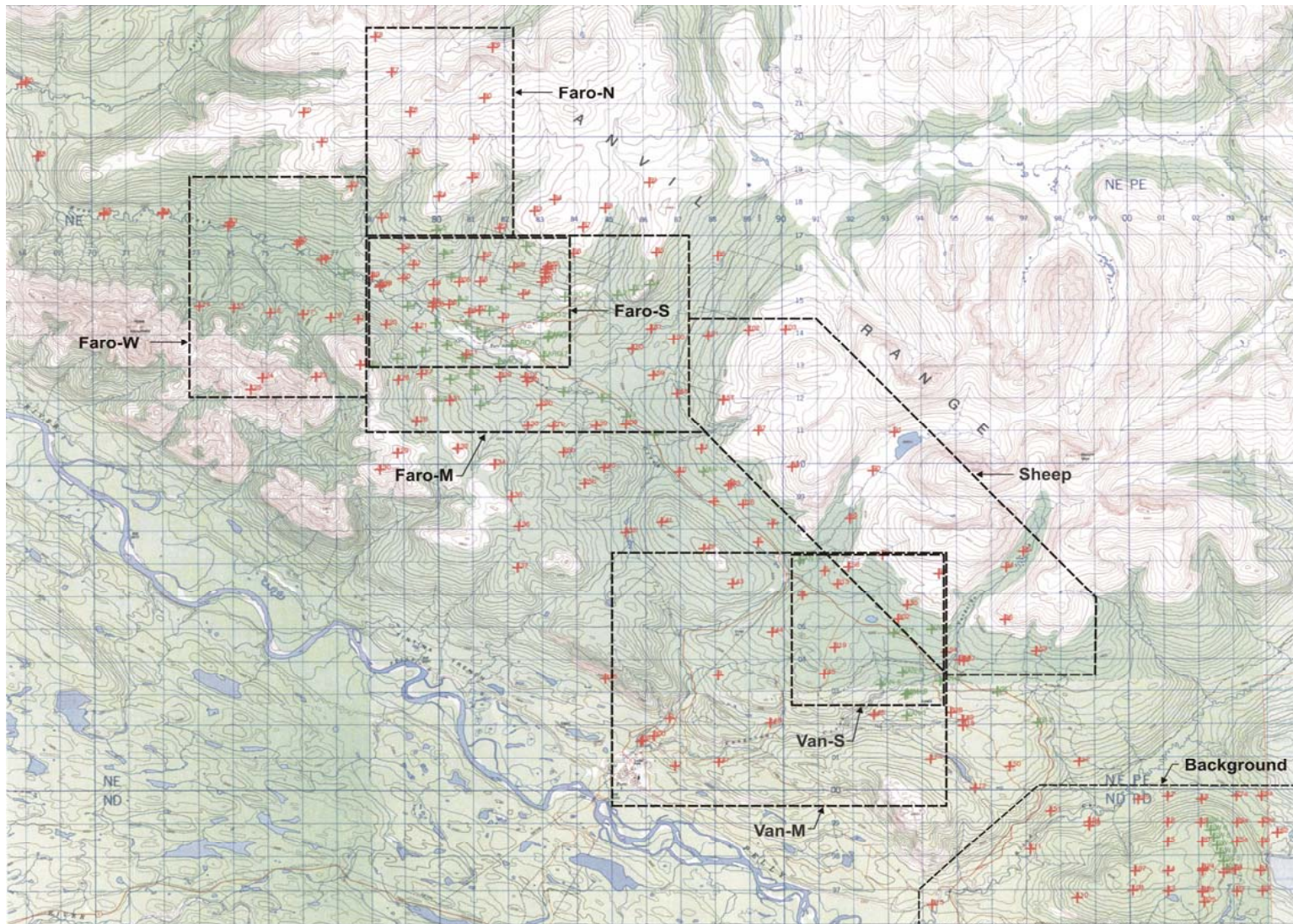


TABLE 3.1-2
EXPOSURE CHARACTERISTICS ASSUMED FOR TERRESTRIAL ECOLOGICAL
RECEPTORS AT ANVIL RANGE MINE SITE

Receptor	Pathways of Exposure	Area of Concern for Ecological Assessment	Fraction of time at site	Home Range
Bear	Water, soil, herbaceous vegetation, berries, fish, moose, caribou	Background Van-M Faro-M	1.0	20 km ² (2.6 to 155 km ²) ^a
Beaver	Water, sediment, terrestrial vegetation, aquatic vegetation	Rose Creek upstream and downstream Vangorda Creek upstream and downstream Pelly River at Pelly Crossing	1.0	0.04 km ² (varies throughout the year from 0.25 ha to 10 ha; focussed on waters edge) ^b
Woodland Caribou	Water, soil, summer forage, browse, lichen	Site-wide (not including background)	0.5	250 km ² ^c
Fox	Water, soil, berries, duck, hare	Background Van-M Faro-M	1.0	6 km ² (4 to 8 km ² around den site) ^d
Grouse	Water, soil, browse, berries	Background Van-S Faro-N Faro-S Faro-W	1.0	0.2 km ² (no migration - resident year round; 0.04 to 0.40 km ²) ^e
Hare	Water, soil, browse, herbaceous vegetation	Background Van-S Faro-N Faro-S Faro-W	1.0	0.08 km ² (6 to 10 ha) ^d
Hoary Marmot	Water, soil, herbaceous vegetation	Background Van-S Faro-N Faro-S Faro-W	1.0	0.09 km ²
Mallard	Water, sediment, benthic invertebrates, aquatic vegetation	Rose Creek upstream and downstream Vangorda Creek upstream and downstream Pelly River at Pelly Crossing	0.5	5.8 km ² ^f (home range in spring - possibly in area from Mar /Apr/May to Sept/Oct/Nov)

TABLE 3.1-2 (Cont'd)
EXPOSURE CHARACTERISTICS ASSUMED FOR TERRESTRIAL ECOLOGICAL
RECEPTORS AT ANVIL RANGE MINE SITE

Receptor	Pathways of Exposure	Area of Concern for Ecological Assessment	Fraction of time at site	Home Range
Merganser	Water, sediment, fish	Rose Creek upstream and downstream	0.5	Possibly in area from April to Sept/Oct
Mink	Water, sediment, aquatic vegetation, benthic invertebrates, duck, fish, hare	Rose Creek upstream and downstream Vangorda Creek upstream and downstream Pelly River at Pelly Crossing	1.0	0.14 km ^{2 f} (7.8 to 20.4 ha depending on vegetation)
Moose	Water, sediment, browse, aquatic vegetation	Site-wide (not including background)	1.0	60 km ^{2 g} (15 to to 100 km ²)
Scaup	Water, sediment, benthic invertebrates, aquatic vegetation	Rose Creek upstream and downstream Vangorda Creek upstream and downstream Pelly River at Pelly Crossing	0.5	0.89 km ^{2 f} (possibly in area from Apr/May to Sept/Oct)
Sheep	Water, soil, herbaceous vegetation	Mount Mye and Vangorda/Grum site	1.0	Resident in the area year-round
Wolf	Water, soil, moose, caribou, hare	Site-wide (not including background)	0.25	1000 km ² (100 to 2500 km ²) ^h

Notes:

- a Home range for a female bear can range between 2.6 km² to 40 km²; the home range for a male bear can range from 21 km² to 155 km² (American Bear Association 2003).
- b Wheatley 1994; Kent Wildlife Trust (2003).
- c Rock (1992).
- d Hinterland Who's Who (Canadian Wildlife Service 2005).
- e Home range for a female grouse is from 0.16 km² to 0.40 km²; home range for a male grouse is from 0.04 km² to 0.20 km² (North Carolina State University 1995).
- f U.S. EPA (1993).
- g In northern Saskatchewan, it is reported that moose may range over 25 to 100 km² (Cameco 2004). Home range studies based on radio-collared individuals were reported to average 59 km² for the Copper River Delta in south-central Alaska (MacCracken et al. 1997). In more southerly regions such as Idaho, the home range for female moose has been observed to range from 15.5 to 25.9 km², and for male from 31 to 51.8 km² (Pierce and Peck 1984).
- h In Alaska, the home range may include some 200 to 600 square miles (520-1560 km²) of habitat (Woodland 2005). Home range is 100 to 2500 km² (Resources Inventory Committee 1998).

TABLE 3.1-3
SUMMARY OF LOCATIONS EVALUATED IN TERRESTRIAL ASSESSMENT

Receptor	Area of Concern	Pathways of Exposure
Bear	Background	water and fish from Pelly River U/S soil, forage and berries from Background area
	Faro-M	water and fish from Rose Creek D/S soil, forage and berries from Faro-M
	Van-M	water and fish from Vangorda Creek D/S soil, forage and berries from Van-M
Beaver	Rose Creek U/S	water, sediment and aquatic vegetation from Rose Creek U/S browse from background
	Rose Creek D/S	water, sediment and aquatic vegetation from Rose Creek D/S browse from Faro-M
	Vangorda Creek U/S	water, sediment and aquatic vegetation from Vangorda Creek U/S browse from background
	Vangorda Creek D/S	water, sediment and aquatic vegetation from Vangorda Creek D/S browse from Van-M
	Pelly River at Crossing	water, sediment and aquatic vegetation from Pelly River at Crossing browse from Van-M
Caribou	Site-Wide	water from the average of the five aquatic areas soil, lichen, forage and browse from site-wide average
Fox	Background	water and ducks from Pelly River U/S soil, berries and hare from Background area
	Faro-M	water and ducks from Rose Creek D/S soil and berries from Faro-M; hare from Faro-S
	Van-M	water and ducks from Vangorda Creek D/S soil and berries from Van-M; hare from Van-S
Grouse	Background	water from Pelly River U/S soil, berries and browse from Background area
	Faro-S	water from Rose Creek D/S soil, berries and browse from Faro-S
	Faro-N	water from Rose Creek D/S soil, berries and browse from Faro-N
	Faro-W	water from Rose Creek D/S soil, berries and browse from Faro-N
	Van-S	water from Vangorda Creek D/S soil, berries and browse from Van-S
Hare	Background	water from Pelly River U/S soil, forage and browse from Background area
	Faro-S	water from Rose Creek D/S soil, forage and browse from Faro-S
	Faro-N	water from Rose Creek D/S soil, forage and browse from Faro-N
	Faro-W	water from Rose Creek D/S soil, forage and browse from Faro-N
	Van-S	water from Vangorda Creek D/S soil, forage and browse from Van-S

TABLE 3.1-3 (Cont'd)
SUMMARY OF LOCATIONS EVALUATED IN TERRESTRIAL ASSESSMENT

Receptor	Area of Concern	Pathways of Exposure
Hoary Marmot	Background	water from Pelly River U/S soil and forage from Background area
	Faro-S	water from Rose Creek D/S soil and forage from Faro-S
	Faro-N	water from Rose Creek D/S soil and forage from Faro-N
	Faro-W	water from Rose Creek D/S soil and forage from Faro-N
	Van-S	water from Vangorda Creek D/S soil and forage from Van-S
Mallard	Rose Creek U/S	water, sediment, benthic and aquatic vegetation from Rose Creek U/S
	Rose Creek D/S	water, sediment, benthic and aquatic vegetation from Rose Creek D/S
	Vangorda Creek U/S	water, sediment, benthic and aquatic vegetation from Vangorda Creek U/S
	Vangorda Creek D/S	water, sediment, benthic and aquatic vegetation from Vangorda Creek D/S
	Pelly River at Crossing	water, sediment, benthic and aquatic vegetation from Pelly River Crossing
Merganser	Rose Creek U/S	water, sediment and fish from Rose Creek U/S
	Rose Creek D/S	water, sediment and fish from Rose Creek D/S
	Vangorda Creek U/S	water, sediment and fish from Vangorda Creek U/S
	Vangorda Creek D/S	water, sediment and fish from Vangorda Creek D/S
	Pelly River at Crossing	water, sediment and fish from Pelly River at Crossing
Mink	Rose Creek U/S	water, sediment, aquatic vegetation, benthic, fish and ducks from Rose Creek U/S hare from background
	Rose Creek D/S	water, sediment, aquatic vegetation, benthic, fish and ducks from Rose Creek D/S hare from Faro-S
	Vangorda Creek U/S	water, sediment, aquatic vegetation, benthic, fish and ducks from Vangorda Creek U/S hare from background
	Vangorda Creek D/S	water, sediment, aquatic vegetation, benthic, fish and ducks from Vangorda Creek D/S hare from Van-S
	Pelly River at Crossing	water, sediment, aquatic vegetation, benthic, fish and ducks from Pelly River at Crossing hare from Van-S
Moose	Site-Wide	water, sediment and aquatic vegetation from the average of the five aquatic areas browse from site-wide average
Scaup	Rose Creek U/S	water, sediment, benthic and aquatic vegetation from Rose Creek U/S
	Rose Creek D/S	water, sediment, benthic and aquatic vegetation from Rose Creek D/S
	Vangorda Creek U/S	water, sediment, benthic and aquatic vegetation from Vangorda Creek U/S
	Vangorda Creek D/S	water, sediment, benthic and aquatic vegetation from Vangorda Creek D/S
	Pelly River at Crossing	water, sediment, benthic and aquatic vegetation from Pelly River Crossing
Fannin	Mount Mye and Vangorda/Grum area	water from average of Vangorda Creek U/S and Vangorda Creek D/S soil and forage from Mount Mye area
Wolf	Site-Wide	water from the average of the five aquatic areas soil, moose and caribou from site-wide average; hare from the average of the five terrestrial areas for small local mammals

3.2 HUMAN RECEPTORS

A report from Weinstein (1992) indicates that in the 1990's the mine/townsite area was used for gathering activities. This activity stemmed from a fire which destroyed the Faro townsite in 1969 that promoted an abundance of berry producing plants and fire-killed timber. Hunting activities also occur at the site and surrounding area; however, there is a lack of fishing on the mine site creeks including Anvil Creek and creeks near the townsite. This is similar to information collected on the current usage of the site by Gartner Lee. Based on the activities at the site discussed in the report by Weinstein (1992), this assessment considered the potential for adverse effects on hypothetical individuals who would camp at the site while hunting and gathering. It was assumed that the time that a hypothetical camper might spend on-site would encompass the time frame that trappers and other occasional users might be on the site.

It was assumed that a family would camp on the site and carry out their hunting and gathering activities; therefore, an adult, child and toddler were considered in the assessment. The assessment was carried out for campers on the Rose Creek watershed and the Vangorda Creek watershed separately. The time that the campers spend on site was based on the time spent at various activities on the site as provided by Weinstein (1992). Thus, it was assumed for all scenarios that campers would be present at the site for approximately 1.5 months of the year. Based on the Weinstein report, it was assumed that fishing only occurred on the Pelly River in the "Existing" and "No Intervention" scenarios. In the "Remediation" and "Treat All Flows" scenarios, it was assumed that fishing activities would be carried out in both the Rose Creek and Vangorda Creek watersheds.

Dietary data from a regional survey of First Nations people in the Yukon were used to define the dietary characteristics for campers who would be present at the Anvil Range Mine Complex. Other exposure data, such as drinking water consumption and body weight, were obtained from a survey of the general Canadian population and are acceptable for use in the current assessment.

Chapter 4 provides a detailed discussion on the receptor locations and dietary characteristics of the hypothetical campers considered in the assessment.

3.2.1 Pathways Considered

The human exposure analysis focused on the pathways as shown on Figure 3.2-1. They include:

- consumption of drinking water containing COPC from Pelly River, Vangorda Creek or Rose Creek by humans;
- uptake by caribou of COPC from water, soil and vegetation and consumption of caribou flesh by humans;

- uptake by moose of COPC from water, sediment and aquatic and terrestrial vegetation and consumption of moose flesh by humans;
- uptake by sheep of COPC from water, soil and vegetation and consumption of sheep flesh by the human receptors;
- uptake by snowshoe hare of COPC from water, soil and vegetation and consumption of hare flesh by the human receptors;
- uptake by hoary marmot of COPC from water, soil and vegetation and consumption of marmot flesh by the human receptors;
- uptake by grouse of COPC from water, soil and vegetation and consumption of grouse flesh by humans;
- uptake by beaver of COPC in water, sediments and vegetation and consumption of beaver flesh by humans;
- uptake by duck of COPC in water, sediment, benthic invertebrates and vegetation and consumption of duck flesh by humans;
- uptake by fish of COPC from the aquatic environment (Pelly River, Vangorda Creek or Rose Creek) and consumption of fish flesh by humans;
- uptake of COPC in soil by berries/medicinal plants and consumption of berries/medicinal plants by humans; and,
- inadvertent ingestion of soil containing COPC and dermal contact with soil by humans.

There are no pathways for contamination to intersect groundwater that could potentially be used for drinking water; therefore, the groundwater pathway was not evaluated.

As indicated by Health Canada (2004) in their PQRA Manual, the fugitive dust pathway (airborne respirable dust) is “*generally insignificant relative to direct ingestion of soil and water and to dermal absorption*”; therefore, this pathway was not considered in the assessment.

3.2.2 Location of Receptors and Time spent on Site

Based on the report by Weinstein (1992), an approximate pattern of land use and time spent at the Anvil Mine Complex in the 1980's and 1990's was determined. Figure 3.2-2 provides a diagram of this pattern. As seen in the figure, no fishing occurs on the Anvil Mine Complex; however, gathering and hunting/trapping activities occur on site. It can be seen that trapping activities around the site can occur for up to approximately 50 days; therefore, for purposes of this assessment it was assumed that in the “Existing” and “No Intervention” scenarios, individuals could potentially be present at the site for 1.5 months of the year. It was assumed that individuals would fish in the Pelly River.

FIGURE 3.2-1
POTENTIAL PATHWAYS OF EXPOSURE FOR HUMAN RECEPTORS

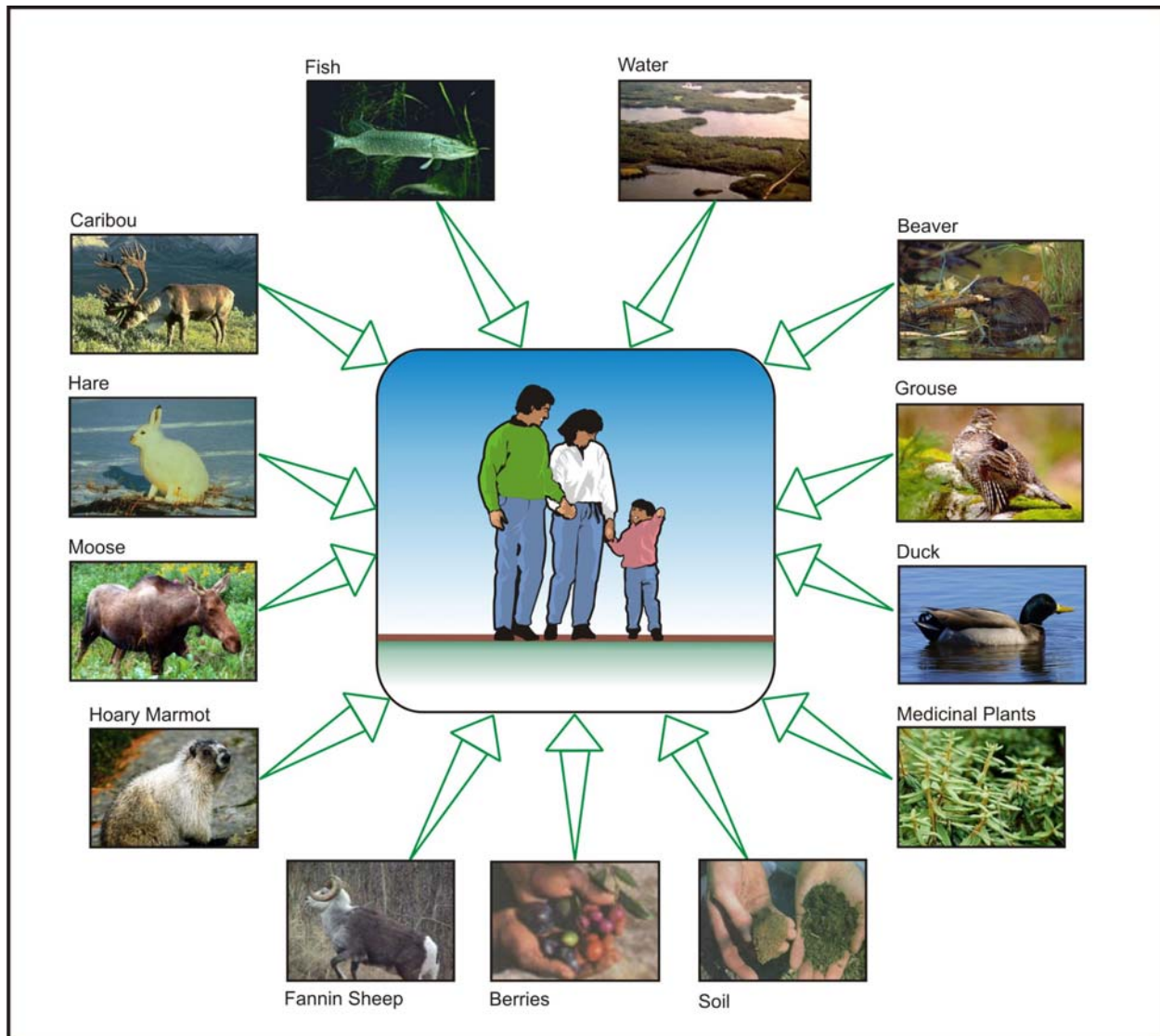
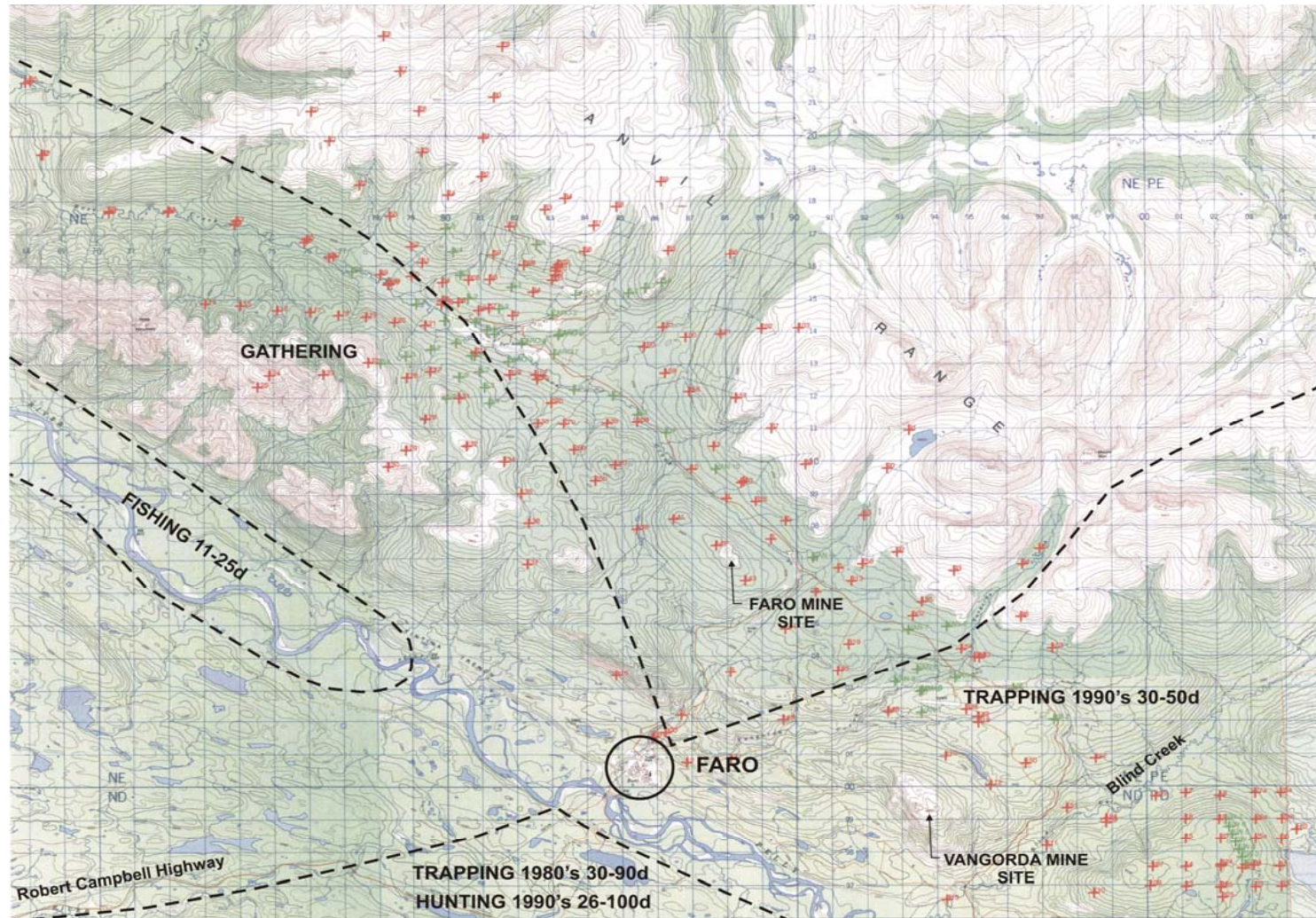


FIGURE 3.2-2
LAND USE MAP OF ANVIL RANGE MINE SITE



Under the remedial scenarios considered in the assessment, it was assumed that individuals would return to fishing on the site and that they would potentially camp at the site. It was assumed that they would still spend up to 1.5 months at the site.

The assessment assumes that all of these activities (hunting, trapping, gathering, fishing) occur at the same time; however, hunting and trapping generally occur in the fall and winter time and possibly spring whereas gathering, fishing and inadvertent ingestion of soil occur during the summer months. For the purposes of this assessment, it was assumed that some meat and fish would be taken from the Anvil site and consumed by individuals. It was assumed that this would be done over a six-month period whereas drinking water and soil exposure would only occur over the 1.5 month at the site.

Table 3.2-1 provides a summary of the receptors considered in the assessment, the location of the various dietary components based on the information from Weinstein (1992) and the terrestrial locations provided in Figure 3.1-4. Weinstein (1992) suggests that there are two core regions that are family geographic centers: the Upper Pelly River-Pelly Lakes and Campbell Creek area in the east and the Mye Mountain-Blind Creek-Swim Lakes region in the west. In order to capture the Mount Mye-Blind Creek and Swim Lakes region within the assessment, it has been assumed in the “Existing” scenario that there are individuals who camp in the Blind Creek area. Information provided by Gartner Lee indicates that there is a camp in the Blind Creek/Vangorda area of the site. The Upper Pelly River-Pelly Lakes-Campbell Creek area is not located in close proximity to the Anvil Range Mine Complex and was not considered. However, another group was added that was assumed to be present in the Rose Creek area to capture a range of exposures under the “Existing” scenario at the Anvil Range Mine Complex. Both groups are assumed to get water and fish from the Pelly River as it is reported that fishing does not occur on the site. It was assumed that small mammals are trapped in the areas of highest contamination and that berries and medicinal plants are gathered in a larger area around the camp. As with the terrestrial assessment, it was assumed that larger terrestrial mammals such as moose and caribou have a larger home range and would be hunted across the entire site.

TABLE 3.2-1
LOCATION OF THE VARIOUS DIETARY COMPONENTS FOR THE HUMAN RECEPTORS

Receptor	Drinking Water	Fish/Ducks	Large Mammals	Small Mammals	Sheep	Berries/Medicinal Plants	Soil	Time on Site
“Existing” and “No Intervention” Scenarios								
Camper 1	Pelly River (Background)	Pelly River (Background)	Site Wide	Faro S	Sheep (Mt Mye)	Faro S/M/N/W	Faro W	1.5
Camper 2	Pelly River above Vangorda Creek	Pelly River above Vangorda Creek	Site Wide	Background	Sheep (Mt Mye)	Background	Background	1.5
“Remediation” and “Treat All Flows” Scenarios								
Camper 3	Pelly River (Background)	Pelly River (Background)	Site Wide	Van S	Sheep (Mt Mye)	Van S/M	Van M	1.5
Camper 4	Rose Creek downstream	Rose Creek downstream	Site Wide	Faro S	Sheep (Mt Mye)	Faro S/M/N/W	Faro S	1.5
Camper 5	Vangorda Creek downstream	Vangorda Creek downstream	Site Wide	Van S	Sheep (Mt Mye)	Van S/M	Van S	1.5

Note: Camper 1 is also evaluated in the “Remediation” and “Treat All Flows” scenarios for comparative purposes

3.2.3 Assumed Dietary Characteristics

The dietary characteristics for the assessment were based on a study of Yukon First Nations communities in 1998. It is acknowledged that this information was not collected for the purposes of this assessment; however, it is the best information available at present for conducting this assessment. Assumptions regarding the intakes of the adult and child receptors are outlined below.

Food Consumption

Traditional and market food intake rates for the Yukon First Nations' group were derived from Receveur *et al.* (1998). The use of region-specific dietary intake rates was deemed more appropriate than the use of other data sources and methods to estimate traditional and market food intakes, and is associated with less uncertainty.

Receveur *et al.* (1998) collected dietary intake data using methods including food frequency questionnaires and 24-hour recall surveys administered by trained interviewers during the late winter and fall of 1995. Ten communities in the Yukon participated in the study, including Dawson City, Mayo, Carmacks, Ross River, Watson Lake, Lower Post, Beaver Creek, Burwash Landing, Carcross and Atlin. Only adults in the communities were sampled, and included both men and women divided into age categories including ages 20-40, ages 41-60 and 61+ years.

Traditional food intake rates were available for both consumers only (people who only eat traditional foods) and consumers and non-consumers (people who eat a mixture of store bought food and traditional food). Rates for consumers and non-consumers provide an average estimate for the community, while rates for consumers only provide an upper bound on the average estimate for the community. Intake rates for both groups were derived for this assessment.

To derive average traditional food intake rates for an adult at Anvil Range Mine, rates provided by Receveur *et al.* (1998) were first averaged for both sexes over the three adult age groups for which data were available. Traditional food items were subsequently grouped into categories including meat and poultry, fish, and berries in order to calculate intake rates for these based on a summation of the group items. The food groupings chosen were those typically used in Canadian total diet studies (Richardson 1997, Health Canada 2005).

Traditional food items in the meat and poultry group contained some items for which concentrations of COPC could not be estimated in the risk assessment, such as moose bone marrow and heart. The amount consumed of each of these items was counted nonetheless so as not to under-estimate intake of traditional foods. However, it was assumed that the metals content of these items was the same as that in the flesh of the animal under consideration; this

would provide an underestimate of the COPC intake as organs generally contain higher concentrations of COPC. A sensitivity analysis was performed to determine the effect of organ consumption.

The intake for a child was estimated assuming that the ratio of child to adult of a particular category of food for the general population (Richardson 1997) could be applied to the information for the Yukon First Nations region.

Table 3.2-2 provides the average traditional food intake rates (people who eat traditional food and a mixture of store bought food) derived from Receveur *et al.* (1998) for a Yukon First Nation adult and child.

Total meat and fish intake rates were derived for risk assessment purposes, as well as fractions of the intake rate attributable to different traditional foods. This rate is presented in Table 3.2-2 and the fractions are presented in Table 3.2-3.

TABLE 3.2-2
INTAKE OF TRADITIONAL FOODS FOR YUKON FIRST NATION

Food Category	Mean Intake Rate (g/d)	
	Child	Adult
Meat and poultry	128	173
Fish and shellfish	16.0	21.6
Fruit	1.21	1.63
Total meat and fish	144	195

Source: Receveur *et al.* 1998

TABLE 3.2-3
COMPOSITION OF DIFFERENT FRACTIONS OF MEAT AND FISH INTAKE FOR YUKON FIRST NATION

Traditional Food Item	Dietary Fraction
Fraction that is caribou	0.06
Fraction that is moose	0.75
Fraction that is dall sheep	0.004
Fraction that is hare	0.03
Fraction that is hoary marmot	0.02
Fraction that is poultry	0.01
Fraction that is beaver	0.02
Fraction that is fish	0.11

Source: Receveur *et al.* 1998.

Table 3.2-4 provides the traditional food intake rates for consumers only derived from Receveur *et al.* (1998) for a Yukon First Nations adult and child.

Again, a total meat and fish intake rate was also derived for risk assessment purposes, as well as fractions of the intake rate attributable to different traditional foods. This rate is presented in Table 3.2-4 and the fractions are presented in Table 3.2-5.

TABLE 3.2-4
INTAKE OF TRADITIONAL FOODS FOR YUKON FIRST NATION
(CONSUMERS OF TRADITIONAL FOOD ONLY)

Food Category	Mean Intake Rate (g/d)	
	Child	Adult
Meat and poultry	2804	3790
Fish and shellfish	1544	2086
Fruit	501	677
Total meat and fish	4348	5876

Source: Receveur *et al.* 1998

TABLE 3.2-5
COMPOSITION OF DIFFERENT FRACTIONS OF MEAT AND FISH INTAKE FOR
YUKON FIRST NATION (CONSUMERS OF TRADITIONAL FOOD ONLY)

Traditional Food Item	Dietary Fraction
Fraction that is caribou	0.05
Fraction that is moose	0.36
Fraction that is dall sheep	0.03
Fraction that is hare	0.04
Fraction that is hoary marmot	0.02
Fraction that is poultry	0.05
Fraction that is beaver	0.11
Fraction that is fish	0.36

Source: Receveur *et al.* 1998

Intake rates for commercial market foods were also available in Receveur *et al.* (1998). Similar to the methods used for the intakes of traditional foods, adults of different age groups were interviewed regarding their consumption of market food using 24-hour dietary recall surveys conducted by trained interviewers during the late winter and fall of 1995. Intake rates for individual market food items for consuming and non-consuming adults of different age groups and sexes were subsequently calculated by Receveur *et al.* (1998).

To derive average market food intake rates for an adult at the Anvil Range Mine Complex, rates by Receveur *et al.* (1998) for the Yukon First Nation were first averaged for both sexes over the three adult age groups for which data were available. Market food items were then grouped into their respective food categories, which included milk and dairy products, meat and poultry, fish and shellfish, soups, bakery goods and cereals, vegetables, fruits and fruit juices, fats and oils, sugar and candies, beverages and miscellaneous items based on a summation of individual items in the group. The food groupings chosen were those typically used in Canadian total diet studies (Richardson 1997, Health Canada 2005). Market foods intake rates were only available for consumers and non-consumers combined (zeros in).

Again, the intake for a child was estimated assuming that the ratio of child to adult of a particular category of food for the general population (Richardson 1997) could be applied to the information for the Yukon First Nation region. A similar ratio was used to determine toddler intakes.

Table 3.2-6 provides the market food intake rates derived from Receveur *et al.* (1998) for a Yukon First Nation adult and child.

TABLE 3.2-6
INTAKE OF MARKET FOODS BASED ON THE YUKON FIRST NATION

Food Category	Mean Intake Rate of Market Foods (g/d)	
	Child	Adult
Milk and dairy products	52	70
Meat and poultry	132	178
Fish and shellfish	2.6	3.5
Soups	104	141
Bakery goods and cereals	137	185
Vegetables	143	193
Fruit and fruit juices	46	63
Fats and oils	14	19
Sugar and candies	25	34
Beverages	1021	1379
Miscellaneous	56	76

Source: Receveur *et al.* 1998

As a significant amount of the beverage intake is coffee and tea, the beverage intake for the child is likely overstated.

In this assessment, the dietary intakes for people who eat a mixture of traditional foods and store bought foods were used as this seems indicative of the community around the Anvil Mine Complex.

Medicinal Tea Intake

First Nations People generally use Labrador tea and other teas made from natural plants for medicinal purposes. The Yukon dietary survey (Receveur *et al.* 1998), for the area only, indicated that in the winter 12% of the population consumes Labrador Tea 1.2 days/week and in the summer 23% of the population consumes Labrador Tea 1.4 days/week. This equates to an average Labrador Tea consumption of 1.3 days per week. The survey does not provide the amount of Labrador tea or other medicinal teas that are consumed.

In an attempt to determine the amount of medicinal tea consumed by members of the community, a web search was undertaken. The web search indicated that “*Labrador Tea contains small amounts of the toxin andromedotoxin which can cause headaches, cramps, paralysis and intestinal problems if too much is consumed. As a general rule, this tea should be consumed in moderation. One cup is often considered the safe amount.*” - <http://www.laurentiancenter.com/plantkey/plants/labradortea.html>

Therefore, it was assumed in this assessment that an adult (70kg body weight) would consume 250 mL (1 cup) of medicinal teas for 1.3 days a week. This equates to a consumption rate of 0.17 cups/day. There was no information available on the amount of fresh Labrador tea used in the brewing process. In this assessment, it was assumed that approximately 3 g were used. This is equivalent to a bag of regular tea.

Water Intake

The water intakes for an adult and child were obtained from the “*Compendium of Canadian Human Exposure Factors for Risk Assessment*” (Richardson, 1997). The average water intakes for an adult, child (5 to 11 years of age) and toddler (0.5 to 4 years of age) is estimated to be 1.5 L/d, 0.8 L/d and 0.6 L/d respectively.

Soil Intake

Soil intake rates were obtained from Health Canada (2003) and were based on the information obtained from CCME (1996) and the Massachusetts Department of Environmental Protection (MADEP 2002). The mean daily soil intake provided for an adult was 20 mg/d, and, for a child was 20 mg/d. The mean soil intake for a toddler is reported to be 80 mg/d.

Body Weight

The body weight (bw) of a toddler, child and adult are also necessary in order to calculate a daily intake (mg/(kg (bw) d)). In this assessment, the body weights used for the toddler, child and adult receptors were 16.5 kg, 32.9 kg and 70.7 kg, respectively (Richardson 1997).

3.2.3.1 Summary of Receptor Characteristics

The nominal amount of traditional foods and berries that were assumed to be consumed by the adult, child and toddler receptors present at the Anvil Range Mine Complex are summarized in Table 3.2-7.

TABLE 3.2-7
AVERAGE AIR, WATER AND LOCAL FOOD INTAKE RATES USED FOR ADULT, CHILD AND TODDLER IN THE PATHWAYS MODELLING

	Receptor		
	Adult	Child	Toddler
Air (m³/d)	15.8	14.5	9.3
Water (L/d)	1.5	0.8	0.6
Soil Intake (mg dw/d)	20	20	80
Local Meat (g ww/d)			
Caribou	11.8	8.7	6.1
Moose	146	108	75.9
Sheep	0.7	0.5	0.4
Other small mammals	13.5	10	7
Local Poultry (g ww/d)			
Ground birds	0.7	0.5	0.4
Water birds	0.3	0.2	0.17
Local Fish (g ww/d)	21.6	17.5	10.8
Total local meat, fish and poultry (g ww/d)	195	145	101
Other (g ww/d)			
Berries	1.6	1.8	1.6

Note: Adult Weight = 70.7 kg; Child Weight = 32.9 kg; Toddler = 16.5 kg

4.0 EXPOSURE ASSESSMENT

The exposure assessment phase of an ecological and human health risk assessment entails the quantification of exposure for the selected receptors. As previously noted, the pathways of exposure considered in this assessment are related to contaminants (mostly metals) present in various media (water, soils, vegetation (aquatic and terrestrial), sediments, etc.) in the vicinity of the mine and tailings areas. The approach and assumptions applied in this assessment are described in this chapter.

The data provided in this chapter include the predicted water quality in Rose Creek and Vangorda Creek for a range of potential remedial options and estimates of the potential intakes of the COPC by ecological species exposed to COPC in the aquatic and terrestrial environments. The implications of the predicted and measured exposure levels of the COPC are discussed in Chapter 6.

4.1 PATHWAYS ANALYSIS

Exposure of the receptors described in Chapter 3 to the COPC was calculated using a pathways modelling approach. Pathways modelling combines the receptor characteristics (described in Chapter 3) with environmental media concentrations of COPC (Chapter 2) to estimate exposure of each receptor.

When measured environmental media concentrations of COPC are not available, they can be estimated using transfer factors and certain assumptions. Transfer factors are empirical values that provide a measure of the partitioning behaviour of a COPC between two environmental media. Transfer factors are available from literature sources or from site-specific measurements to describe partitioning between many different media, including water-to-fish, water-to-sediment, water-to-benthic invertebrates, food-to-animal flesh and other media. In this assessment, site-specific transfer factors were derived for sediment, fish and browse as shown in Table 4.1-1. The calculation of site-specific distribution coefficients and transfer factors did not consider measured values that were reported as less than the analytical method detection limit. These results were not included in averages, number of samples or summary statistics.

Literature derived transfer factors were used in the aquatic environment for water-to-aquatic vegetation and water-to-benthic invertebrates as no measured data were available to derive site-specific values for the Anvil Range site streams. Therefore, for the aquatic pathways, representative maximum concentrations of COPC measured in water, fish and sediments were used in the pathways analysis for the “Existing” scenario and site-specific transfer factors were used to develop concentrations of COPC in aquatic plants and benthic invertebrates. For all

other scenarios, site-specific transfer factors were used to predict concentrations of COPC in the environmental media of interest based on predicted concentrations in receiving waters for the respective scenarios. Water concentrations in the future scenarios were obtained from water quality modelling predictions completed by SRK Consulting (see Appendix A).

In the terrestrial environment, measured concentrations were available for soil, berries and forage for the “Existing” scenario. Site-specific transfer factors were used to predict concentrations in browse in areas where there were no measured values. It was assumed that the remedial activities at the site would not affect the soil and vegetation concentrations; therefore, in the terrestrial pathways, the same concentrations were used for all scenarios assessed. Measured caribou and moose concentrations were used since the animals were obtained from the site. Literature derived transfer factors were used for the food-flesh transfer of COPC for all other animals since site-specific data were not available.

TABLE 4.1-1
SUMMARY OF SITE-SPECIFIC TRANSFER FACTORS USED IN ASSESSMENT

COPC	Average Water-to-Sediment Distribution Coefficient (mg/kg (dw))/(mg/L))	Water-to-Fish Transfer Factor (mg/kg (ww))/(mg/L))	Site-Specific Soil-to-Browse Transfer Factor (mg/kg(ww))/(mg/kg(dw)))
Arsenic	9,100	62	0.012
Copper	50,000	682	0.14
Lead	30,000	68	0.0016
Manganese	18,000	196	0.22
Nickel	17,000	48	0.43
Silver	880	346	0.0074
Tin	n/a	120	0.02
Zinc	7,900	1075	0.356

Note: n/a – not enough samples with concentration above MDL for the calculation.

The assumptions, equations and transfer factor values used to conduct the pathways analysis are discussed in detail in Appendix E.

4.2 METAL BIOAVAILABILITY

Bioavailability of a chemical can be defined as the fraction of an administered dose that reaches the central (blood) compartment, whether through the gastrointestinal tract, skin or lungs (NEPI 2000). This type of bioavailability is known as “absolute bioavailability”.

In risk assessments, oral exposures are generally described in terms of an external dose or intake, as opposed to an absorbed dose or uptake. Intake occurs as an agent enters the body of a human

or animal without passing an absorption barrier (e.g., through ingestion or inhalation), while uptake occurs as an agent passes across the absorption barrier (IPCS 2000). Not all materials (e.g., metals, nutrients) that enter the body as intake are absorbed into the body as uptake. Many are passed through the body and expelled without effect.

When calculating the intake via the oral route of exposure, it is customary to take into account the food, water and soil pathways. As there was insufficient information to derive site-specific bioavailability/bioaccessibility factors, it was assumed that all the COPC were 100% available from all sources. This is a highly conservative assumption as in reality the bioaccessibility of COPC from soil/sediment is generally less than 100%.

4.3 WATER QUALITY PREDICTIONS

The following section provides a summary of the comparisons between the predicted concentrations in each of the watersheds (Rose Creek, Vangorda Creek, Anvil Creek and Pelly River) for the four different remediation scenarios discussed previously. As described in Section 1.3, nine COPC were identified as follows: arsenic, copper, lead, manganese, nickel, silver, thallium, tin and zinc. From a water quality perspective, thallium and tin are only measured at the analytical method detection limit therefore; modelled predictions could not be made for these COPC. Thus, the discussion provided below does not include these two COPC. The water quality predictions presented in these figures are based on the modelling carried out by SRK Consulting.

4.3.1 Rose Creek Water Quality Predictions

Figure 4.3-1 provides a comparison of the predicted metal concentrations for the various scenarios considered in the assessment at the X2 monitoring station on Rose Creek. This station is located on the north fork of Rose Creek upstream of the mine access road but downstream of the Faro pit and waste rock piles. The figure presents predicted monthly metal concentrations for a typical year. As seen on Figure 4.3-1, the lowest metal concentrations are anticipated to occur in the spring when freshwater flow dilutes the metal levels in contaminated runoff and seepage from the site.

The worse water quality is predicted for the “No Intervention” Future 3 scenario which represents maximum acid generating potential of the rock. In the “No Intervention” Future 1 scenario where the acid generating potential is less, the predicted concentrations are similar to the “Remediation” Future 3 scenario for arsenic, copper, manganese, nickel and zinc. In general, the “Remediation” Future 2 scenario and the “Treat All Flows” scenario are similar and result in better water quality than the other scenarios.

FIGURE 4.3-1
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION X2 ON ROSE CREEK

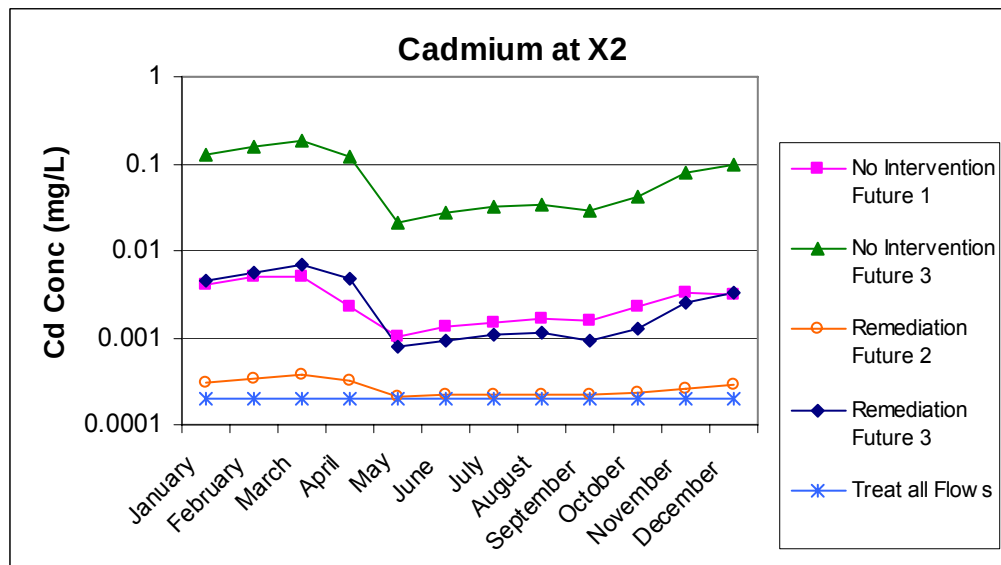
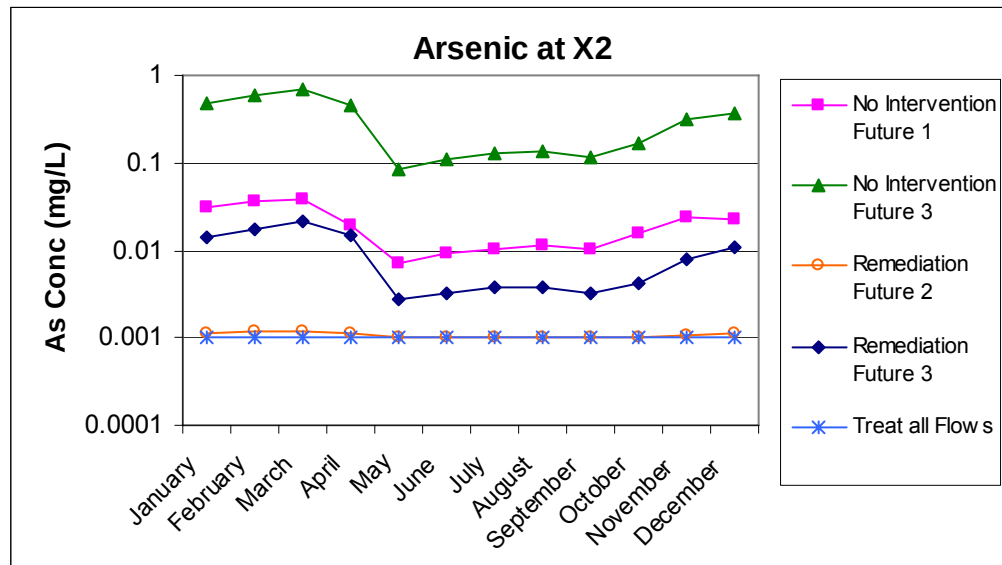


FIGURE 4.3-1 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION X2 ON ROSE CREEK

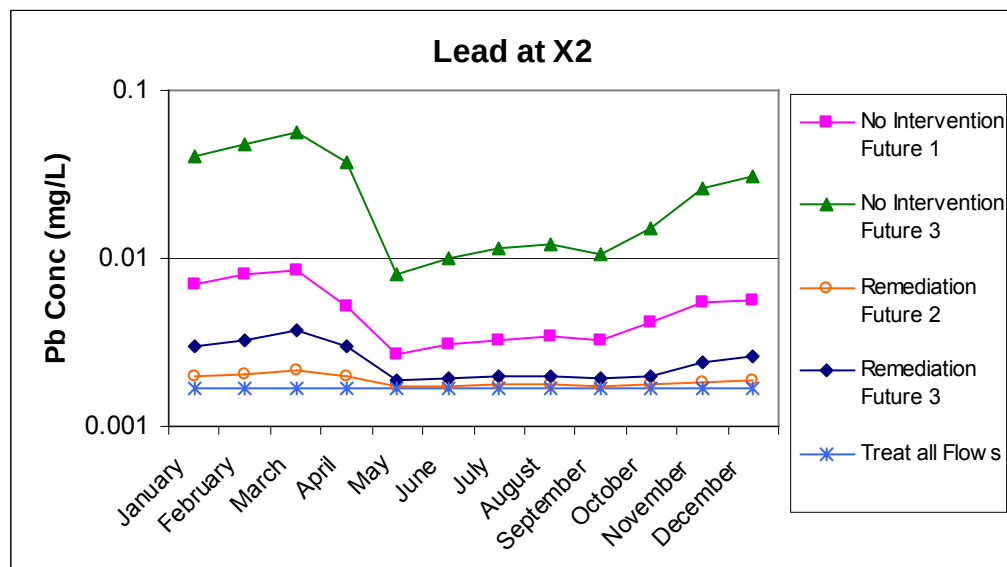
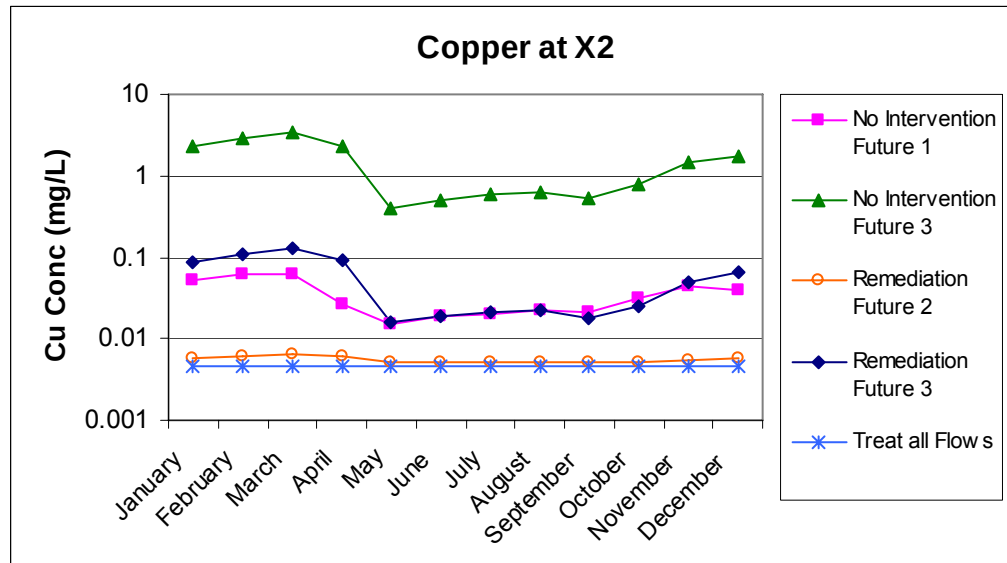


FIGURE 4.3-1 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION X2 ON ROSE CREEK

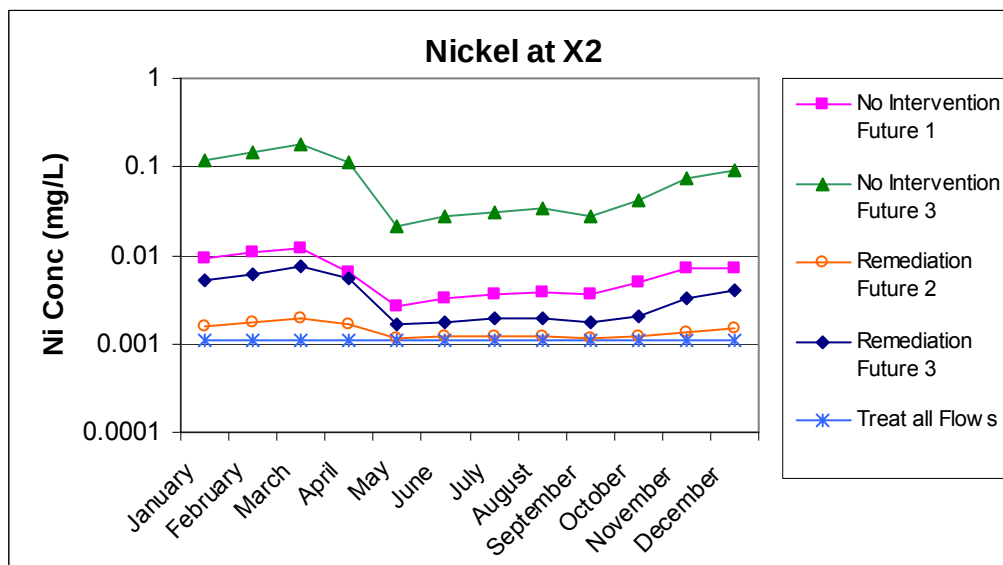
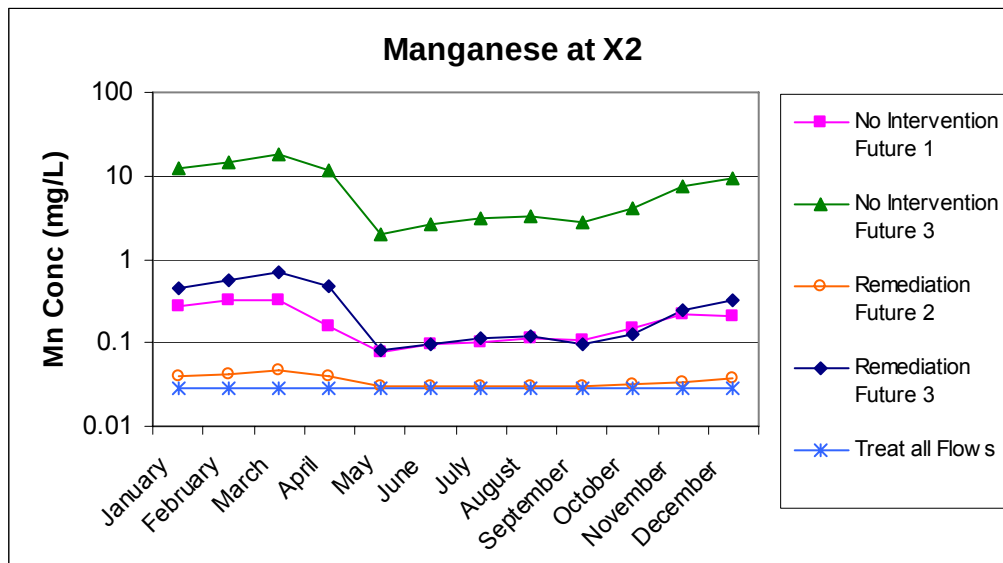


FIGURE 4.3-1 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION X2 ON ROSE CREEK

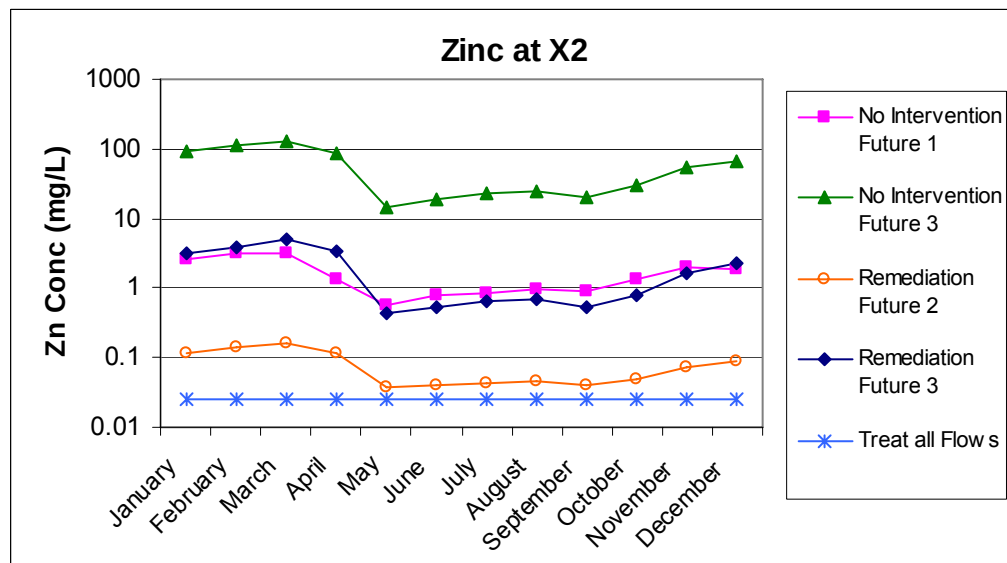
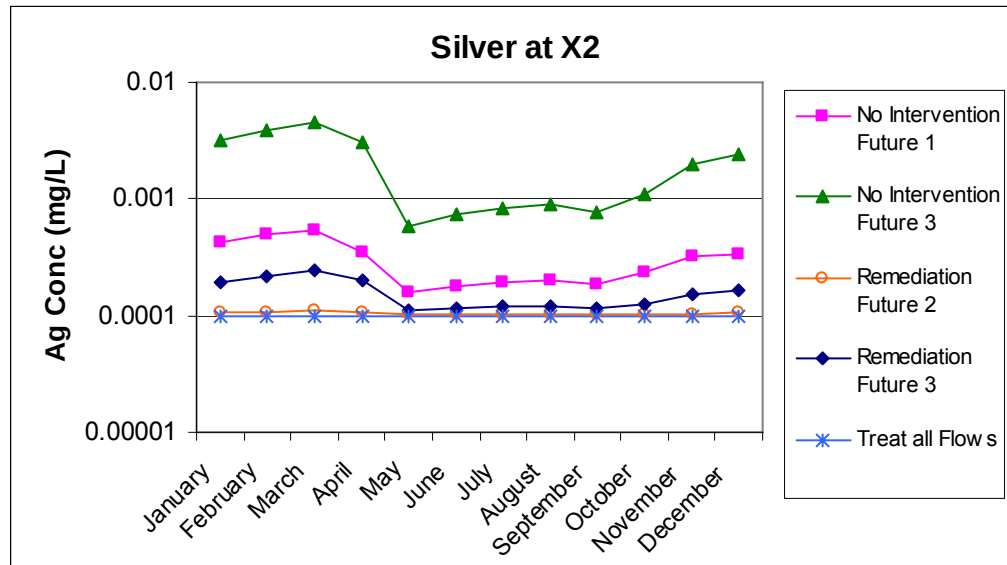


Figure 4.3-2 shows the predicted COPC concentrations for location X14 on Rose Creek. This sampling station is on Rose Creek downstream of the diversion channel and the tailings impoundment in the Rose Creek valley. Similar to the X2 location, the “No Intervention” Future 3 scenario represents the worst water quality. At this location, the predicted concentrations of lead and nickel for all the other scenarios considered in the assessment are similar. For arsenic, cadmium, manganese and silver, the predicted concentrations are similar for both “Remediation” Future 2 scenario and the “Treat All Flows” scenario. For copper and zinc, the “Treat All Flows” scenario followed by the “Remediation” Future 2 scenario results in the best water quality in Rose Creek.

FIGURE 4.3-2
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION X14 ON ROSE CREEK

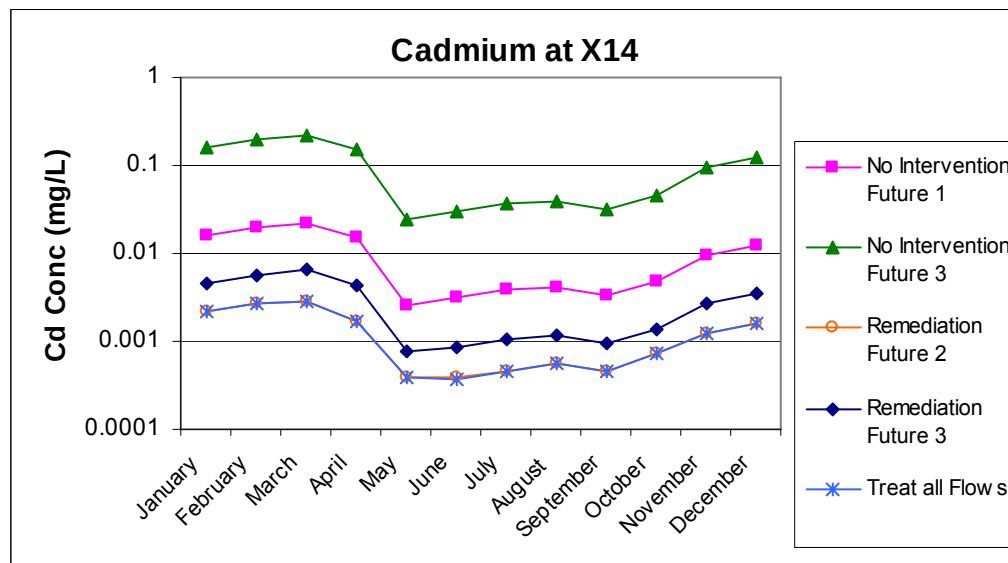
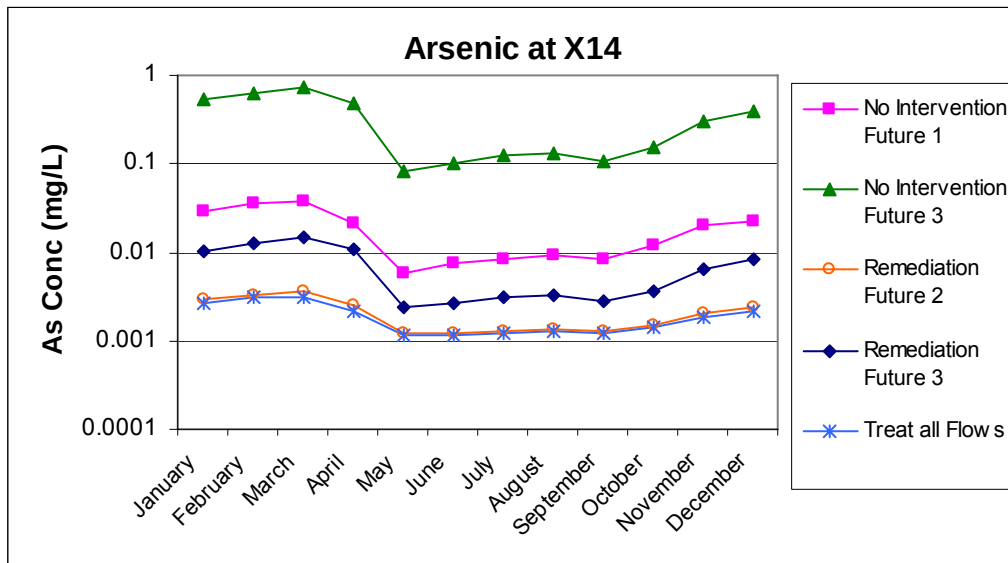


FIGURE 4.3-2 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION X14 ON ROSE CREEK

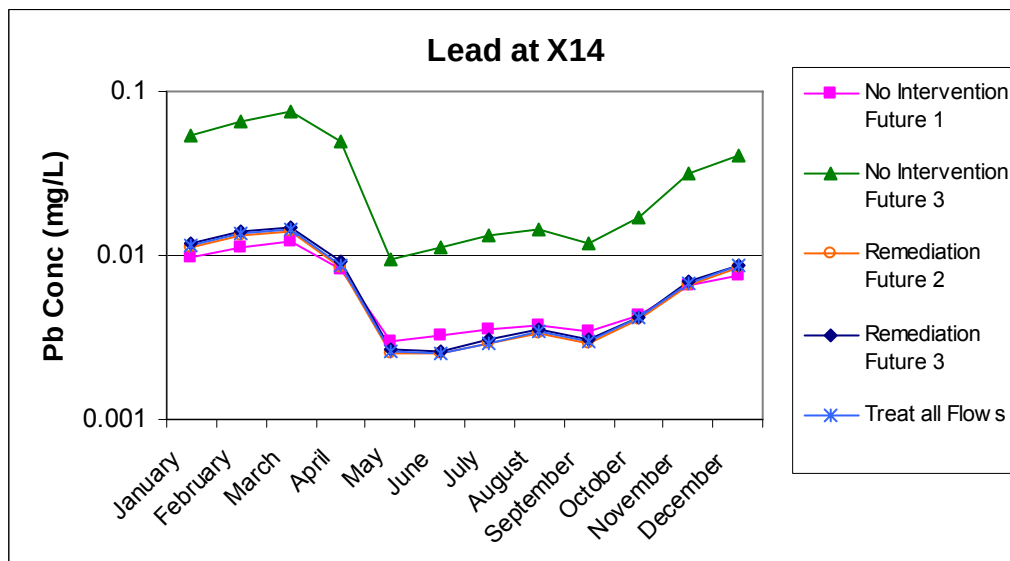
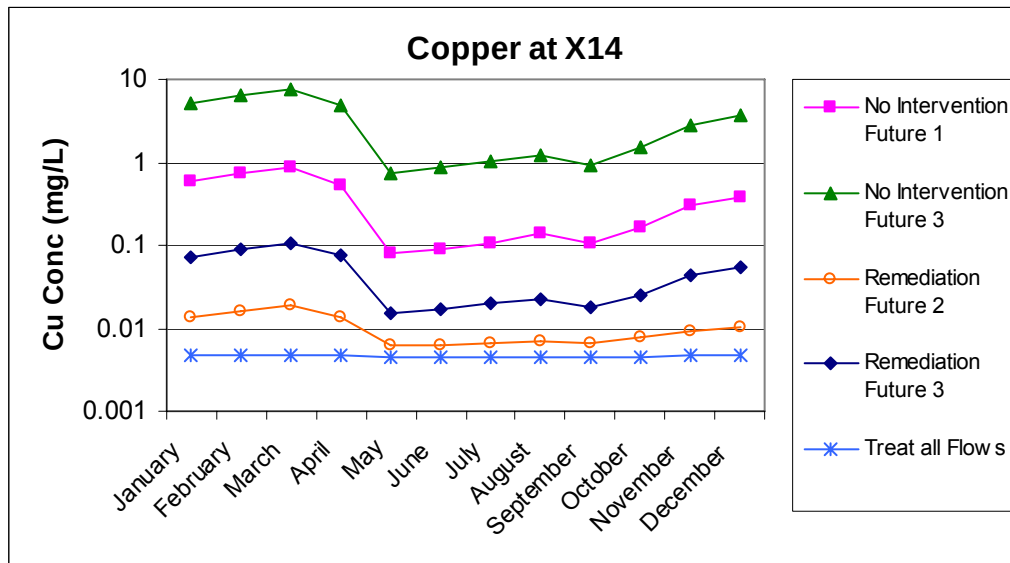


FIGURE 4.3-2 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION X14 ON ROSE CREEK

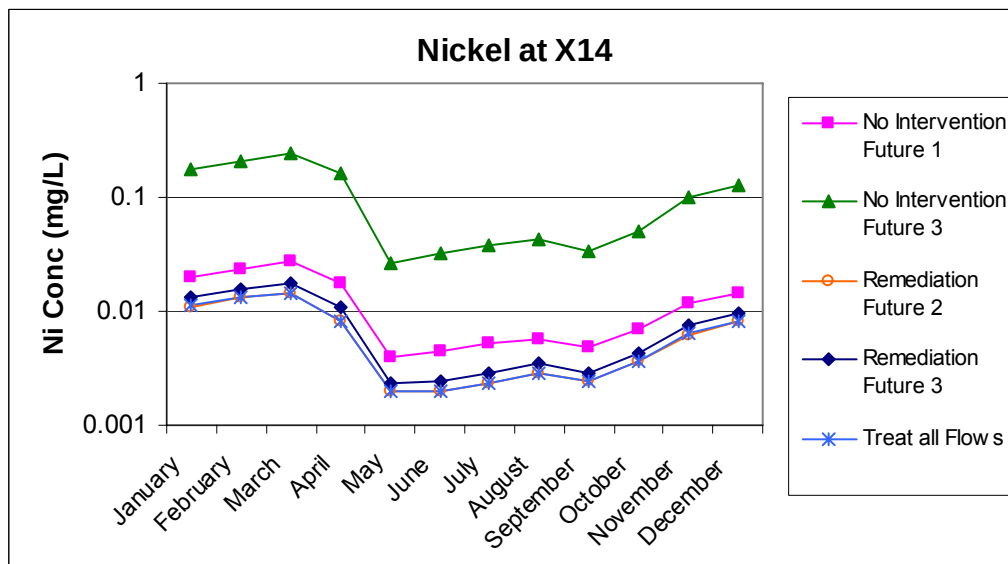
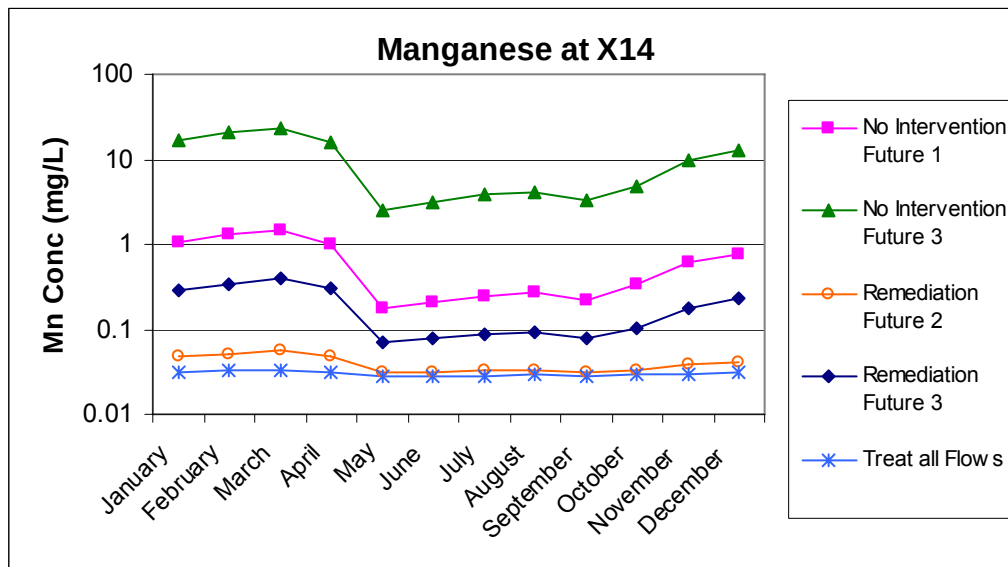
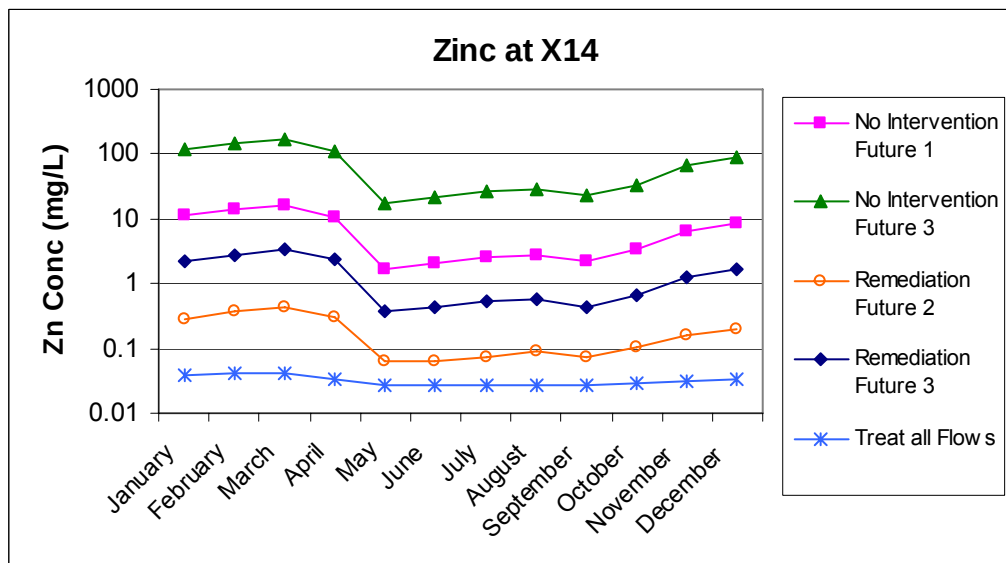
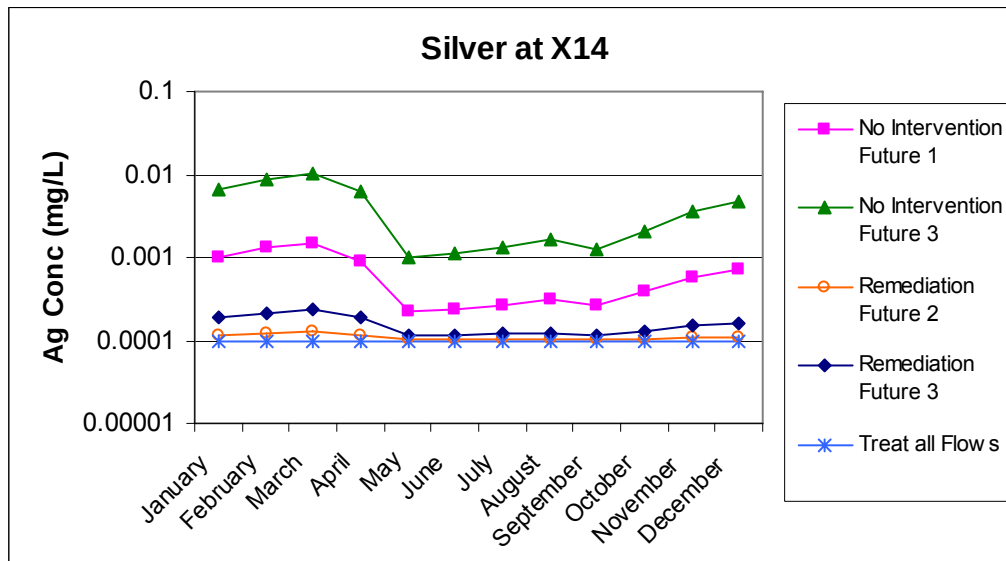


FIGURE 4.3-2 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION X14 ON ROSE CREEK



4.3.2 Vangorda Creek Water Quality Predictions

Figure 4.3-3 provides a comparison of the predicted concentrations for the various scenarios considered in the assessment at the V27 monitoring station on Vangorda Creek. This station is located on the Main Stem of Vangorda Creek (Upper) downstream of the Grum and Vangorda waste rock dumps and pits.

As seen in Figure 4.3-3, the concentrations of arsenic and silver are the same for the two “No Intervention” scenarios. The “Remediation” scenarios and “Treat All Flows” scenario also results in the same concentrations. The water quality predictions for these scenarios are better than the “No Intervention” scenarios. Cadmium, lead and nickel concentrations show similar trends in the “No Intervention” Future 1 and Future 3 scenarios and are higher than predicted for the “Remediation” Future 1 and Future 2 and “Treat All Flows” scenarios. These scenarios have the same water quality. For copper, the “Remediation” Future 2 scenario is predicted to have the best water quality; however, this is because the copper background values are lower than those considered for the “Treat All Flows” scenario. As discussed in Section 2, there was a discrepancy in some of the copper measurements performed historically. These measurements were dropped from the data set and modelling was redone for the two “Remediation” scenarios but not for the “Treat All Flows” scenario. It is likely that if this removal of data was also considered in the “Treat All Flows” scenario, the concentrations would be similar to the “Remediation” Future 2 scenario. For manganese and zinc, the trends are similar for all scenarios with highest to lowest concentrations predicted as follows: “No Intervention” (Future 3) > “No Intervention” (Future 1) > “Remediation” (Future 3) > “Remediation” (Future 2) and “Treat All Flows”.

FIGURE 4.3-3
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION V27 ON VANGORDA CREEK

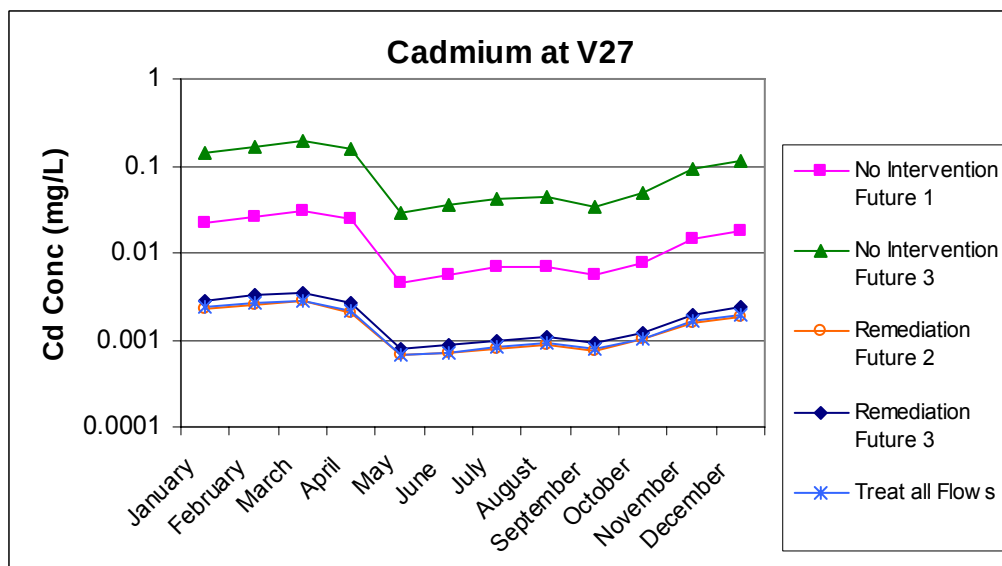
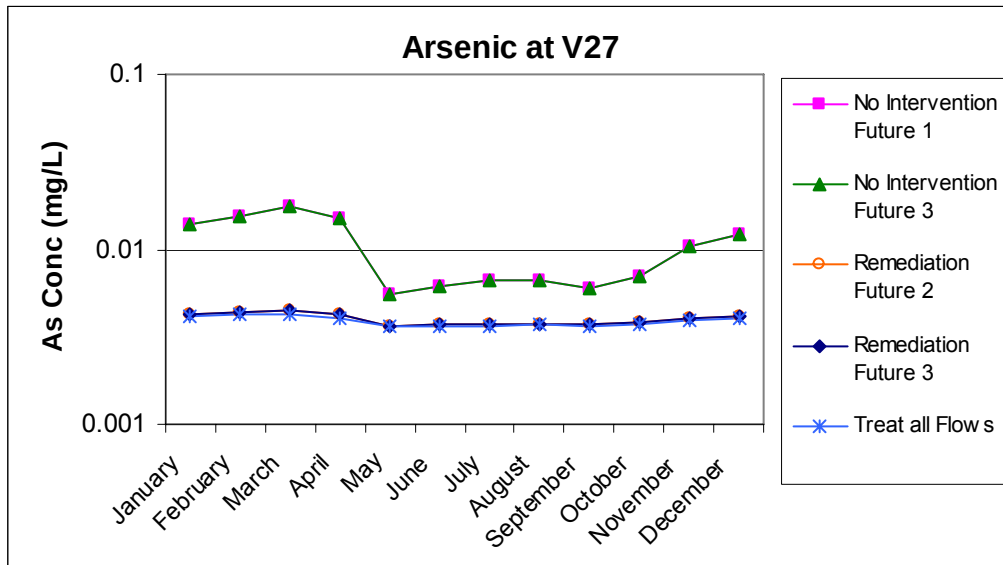


FIGURE 4.3-3 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION V27 ON VANGORDA CREEK

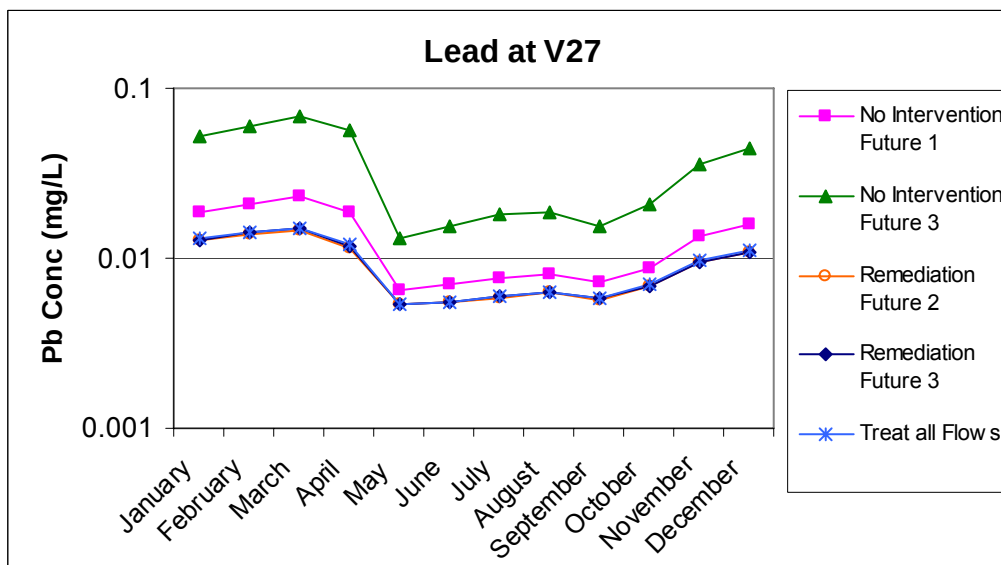
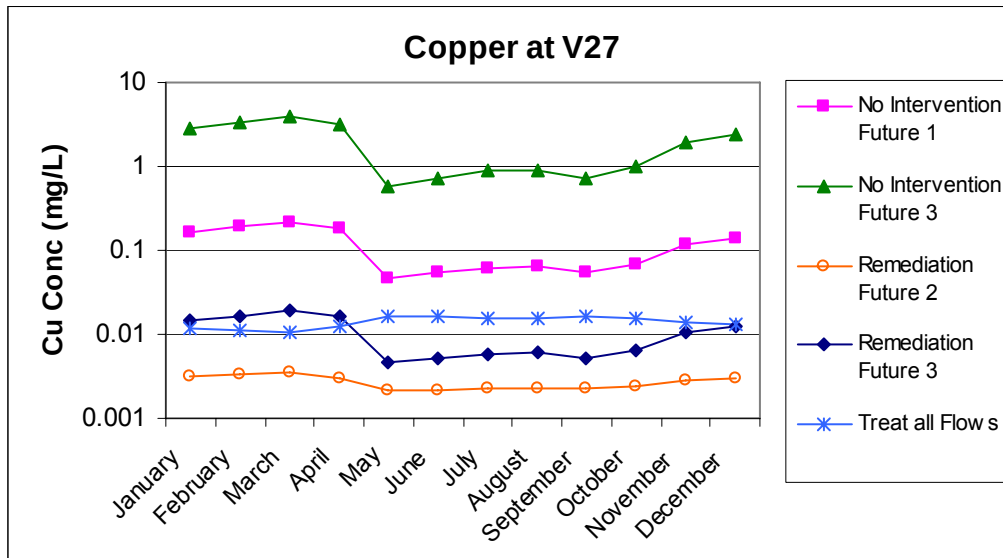


FIGURE 4.3-3 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION V27 ON VANGORDA CREEK

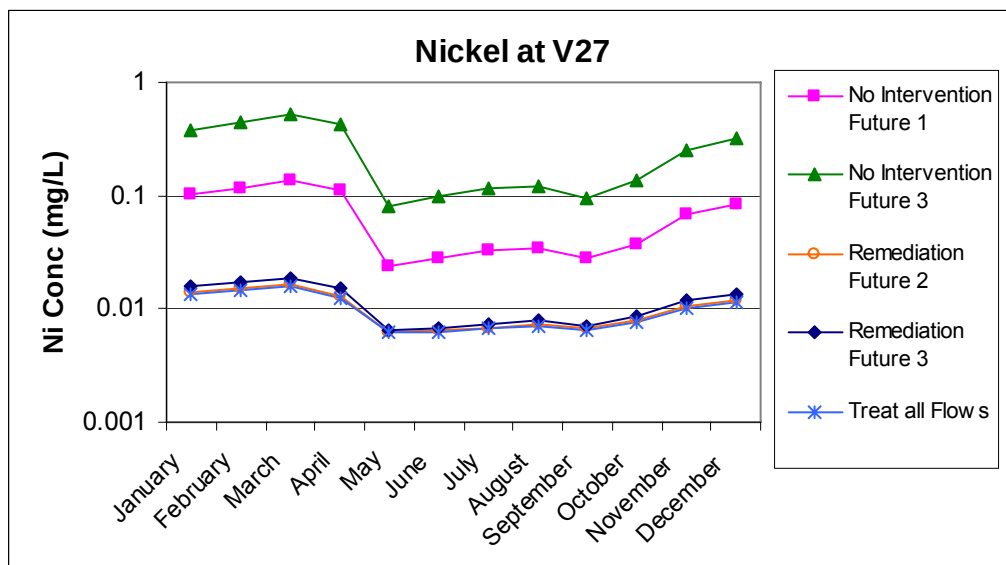
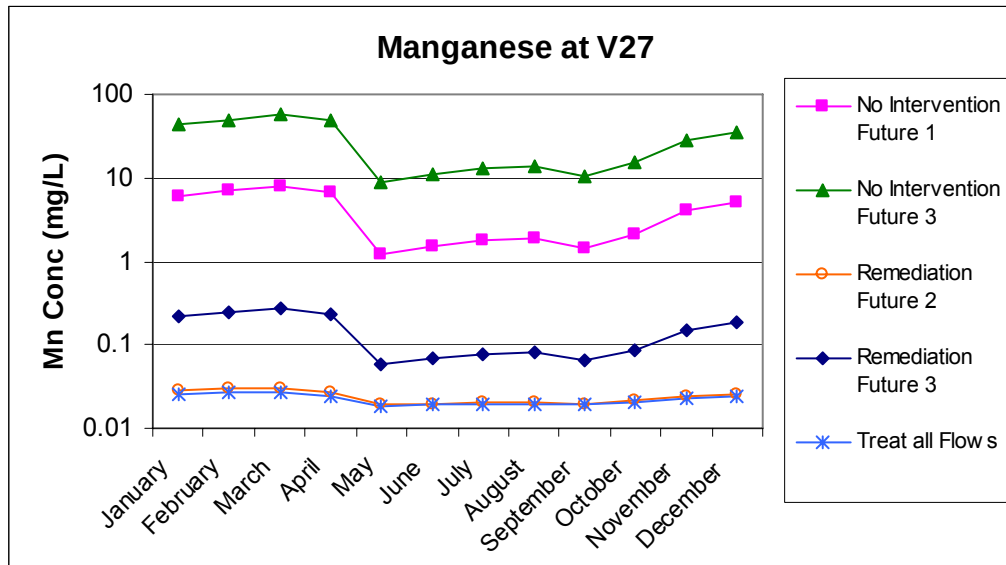


FIGURE 4.3-3 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION V27 ON VANGORDA CREEK

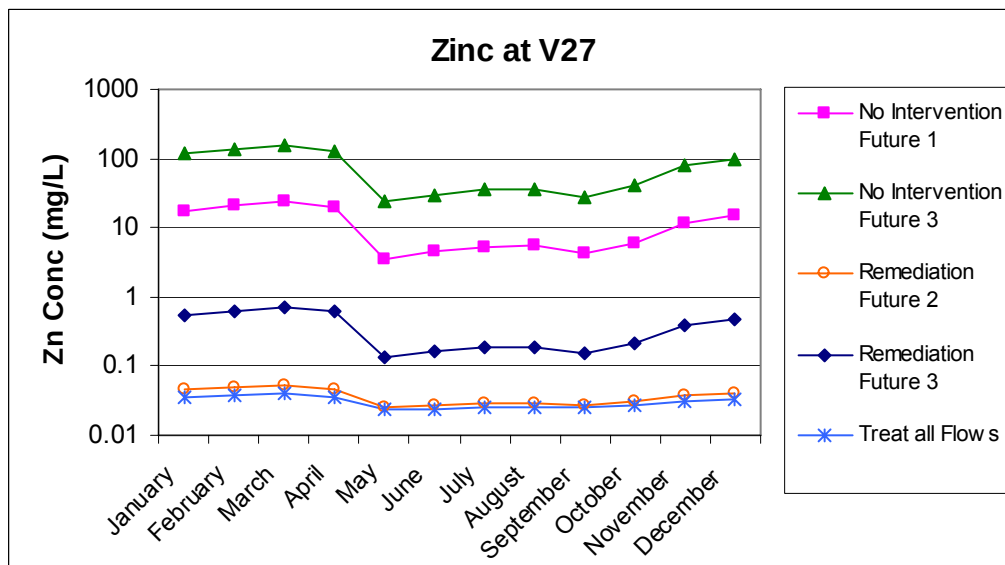
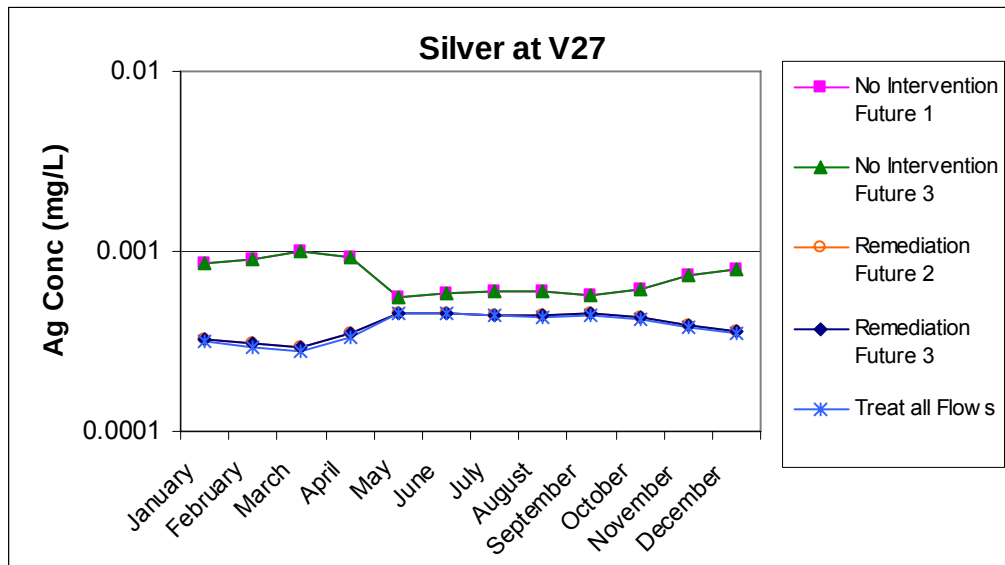


Figure 4.3-4 presents the predicted COPC concentrations for location V8 on Vangorda Creek. This sampling station is on lower Vangorda Creek above the confluence with the Pelly River. The trends in the predicted concentrations of COPC are identical to those discussed at station V27. The concentrations of arsenic and silver are the same for the two different “No Intervention” scenarios. The “Remediation” scenarios and “Treat All Flows” scenario also have similar concentrations for these COPC. The water quality predictions for these scenarios are better than the “No Intervention” scenarios. Cadmium, lead and nickel concentrations show similar trends with the “No Intervention” scenarios (Future 1 and Future 3) having worse water quality than the “Remediation” and “Treat All Flows” scenarios. These scenarios have the same water quality. For manganese and zinc, the trends are similar with the highest to lowest concentrations predicted as follows: “No Intervention” (Future 3) > “No Intervention” (Future 1) > “Remediation” (Future 3) > “Remediation” (Future 2) and “Treat All Flows”. For copper, the “Remediation” scenarios (Future 2 and Future 3) and the “Treat All Flows” scenario are predicted to have similar concentrations.

FIGURE 4.3-4
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION V8 ON VANGORDA CREEK

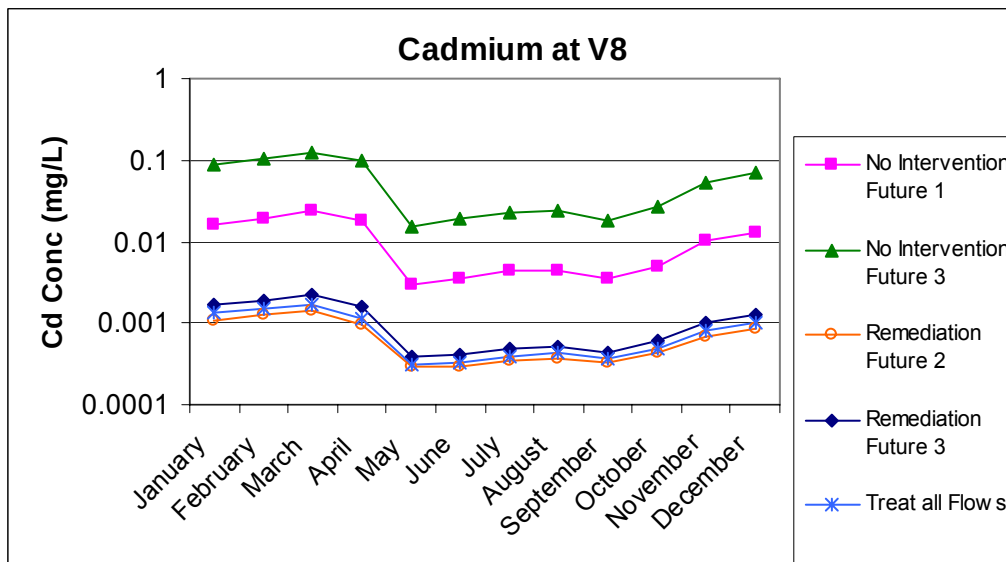
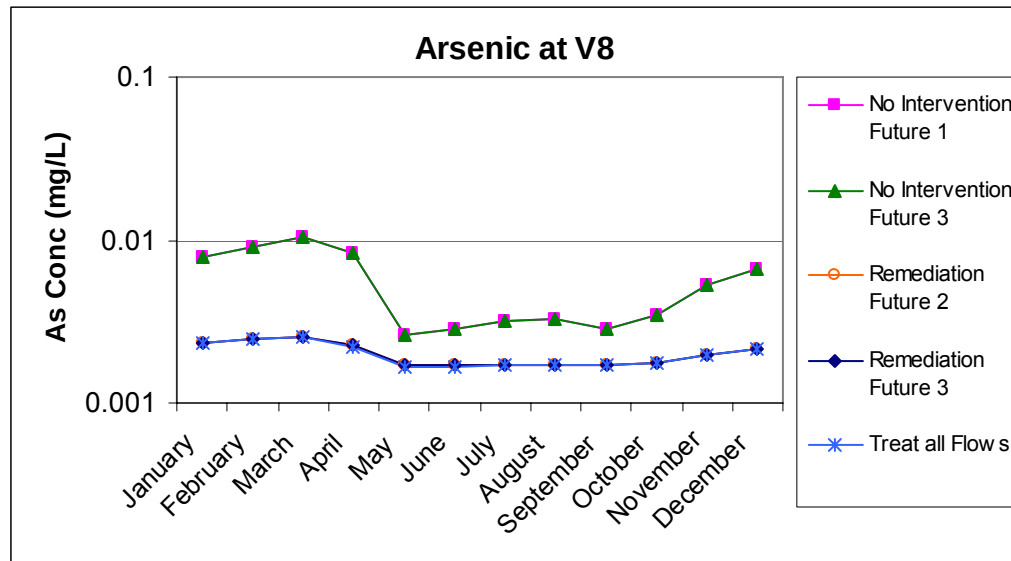


FIGURE 4.3-4 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION V8 ON VANGORDA CREEK

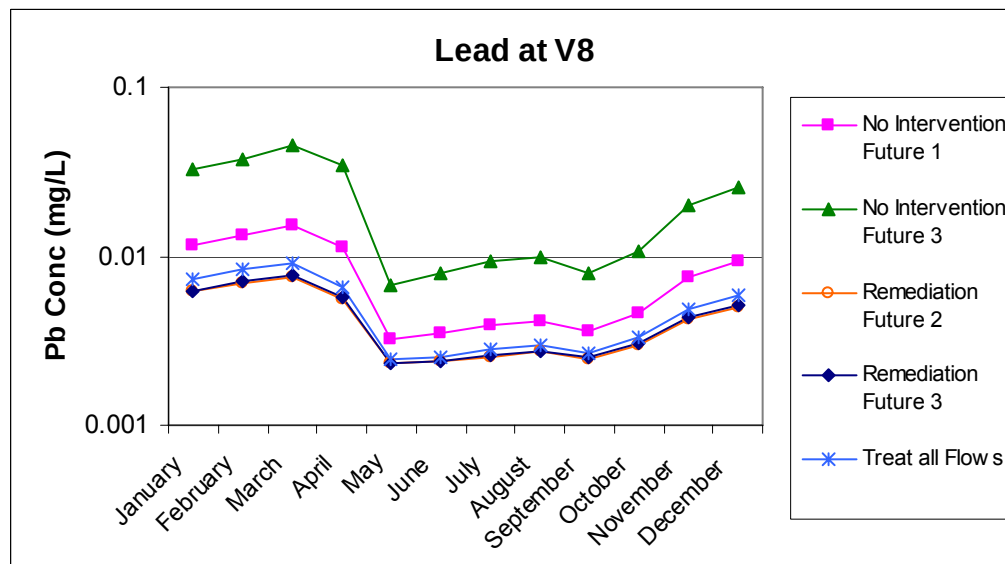
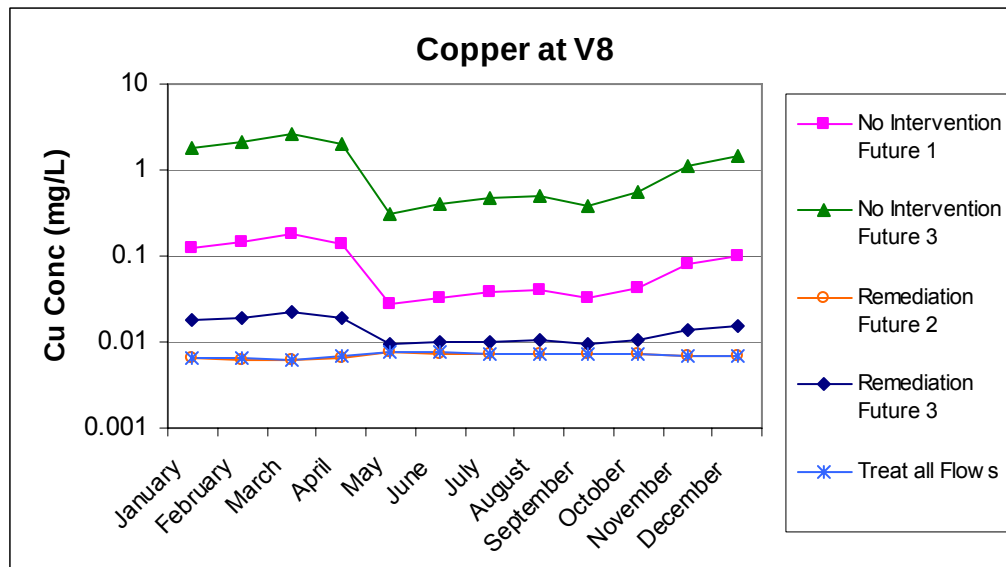


FIGURE 4.3-4 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION V8 ON VANGORDA CREEK

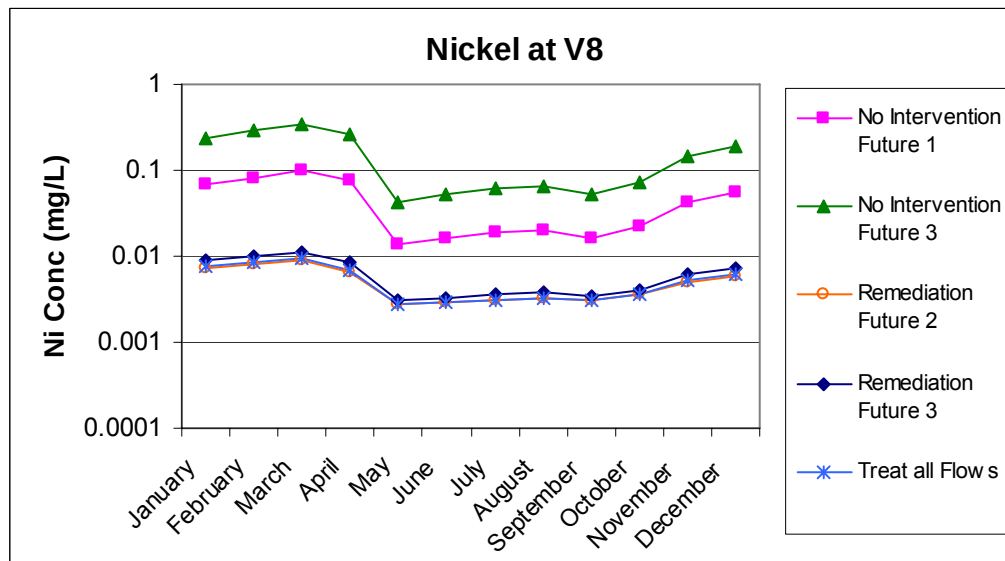
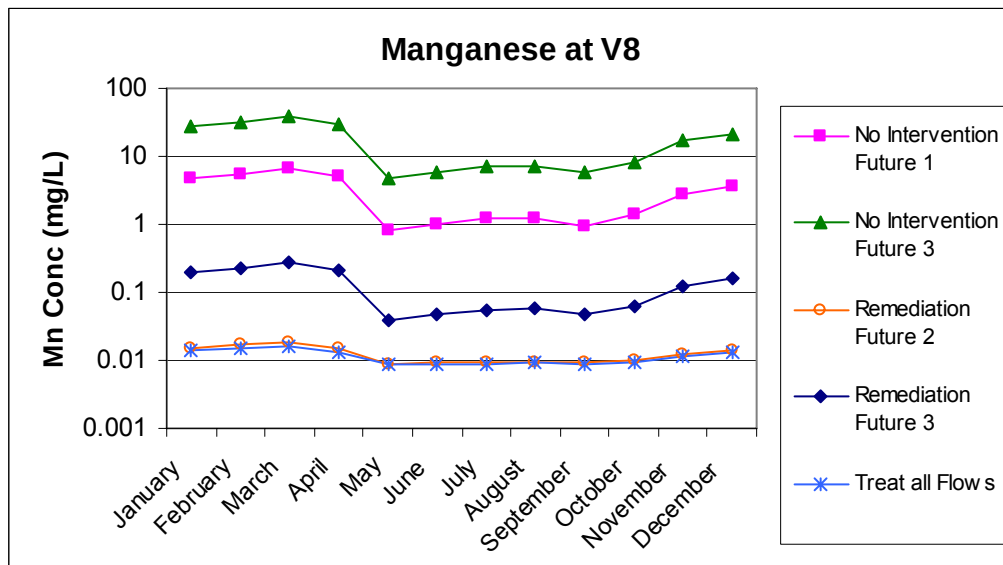
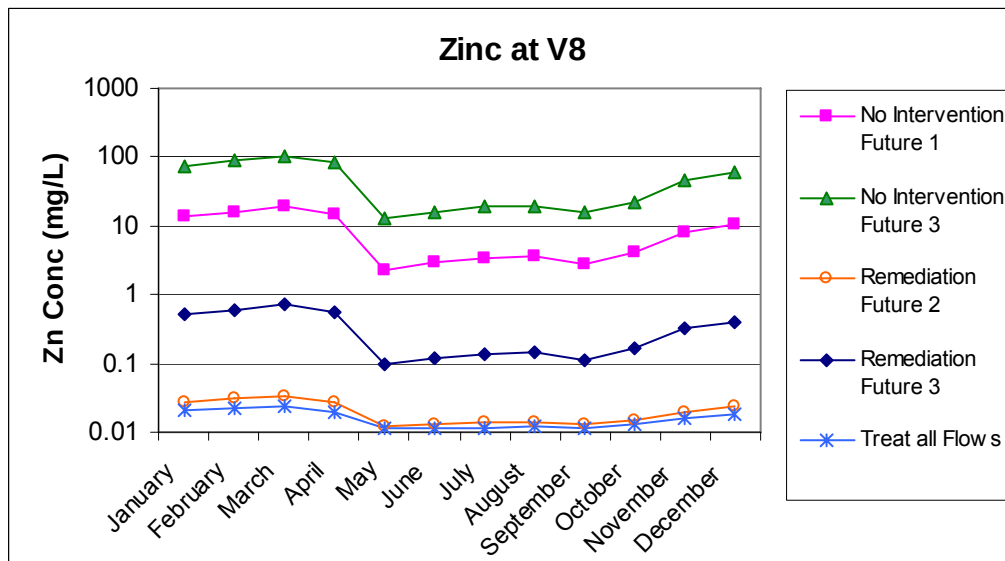
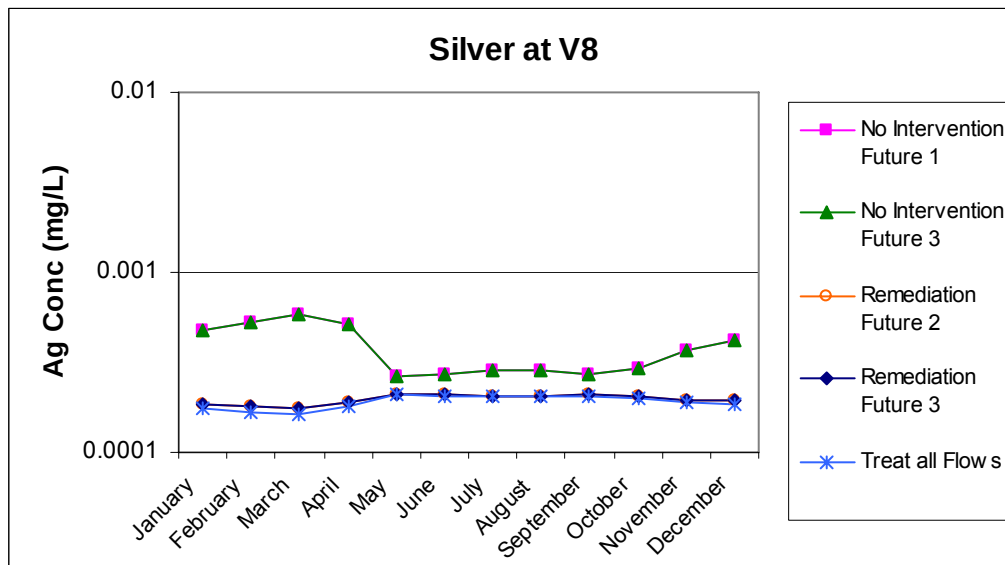


FIGURE 4.3-4 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT STATION V8 ON VANGORDA CREEK



4.3.3 Anvil Creek Water Quality Predictions

Figure 4.3-5 presents the predicted monthly mean COPC concentrations at the mouth of Anvil Creek. Water quality in Anvil Creek is better than that in either Rose Creek (Figures 4.3-1 and 4.3-2) or Vangorda Creek (Figures 4.3-3 and 4.3-4). As noted for the other water courses, the “No Intervention” scenario (Future 3) represents the worst water quality. The predicted concentrations of lead, nickel and silver in Anvil Creek for all the other scenarios considered in the assessment are similar. For arsenic, cadmium, copper, manganese and zinc, the predicted concentrations are similar for the “Remediation” scenario (Future 2) and the “No Intervention” scenario.

FIGURE 4.3-5
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT THE MOUTH OF ANVIL CREEK

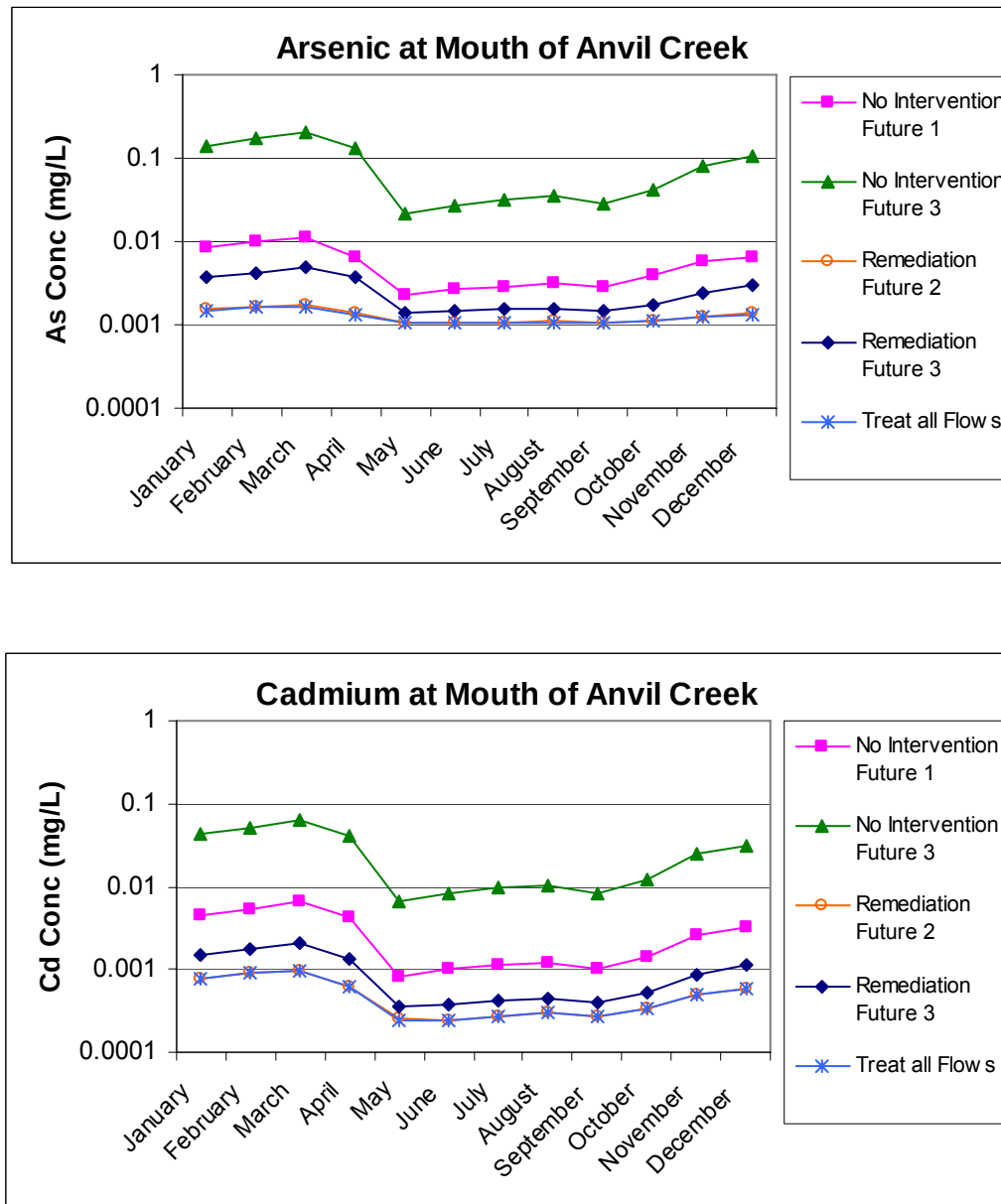


FIGURE 4.3-5 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT THE MOUTH OF ANVIL CREEK

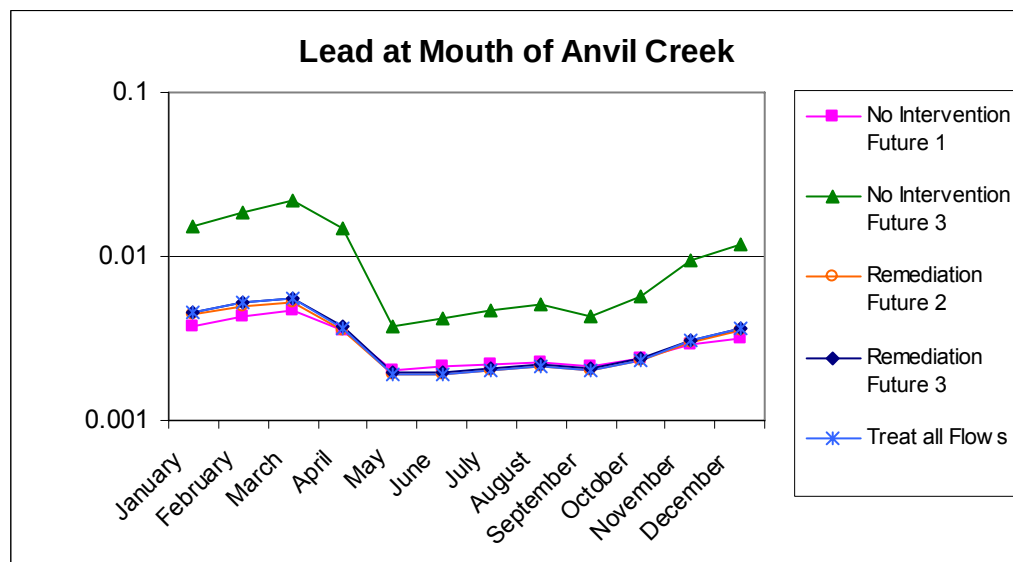
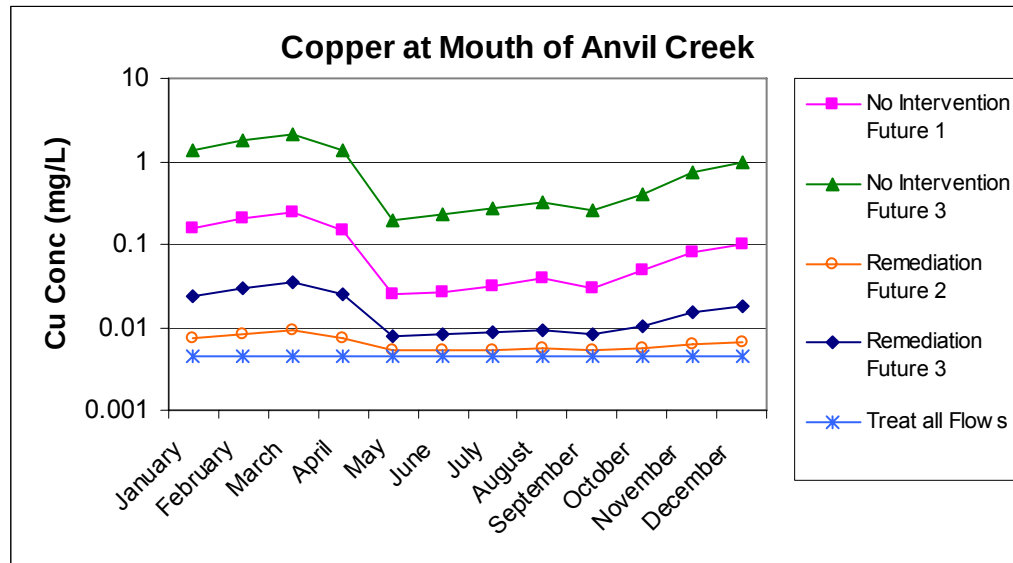


FIGURE 4.3-5 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT THE MOUTH OF ANVIL CREEK

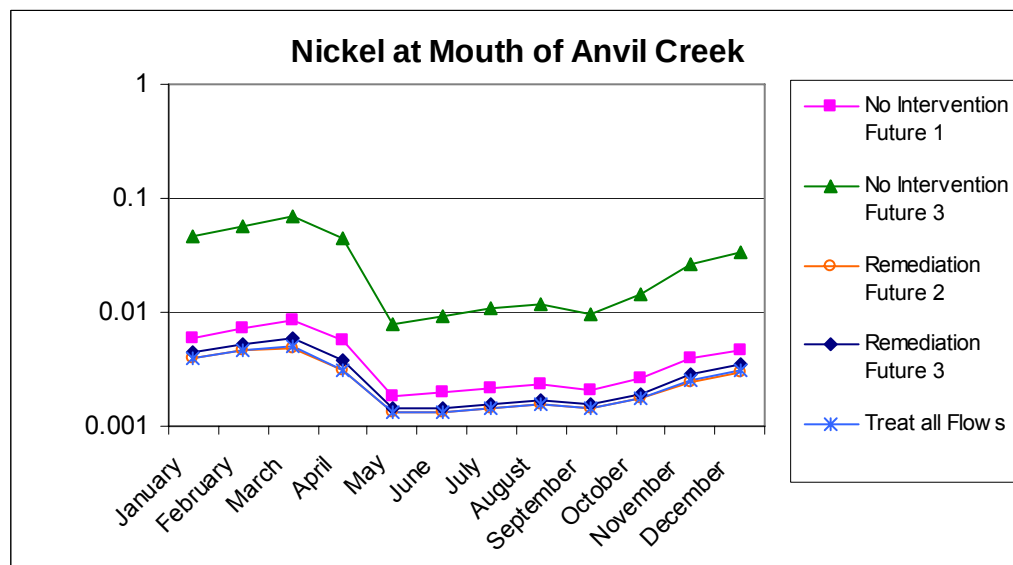
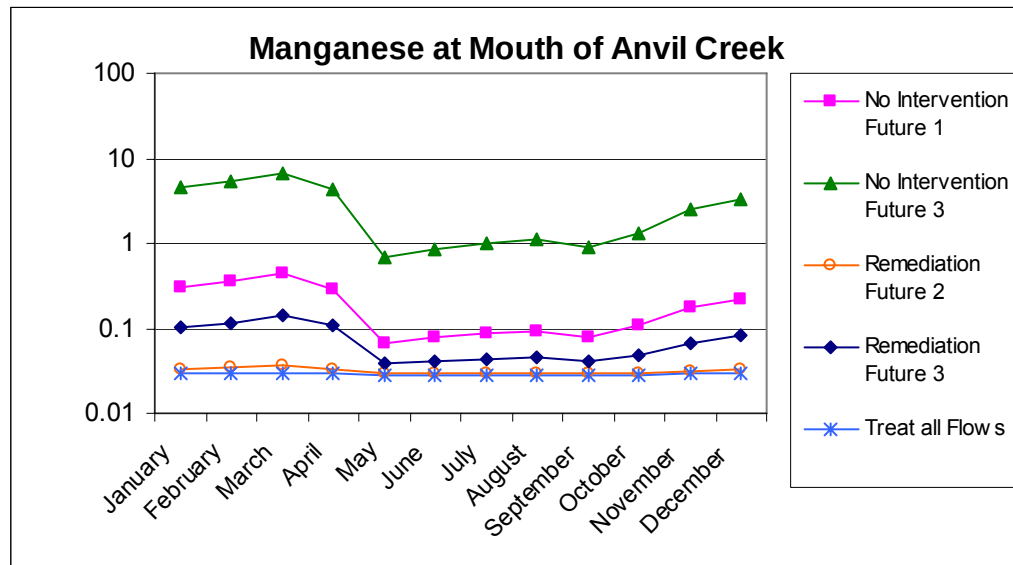
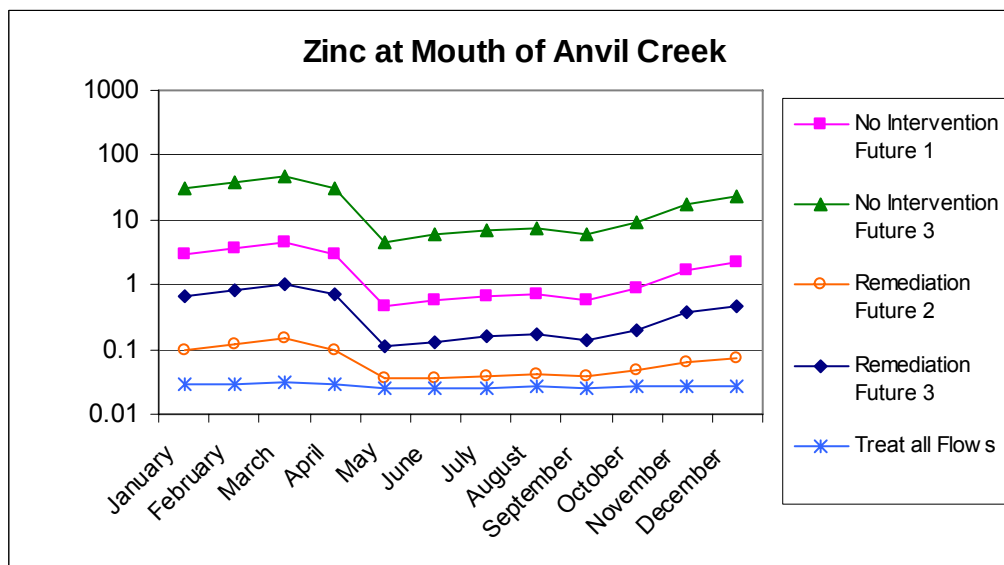
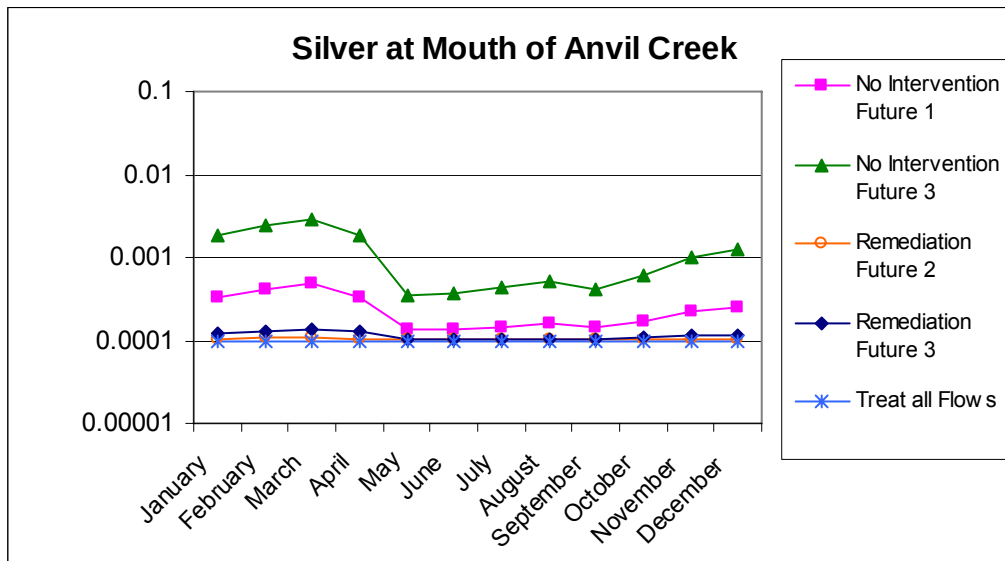


FIGURE 4.3-5 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT THE MOUTH OF ANVIL CREEK



4.3.4 Pelly River Water Quality Predictions

Figure 4.3-6 provides a comparison of the predicted mean monthly concentrations of the COPC for the various scenarios considered in the assessment at the Pelly Crossing monitoring station on the Pelly River.

As expected, the “No Intervention” Future 3 scenario results in the worst water quality. The “No Intervention” Future 1 scenario also has slightly higher concentrations of the COPC than the other scenarios. The COPC concentrations in both “Remediation” scenarios and the “Treat All Flows” scenario are similar with the exception of zinc in the Pelly River at Pelly Crossing. The zinc concentration in the “Remediation” Future 3 scenario is slightly higher than the “Remediation” Future 2 scenario which is slightly higher than the “Treat All Flows” scenarios.

FIGURE 4.3-6
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT PELLY CROSSING ON PELLY RIVER

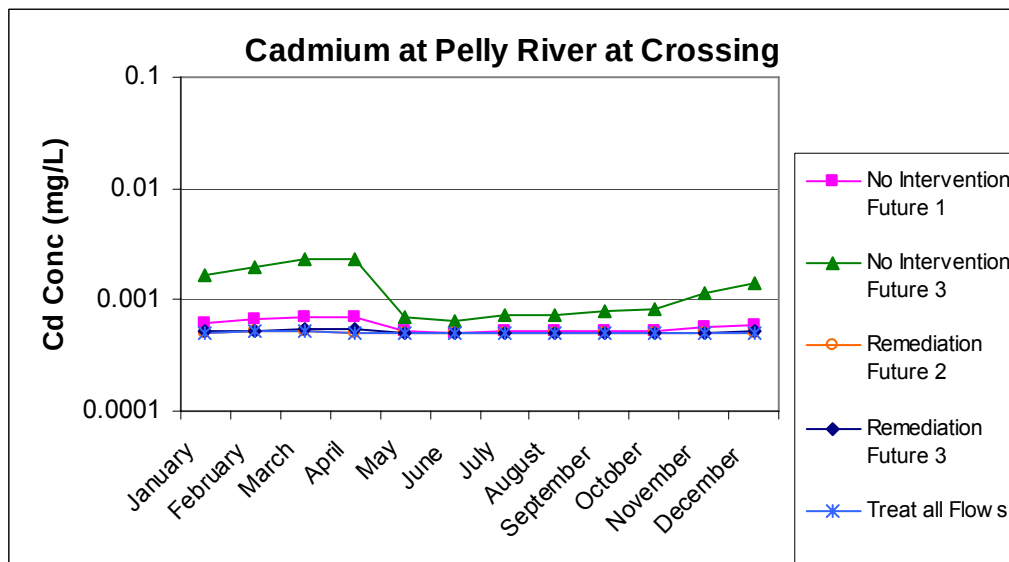
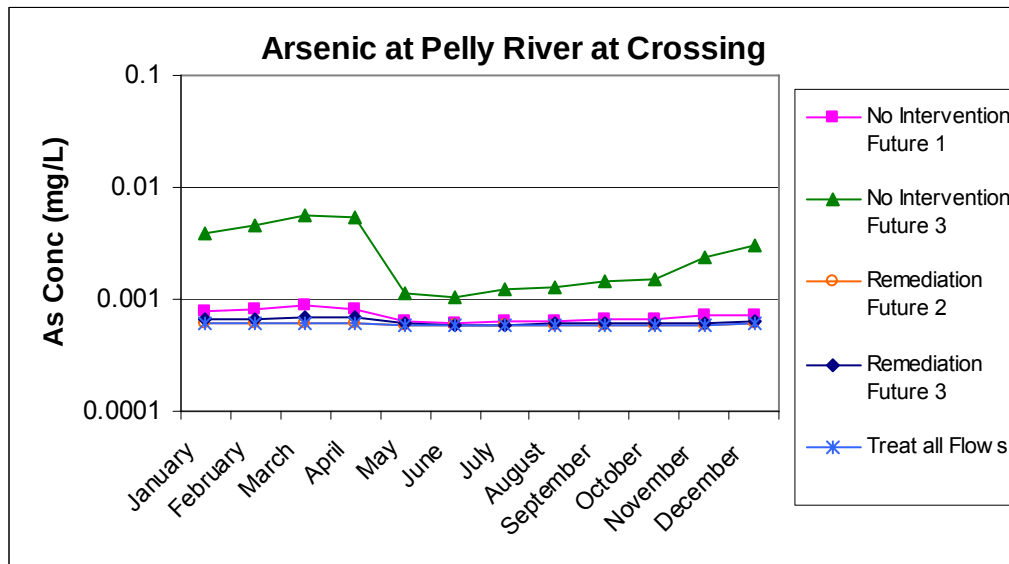


FIGURE 4.3-6 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT PELLY CROSSING ON PELLY RIVER

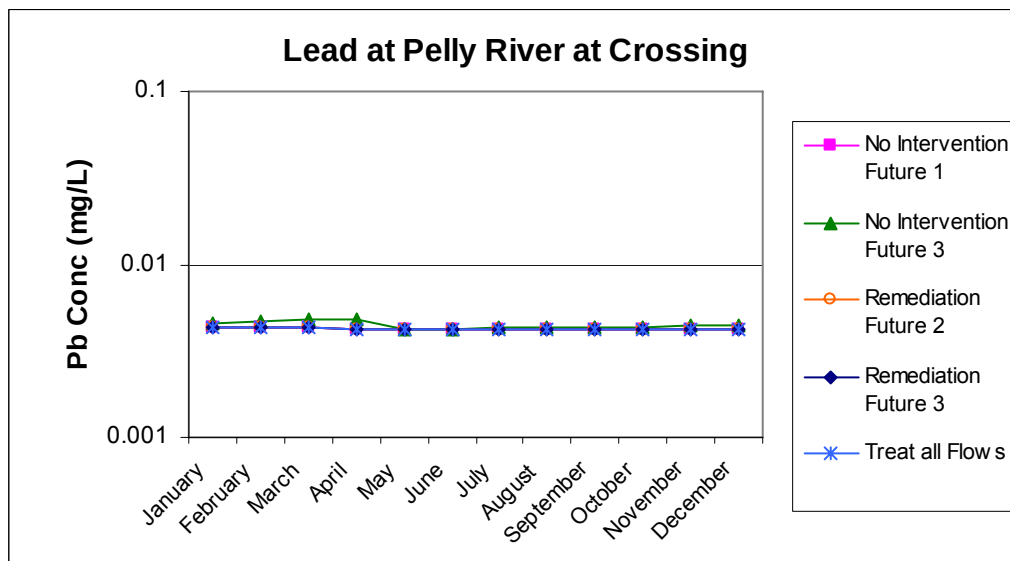
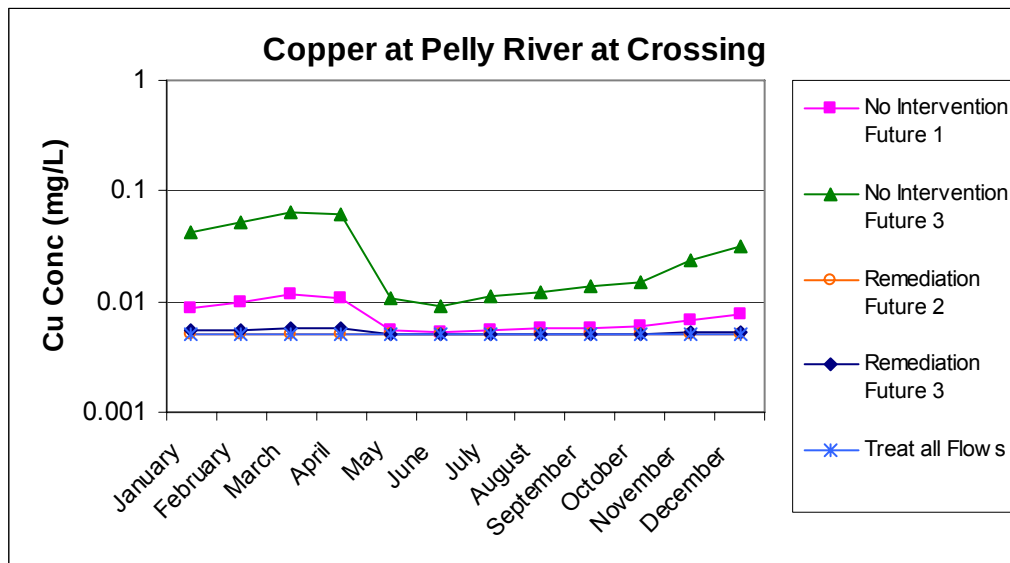


FIGURE 4.3-6 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT PELLY CROSSING ON PELLY RIVER

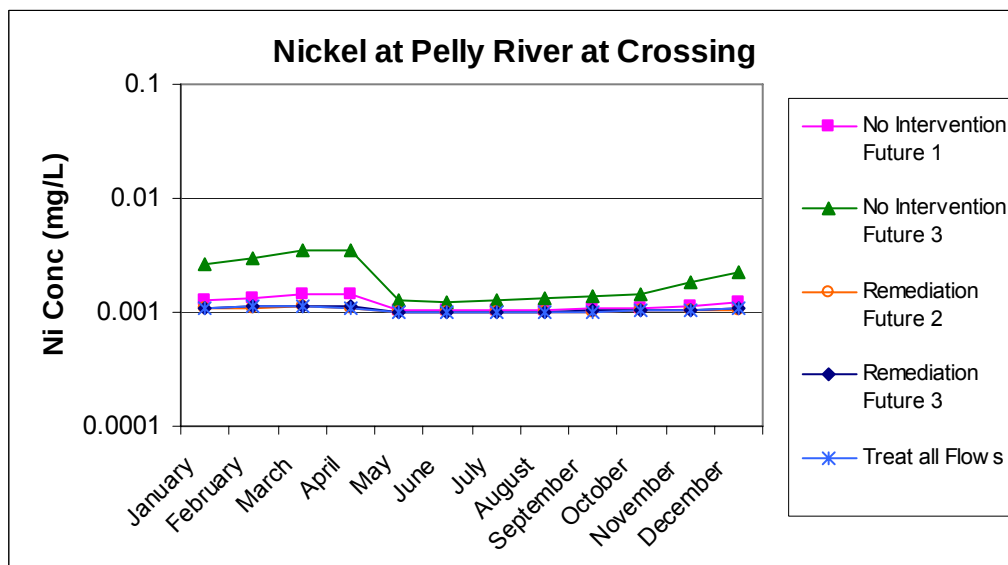
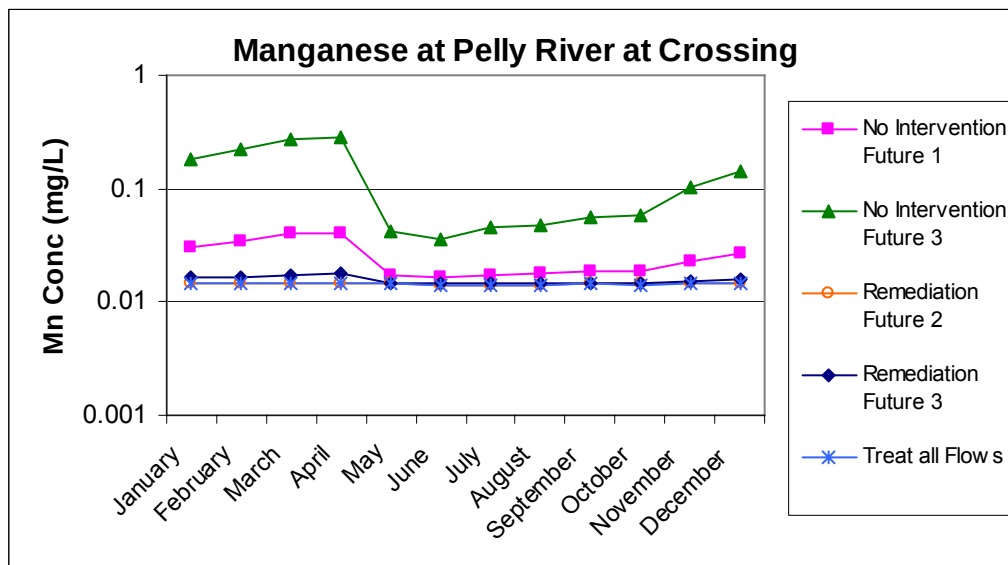
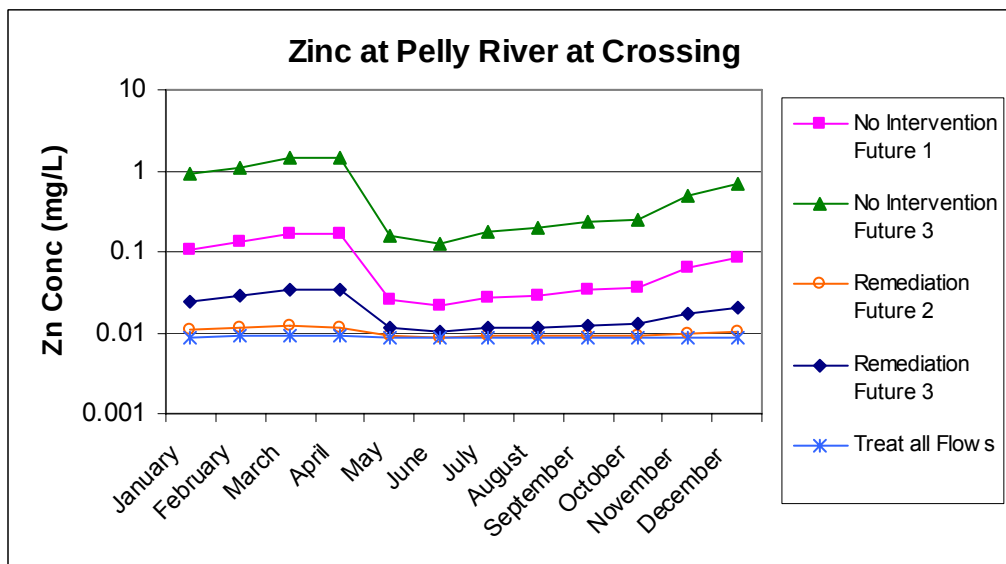
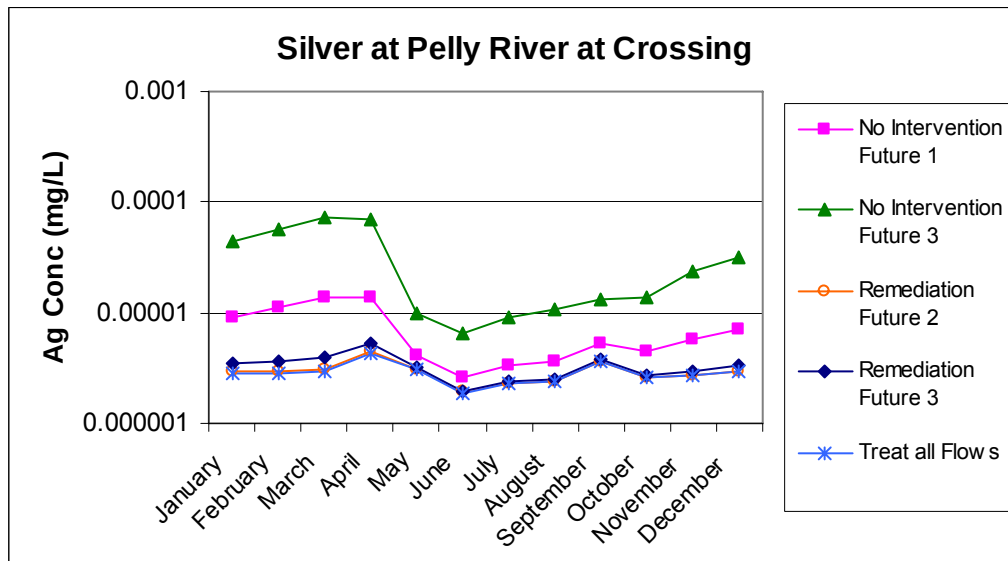


FIGURE 4.3-6 (Cont'd)
COMPARISON OF PREDICTED COPC CONCENTRATIONS FOR DIFFERENT
SCENARIOS CONSIDERED IN ASSESSMENT
AT PELLY CROSSING ON PELLY RIVER



4.4 TERRESTRIAL INTAKES

Intakes of COPC by terrestrial animals were predicted based on the dietary characteristics of the respective animals. Appendix E provides the equations used in developing these intakes. In short, the concentrations of the various COPC in different environmental media that are part of the diet of terrestrial animals are considered in their intakes. Soil/sediment ingestion as well as water ingestion were also taken into account. Appendix F provides the breakdown by the various pathways and Appendix G provides a sample calculation for zinc.

4.4.1 “Existing” Scenario

The predicted intakes of the COPC by the various receptors are provided on Table 4.4-1. As seen in the table, depending on the terrestrial animal, different locations across the site were examined. These locations depended on the home range of the animal, for example, for caribou, which has a large home range, the whole site is considered, for a hare with a much smaller home, 4 different areas spanning the Vangorda and Faro mine sites are evaluated. These areas were selected based on data availability and home range. Van-S is the area of highest COPC concentrations and is in the vicinity of the Vangorda mine workings and Faro-S is the area of highest COPC concentrations in the vicinity of the Faro mine and workings. Background (Swim Lakes area) is also considered in the assessment.

TABLE 4.4-1
PREDICTED INTAKES BY TERRESTRIAL ANIMALS UNDER “EXISTING” SCENARIO

mg/(kg d)	Caribou Overall	Hare					Moose Overall	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Arsenic	3.76x10 ⁻²	3.42x10 ⁻²	9.91x10 ⁻²	4.49x10 ⁻²	2.09x10 ⁻¹	1.23x10 ⁻¹	2.19x10 ⁻²	1.13x10 ⁻²	4.60x10 ⁻²	9.98x10 ⁻²	5.73x10 ⁻²	2.43x10 ⁻¹	1.29x10 ⁻¹
Cadmium	1.11x10 ⁻²	2.84x10 ⁻¹	2.13x10 ⁻¹	6.72x10 ⁻²	2.51x10 ⁻¹	3.10x10 ⁻¹	9.71x10 ⁻²	4.34x10 ⁻³	4.35x10 ⁻¹	3.34x10 ⁻¹	7.53x10 ⁻²	3.88x10 ⁻¹	4.84x10 ⁻¹
Copper	1.30x10 ⁻¹	4.30x10 ⁻¹	5.63x10 ⁻¹	5.01x10 ⁻¹	8.66x10 ⁻¹	6.61x10 ⁻¹	1.14x10 ⁻¹	2.18x10 ⁻¹	4.53x10 ⁻¹	6.75x10 ⁻¹	5.64x10 ⁻¹	9.33x10 ⁻¹	7.46x10 ⁻¹
Lead	2.11	6.39x10 ⁻²	1.26	1.66	1.04x10 ¹	3.86	1.79x10 ⁻¹	4.14x10 ⁻²	6.70x10 ⁻²	1.16	2.02	9.79	3.58
Manganese	3.18	6.08x10 ¹	6.06x10 ¹	3.16x10 ¹	2.40x10 ¹	8.66x10 ¹	9.01	1.88x10 ¹	6.90x10 ¹	6.89x10 ¹	2.38x10 ¹	1.91x10 ¹	8.61x10 ¹
Nickel	2.69x10 ⁻²	2.03x10 ⁻¹	3.45x10 ⁻¹	1.16x10 ⁻¹	3.01x10 ⁻¹	5.67x10 ⁻¹	6.56x10 ⁻²	9.72x10 ⁻²	2.76x10 ⁻¹	3.90x10 ⁻¹	7.75x10 ⁻²	3.82x10 ⁻¹	5.71x10 ⁻¹
Silver	5.08x10 ⁻³	5.62x10 ⁻³	1.09x10 ⁻²	5.80x10 ⁻³	1.51x10 ⁻²	1.13x10 ⁻²	1.62x10 ⁻³	2.15x10 ⁻³	5.44x10 ⁻³	1.29x10 ⁻²	5.11x10 ⁻³	1.57x10 ⁻²	7.83x10 ⁻³
Thallium	1.60x10 ⁻³	8.77x10 ⁻⁴	1.12x10 ⁻³	1.11x10 ⁻³	4.37x10 ⁻³	9.96x10 ⁻⁴	1.42x10 ⁻⁴	1.84x10 ⁻³	9.92x10 ⁻⁴	1.28x10 ⁻³	1.27x10 ⁻³	1.30x10 ⁻³	1.29x10 ⁻³
Tin	2.23x10 ⁻²	3.11x10 ⁻²	5.37x10 ⁻²	3.34x10 ⁻²	2.28x10 ⁻²	2.61x10 ⁻²	1.81x10 ⁻³	1.86x10 ⁻²	2.94x10 ⁻²	6.24x10 ⁻²	6.32x10 ⁻²	2.79x10 ⁻²	2.11x10 ⁻²
Zinc	2.97	1.46x10 ¹	2.32x10 ¹	1.25x10 ¹	4.20x10 ¹	3.12x10 ¹	5.12	1.77	2.10x10 ¹	1.54x10 ¹	1.63x10 ¹	5.72x10 ¹	4.46x10 ¹

mg/(kg d)	Mallard						Merganser					
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Arsenic	1.65x10 ⁻¹	2.12x10 ⁻¹	8.44x10 ⁻¹	1.92	8.82x10 ⁻²	3.74x10 ⁻¹	1.34x10 ⁻²	1.73x10 ⁻²	6.86x10 ⁻²	1.57x10 ⁻¹	7.17x10 ⁻³	3.04x10 ⁻²
Cadmium	2.61x10 ⁻¹	2.76x10 ⁻¹	3.59x10 ⁻¹	1.39	4.48x10 ⁻¹	5.23x10 ⁻¹	8.41x10 ⁻³	8.90x10 ⁻³	1.16x10 ⁻²	4.50x10 ⁻²	1.44x10 ⁻²	1.69x10 ⁻²
Copper	1.84x10 ⁻¹	2.05x10 ⁻¹	3.10x10 ⁻¹	6.02x10 ⁻¹	6.44x10 ⁻¹	8.39x10 ⁻¹	1.58x10 ⁻¹	1.76x10 ⁻¹	2.67x10 ⁻¹	5.17x10 ⁻¹	5.53x10 ⁻¹	7.21x10 ⁻¹
Lead	9.83x10 ⁻²	1.81x10 ⁻¹	1.62x10 ⁻¹	2.83x10 ⁻¹	1.56x10 ⁻¹	8.89x10 ⁻²	6.41x10 ⁻²	1.18x10 ⁻¹	1.06x10 ⁻¹	1.84x10 ⁻¹	1.02x10 ⁻¹	5.81x10 ⁻²
Manganese	4.71	7.42x10 ¹	2.23	2.58	1.47	1.18x10 ¹	1.52	2.39x10 ¹	7.20x10 ⁻¹	8.31x10 ⁻¹	4.73x10 ⁻¹	3.80
Nickel	3.05x10 ⁻²	6.96x10 ⁻²	1.33x10 ⁻¹	2.04x10 ⁻¹	2.24x10 ⁻²	1.57x10 ⁻¹	2.01x10 ⁻²	4.57x10 ⁻²	8.73x10 ⁻²	1.34x10 ⁻¹	1.47x10 ⁻²	1.03x10 ⁻¹
Silver	4.68x10 ⁻³	1.39x10 ⁻²	3.69x10 ⁻²	9.40x10 ⁻³	4.68x10 ⁻³	7.61x10 ⁻³	4.38x10 ⁻³	1.30x10 ⁻²	3.46x10 ⁻²	8.81x10 ⁻³	4.38x10 ⁻³	7.13x10 ⁻³
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	1.23x10 ¹	1.08x10 ¹	5.36	3.69x10 ¹	2.29	8.66	6.25	5.47	2.72	1.87x10 ¹	1.16	4.39

TABLE 4.4-1 (Cont'd)
PREDICTED INTAKES BY TERRESTRIAL ANIMALS UNDER “EXISTING” SCENARIO

mg/(kg d)	Scaup						Hoary Marmot					Bear			Wolf
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall
Arsenic	2.87x10 ⁻¹	3.70x10 ⁻¹	1.47	3.35	1.54x10 ⁻¹	6.52x10 ⁻¹	1.08x10 ⁻²	6.08x10 ⁻²	1.24x10 ⁻²	9.05x10 ⁻²	5.48x10 ⁻²	6.13x10 ⁻³	3.19x10 ⁻²	3.23x10 ⁻²	2.83x10 ⁻³
Cadmium	2.42x10 ⁻¹	2.56x10 ⁻¹	3.34x10 ⁻¹	1.29	4.16x10 ⁻¹	4.87x10 ⁻¹	2.79x10 ⁻²	1.54x10 ⁻²	3.70x10 ⁻²	1.97x10 ⁻²	2.45x10 ⁻²	9.96x10 ⁻³	1.02x10 ⁻²	7.50x10 ⁻³	1.14x10 ⁻³
Copper	4.43x10 ⁻¹	4.93x10 ⁻¹	7.47x10 ⁻¹	1.45	1.55	2.02	3.27x10 ⁻¹	3.23x10 ⁻¹	3.68x10 ⁻¹	4.85x10 ⁻¹	3.97x10 ⁻¹	1.51x10 ⁻¹	1.86x10 ⁻¹	2.06x10 ⁻¹	2.13x10 ⁻²
Lead	3.18x10 ⁻¹	5.87x10 ⁻¹	5.25x10 ⁻¹	9.16x10 ⁻¹	5.05x10 ⁻¹	2.88x10 ⁻¹	2.73x10 ⁻²	7.04x10 ⁻¹	4.59x10 ⁻¹	5.55	1.81	2.33x10 ⁻²	2.56x10 ⁻¹	2.21	1.70x10 ⁻¹
Manganese	9.09	1.43x10 ²	4.31	4.97	2.83	2.28x10 ¹	3.82x10 ¹	3.64x10 ¹	3.98x10 ¹	2.65x10 ¹	7.23x10 ¹	8.93	1.72x10 ¹	1.19x10 ¹	2.18x10 ⁻¹
Nickel	9.83x10 ⁻²	2.24x10 ⁻¹	4.28x10 ⁻¹	6.57x10 ⁻¹	7.21x10 ⁻²	5.06x10 ⁻¹	6.19x10 ⁻²	1.88x10 ⁻¹	1.43x10 ⁻¹	1.20x10 ⁻¹	4.79x10 ⁻¹	2.42x10 ⁻²	7.36x10 ⁻²	4.39x10 ⁻²	5.79x10 ⁻³
Silver	4.47x10 ⁻³	1.33x10 ⁻²	3.53x10 ⁻²	8.99x10 ⁻³	4.47x10 ⁻³	7.27x10 ⁻³	2.93x10 ⁻³	4.79x10 ⁻³	4.41x10 ⁻³	7.12x10 ⁻³	1.25x10 ⁻²	2.40x10 ⁻³	3.00x10 ⁻³	4.47x10 ⁻³	4.06x10 ⁻⁴
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	6.58x10 ⁻⁴	7.94x10 ⁻⁴	7.72x10 ⁻⁴	7.71x10 ⁻³	5.20x10 ⁻⁴	2.24x10 ⁻⁴	3.75x10 ⁻⁴	1.21x10 ⁻³	9.75x10 ⁻⁵
Tin	n/a	n/a	n/a	n/a	n/a	n/a	2.37x10 ⁻²	1.82x10 ⁻²	2.11x10 ⁻²	9.76x10 ⁻³	2.12x10 ⁻²	7.93x10 ⁻³	9.17x10 ⁻³	7.81x10 ⁻³	2.19x10 ⁻³
Zinc	1.88x10 ¹	1.64x10 ¹	8.16	5.62x10 ¹	3.49	1.32x10 ¹	3.36	2.86x10 ¹	4.72	1.21x10 ¹	6.63	2.55	8.48	5.05	4.48

mg/(kg d)	Mink						Beaver						Fox		
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Arsenic	6.91x10 ⁻²	8.91x10 ⁻²	3.54x10 ⁻¹	8.08x10 ⁻¹	3.70x10 ⁻²	1.57x10 ⁻¹	7.94x10 ⁻³	1.72x10 ⁻²	2.56x10 ⁻²	5.39x10 ⁻²	5.95x10 ⁻³	1.37x10 ⁻²	3.78x10 ⁻³	5.57x10 ⁻²	1.47x10 ⁻²
Cadmium	9.76x10 ⁻²	1.03x10 ⁻¹	1.35x10 ⁻¹	5.17x10 ⁻¹	1.72x10 ⁻¹	2.02x10 ⁻¹	1.57x10 ⁻¹	1.57x10 ⁻¹	2.01x10 ⁻¹	7.04x10 ⁻¹	2.41x10 ⁻¹	3.18x10 ⁻¹	2.32x10 ⁻²	2.15x10 ⁻²	8.41x10 ⁻³
Copper	3.28x10 ⁻¹	3.64x10 ⁻¹	5.53x10 ⁻¹	1.07	1.15	1.49	7.06x10 ⁻²	8.45x10 ⁻²	9.39x10 ⁻²	1.70x10 ⁻¹	1.56x10 ⁻¹	2.14x10 ⁻¹	2.93x10 ⁻²	4.23x10 ⁻²	5.70x10 ⁻²
Lead	2.14x10 ⁻¹	4.17x10 ⁻¹	3.53x10 ⁻¹	6.18x10 ⁻¹	3.39x10 ⁻¹	1.96x10 ⁻¹	4.44x10 ⁻²	2.20x10 ⁻¹	7.18x10 ⁻²	1.39x10 ⁻¹	6.91x10 ⁻²	5.56x10 ⁻²	8.99x10 ⁻³	9.60x10 ⁻²	8.76x10 ⁻¹
Manganese	4.02	6.34x10 ¹	1.91	2.20	1.25	1.01x10 ¹	6.79	3.24x10 ¹	6.53	6.08	6.45	7.05	8.63x10 ⁻¹	9.25x10 ⁻¹	7.97x10 ⁻¹
Nickel	6.50x10 ⁻²	1.48x10 ⁻¹	2.83x10 ⁻¹	4.34x10 ⁻¹	4.77x10 ⁻²	3.35x10 ⁻¹	3.44x10 ⁻²	5.31x10 ⁻²	6.85x10 ⁻²	1.01x10 ⁻¹	3.17x10 ⁻²	8.55x10 ⁻²	8.14x10 ⁻³	4.36x10 ⁻²	1.90x10 ⁻²
Silver	6.76x10 ⁻³	2.01x10 ⁻²	5.33x10 ⁻²	1.36x10 ⁻²	6.76x10 ⁻³	1.10x10 ⁻²	2.22x10 ⁻³	6.81x10 ⁻³	1.69x10 ⁻²	4.96x10 ⁻³	2.22x10 ⁻³	4.14x10 ⁻³	9.98x10 ⁻⁴	1.22x10 ⁻³	1.98x10 ⁻³
Thallium	4.05x10 ⁻⁷	2.02x10 ⁻⁶	4.05x10 ⁻⁷	5.19x10 ⁻⁷	4.05x10 ⁻⁷	5.19x10 ⁻⁷	9.02x10 ⁻⁵	9.29x10 ⁻⁵	9.02x10 ⁻⁵	1.19x10 ⁻⁴	9.02x10 ⁻⁵	1.19x10 ⁻⁴	2.00x10 ⁻⁵	3.46x10 ⁻⁵	2.51x10 ⁻⁵
Tin	1.44x10 ⁻⁵	1.05x10 ⁻⁵	1.44x10 ⁻⁵	2.48x10 ⁻⁵	1.44x10 ⁻⁵	2.48x10 ⁻⁵	1.90x10 ⁻³	4.79x10 ⁻³	1.90x10 ⁻³	2.05x10 ⁻³	1.90x10 ⁻³	2.05x10 ⁻³	1.64x10 ⁻³	3.13x10 ⁻³	2.50x10 ⁻³
Zinc	1.17x10 ¹	1.03x10 ¹	5.12	3.51x10 ¹	2.20	8.27	3.36	5.04	2.59	6.93	2.24	3.79	6.55x10 ⁻¹	8.02	3.02

In general, as expected, intakes associated with background exposures are lower than those at Faro and Vangorda. The intakes reported in the table also indicate that exposure at Vangorda is higher than at Faro.

4.4.2 “No Intervention” Scenario

The predicted intakes for the COPC for the various receptors for the “No Intervention” Future 1 scenario are provided on Table 4.4-2. For the Future 3 scenario where complete oxidation of the rock is assumed, the intakes are presented in Table 4.4-3.

4.4.3 “Remediation” Scenario

The predicted intakes of the COPC for the various receptors are provided on Table 4.4-4 for the “Remediation” Future 2 scenario and in Table 4.4-5 for the Future 3 scenario.

4.4.4 “Treat All Flows” Scenario

The predicted intakes of the COPC for the various receptors are provided on Table 4.4-6 for the “Treat All Flows” scenario.

TABLE 4.4-2
PREDICTED INTAKES FOR TERRESTRIAL ANIMALS “NO INTERVENTION” SCENARIO – FUTURE 1

mg/(kg d)	Caribou Overall	Hare					Moose Overall	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Arsenic	3.77x10 ⁻²	3.42x10 ⁻²	9.89x10 ⁻²	4.65x10 ⁻²	2.10x10 ⁻¹	1.25x10 ⁻¹	2.67x10 ⁻²	1.12x10 ⁻²	4.60x10 ⁻²	9.96x10 ⁻²	5.86x10 ⁻²	2.45x10 ⁻¹	1.30x10 ⁻¹
Cadmium	1.12x10 ⁻²	2.84x10 ⁻¹	2.15x10 ⁻¹	6.77x10 ⁻²	2.51x10 ⁻¹	3.11x10 ⁻¹	3.04x10 ⁻¹	4.75x10 ⁻³	4.35x10 ⁻¹	3.35x10 ⁻¹	7.58x10 ⁻²	3.89x10 ⁻¹	4.85x10 ⁻¹
Copper	1.33x10 ⁻¹	4.30x10 ⁻¹	5.73x10 ⁻¹	5.18x10 ⁻¹	8.83x10 ⁻¹	6.78x10 ⁻¹	7.11x10 ⁻¹	2.21x10 ⁻¹	4.53x10 ⁻¹	6.84x10 ⁻¹	5.78x10 ⁻¹	9.47x10 ⁻¹	7.60x10 ⁻¹
Lead	2.11	6.39x10 ⁻²	1.26	1.66	1.04x10 ¹	3.86	1.89x10 ⁻¹	4.16x10 ⁻²	6.70x10 ⁻²	1.16	2.02	9.79	3.58
Manganese	3.20	6.08x10 ¹	6.10x10 ¹	3.16x10 ¹	2.40x10 ¹	8.66x10 ¹	1.18x10 ¹	1.89x10 ¹	6.90x10 ¹	6.92x10 ¹	2.38x10 ¹	1.91x10 ¹	8.61x10 ¹
Nickel	2.73x10 ⁻²	2.03x10 ⁻¹	3.50x10 ⁻¹	1.17x10 ⁻¹	3.02x10 ⁻¹	5.67x10 ⁻¹	1.04x10 ⁻¹	9.90x10 ⁻²	2.76x10 ⁻¹	3.95x10 ⁻¹	7.80x10 ⁻²	3.83x10 ⁻¹	5.72x10 ⁻¹
Silver	5.09x10 ⁻³	5.62x10 ⁻³	1.10x10 ⁻²	5.82x10 ⁻³	1.51x10 ⁻²	1.14x10 ⁻²	1.96x10 ⁻³	2.17x10 ⁻³	5.44x10 ⁻³	1.29x10 ⁻²	5.13x10 ⁻³	1.57x10 ⁻²	7.84x10 ⁻³
Thallium	1.60x10 ⁻³	8.77x10 ⁻⁴	1.12x10 ⁻³	1.11x10 ⁻³	4.37x10 ⁻³	9.96x10 ⁻⁴	1.42x10 ⁻⁴	1.84x10 ⁻³	9.92x10 ⁻⁴	1.28x10 ⁻³	1.27x10 ⁻³	1.30x10 ⁻³	1.29x10 ⁻³
Tin	2.23x10 ⁻²	3.11x10 ⁻²	5.37x10 ⁻²	3.34x10 ⁻²	2.28x10 ⁻²	2.61x10 ⁻²	1.81x10 ⁻³	1.86x10 ⁻²	2.94x10 ⁻²	6.24x10 ⁻²	6.32x10 ⁻²	2.79x10 ⁻²	2.11x10 ⁻²
Zinc	3.09	1.46x10 ¹	2.43x10 ¹	1.28x10 ¹	4.23x10 ¹	3.16x10 ¹	2.16x10 ¹	2.13	2.10x10 ¹	1.63x10 ¹	1.66x10 ¹	5.75x10 ¹	4.49x10 ¹

mg/(kg d)	Mallard						Merganser					
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Arsenic	1.65x10 ⁻¹	2.89	8.44x10 ⁻¹	1.56	8.82x10 ⁻²	1.09x10 ⁻¹	1.34x10 ⁻²	2.35x10 ⁻¹	6.86x10 ⁻²	1.27x10 ⁻¹	7.17x10 ⁻³	8.87x10 ⁻³
Cadmium	2.61x10 ⁻¹	5.57	3.59x10 ⁻¹	1.29x10 ¹	4.48x10 ⁻¹	5.20x10 ⁻¹	8.41x10 ⁻³	1.80x10 ⁻¹	1.16x10 ⁻²	4.15x10 ⁻¹	1.44x10 ⁻²	1.68x10 ⁻²
Copper	1.84x10 ⁻¹	2.43x10 ¹	3.10x10 ⁻¹	1.48x10 ¹	6.44x10 ⁻¹	9.64x10 ⁻¹	1.58x10 ⁻¹	2.09x10 ¹	2.67x10 ⁻¹	1.27x10 ¹	5.53x10 ⁻¹	8.28x10 ⁻¹
Lead	9.83x10 ⁻²	2.08x10 ⁻¹	1.62x10 ⁻¹	4.73x10 ⁻¹	1.56x10 ⁻¹	1.55x10 ⁻¹	6.41x10 ⁻²	1.36x10 ⁻¹	1.06x10 ⁻¹	3.09x10 ⁻¹	1.02x10 ⁻¹	1.01x10 ⁻¹
Manganese	4.71	4.28x10 ¹	2.23	4.08x10 ²	1.47	2.64	1.52	1.38x10 ¹	7.20x10 ⁻¹	1.32x10 ²	4.73x10 ⁻¹	8.50x10 ⁻¹
Nickel	3.05x10 ⁻²	2.06x10 ⁻¹	1.33x10 ⁻¹	1.49	2.24x10 ⁻²	2.64x10 ⁻²	2.01x10 ⁻²	1.35x10 ⁻¹	8.73x10 ⁻²	9.79x10 ⁻¹	1.47x10 ⁻²	1.73x10 ⁻²
Silver	4.68x10 ⁻³	2.20x10 ⁻²	3.69x10 ⁻²	3.39x10 ⁻²	4.68x10 ⁻³	3.26x10 ⁻⁴	4.38x10 ⁻³	2.06x10 ⁻²	3.46x10 ⁻²	3.18x10 ⁻²	4.38x10 ⁻³	3.06x10 ⁻⁴
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	1.23x10 ¹	1.14x10 ³	5.36	3.15x10 ³	2.29	2.03x10 ¹	6.25	5.78x10 ²	2.72	1.60x10 ³	1.16	1.03x10 ¹

TABLE 4.4-2 (Cont'd)
PREDICTED INTAKES FOR TERRESTRIAL ANIMALS “NO INTERVENTION” SCENARIO – FUTURE 1

mg/(kg d)	Scaup						Hoary Marmot					Bear			Wolf Overall
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	
Arsenic	2.87x10 ⁻¹	5.04	1.47	2.72	1.54x10 ⁻¹	1.90x10 ⁻¹	1.08x10 ⁻²	6.06x10 ⁻²	1.39x10 ⁻²	9.20x10 ⁻²	5.62x10 ⁻²	6.15x10 ⁻³	2.97x10 ⁻²	4.85x10 ⁻²	2.94x10 ⁻³
Cadmium	2.42x10 ⁻¹	5.18	3.34x10 ⁻¹	1.19x10 ¹	4.16x10 ⁻¹	4.83x10 ⁻¹	2.79x10 ⁻²	1.65x10 ⁻²	3.75x10 ⁻²	2.02x10 ⁻²	2.50x10 ⁻²	1.08x10 ⁻²	5.01x10 ⁻²	2.64x10 ⁻²	3.58x10 ⁻³
Copper	4.43x10 ⁻¹	5.85x10 ¹	7.47x10 ⁻¹	3.57x10 ¹	1.55	2.32	3.27x10 ⁻¹	3.32x10 ⁻¹	3.83x10 ⁻¹	5.01x10 ⁻¹	4.13x10 ⁻¹	1.68x10 ⁻¹	1.25	2.00	6.80x10 ⁻²
Lead	3.18x10 ⁻¹	6.73x10 ⁻¹	5.25x10 ⁻¹	1.53	5.05x10 ⁻¹	5.02x10 ⁻¹	2.73x10 ⁻²	7.04x10 ⁻¹	4.59x10 ⁻¹	5.55	1.81	2.33x10 ⁻²	2.61x10 ⁻¹	2.21	1.70x10 ⁻¹
Manganese	9.09	8.27x10 ¹	4.31	7.88x10 ²	2.83	5.09	3.82x10 ¹	3.67x10 ¹	3.98x10 ¹	2.65x10 ¹	7.23x10 ¹	8.94	2.80x10 ¹	1.10x10 ¹	2.38x10 ⁻¹
Nickel	9.83x10 ⁻²	6.62x10 ⁻¹	4.28x10 ⁻¹	4.80	7.21x10 ⁻²	8.49x10 ⁻²	6.19x10 ⁻²	1.93x10 ⁻¹	1.43x10 ⁻¹	1.20x10 ⁻¹	4.79x10 ⁻¹	2.48x10 ⁻²	1.16x10 ⁻¹	4.90x10 ⁻²	7.73x10 ⁻³
Silver	4.47x10 ⁻³	2.10x10 ⁻²	3.53x10 ⁻²	3.24x10 ⁻²	4.47x10 ⁻³	3.12x10 ⁻⁴	2.93x10 ⁻³	4.83x10 ⁻³	4.43x10 ⁻³	7.14x10 ⁻³	1.25x10 ⁻²	2.40x10 ⁻³	5.56x10 ⁻³	5.32x10 ⁻³	4.16x10 ⁻⁴
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	6.58x10 ⁻⁴	7.94x10 ⁻⁴	7.72x10 ⁻⁴	7.71x10 ⁻³	5.20x10 ⁻⁴	2.24x10 ⁻⁴	3.75x10 ⁻⁴	1.21x10 ⁻³	9.75x10 ⁻⁵
Tin	n/a	n/a	n/a	n/a	n/a	n/a	2.37x10 ⁻²	1.82x10 ⁻²	2.11x10 ⁻²	9.76x10 ⁻³	2.12x10 ⁻²	7.93x10 ⁻³	9.17x10 ⁻³	7.81x10 ⁻³	2.19x10 ⁻³
Zinc	1.88x10 ¹	1.74x10 ³	8.16	4.80x10 ³	3.49	3.09x10 ¹	3.36	2.95x10 ¹	5.07	1.24x10 ¹	6.98	7.14	1.84x10 ²	7.16x10 ¹	1.72x10 ¹

mg/(kg d)	Mink						Beaver						Fox		
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Arsenic	6.91x10 ⁻²	1.21	3.54x10 ⁻¹	6.55x10 ⁻¹	3.70x10 ⁻²	4.57x10 ⁻²	7.94x10 ⁻³	8.67x10 ⁻²	2.56x10 ⁻²	4.45x10 ⁻²	5.95x10 ⁻³	6.80x10 ⁻³	3.78x10 ⁻³	4.62x10 ⁻²	8.43x10 ⁻²
Cadmium	9.76x10 ⁻²	2.35	1.35x10 ⁻¹	4.89	1.72x10 ⁻¹	2.02x10 ⁻¹	1.57x10 ⁻¹	2.51	2.01x10 ⁻¹	5.79	2.41x10 ⁻¹	3.16x10 ⁻¹	2.32x10 ⁻²	4.98x10 ⁻¹	8.13x10 ⁻¹
Copper	3.28x10 ⁻¹	4.32x10 ¹	5.53x10 ⁻¹	2.64x10 ¹	1.15	1.72	7.06x10 ⁻²	4.54	9.39x10 ⁻²	2.80	1.56x10 ⁻¹	2.37x10 ⁻¹	2.93x10 ⁻²	3.49x10 ⁻¹	5.76x10 ⁻¹
Lead	2.14x10 ⁻¹	4.75x10 ⁻¹	3.53x10 ⁻¹	1.03	3.39x10 ⁻¹	3.40x10 ⁻¹	4.44x10 ⁻²	2.31x10 ⁻¹	7.18x10 ⁻²	2.20x10 ⁻¹	6.91x10 ⁻²	8.39x10 ⁻²	8.99x10 ⁻³	9.81x10 ⁻²	8.76x10 ⁻¹
Manganese	4.02	3.66x10 ¹	1.91	3.49x10 ²	1.25	2.25	6.79	2.91x10 ¹	6.53	4.91x10 ¹	6.45	6.08	8.63x10 ⁻¹	1.87	7.24x10 ⁻¹
Nickel	6.50x10 ⁻²	4.38x10 ⁻¹	2.83x10 ⁻¹	3.17	4.77x10 ⁻²	5.61x10 ⁻²	3.44x10 ⁻²	9.84x10 ⁻²	6.85x10 ⁻²	5.30x10 ⁻¹	3.17x10 ⁻²	4.18x10 ⁻²	8.14x10 ⁻³	2.23x10 ⁻¹	3.80x10 ⁻²
Silver	6.76x10 ⁻³	3.18x10 ⁻²	5.33x10 ⁻²	4.90x10 ⁻²	6.76x10 ⁻³	4.72x10 ⁻⁴	2.22x10 ⁻³	1.05x10 ⁻²	1.69x10 ⁻²	1.61x10 ⁻²	2.22x10 ⁻³	8.32x10 ⁻⁴	9.98x10 ⁻⁴	2.81x10 ⁻³	2.51x10 ⁻³
Thallium	4.05x10 ⁻⁷	2.02x10 ⁻⁶	4.05x10 ⁻⁷	5.19x10 ⁻⁷	4.05x10 ⁻⁷	5.19x10 ⁻⁷	9.02x10 ⁻⁵	9.29x10 ⁻⁵	9.02x10 ⁻⁵	1.19x10 ⁻⁴	9.02x10 ⁻⁵	1.19x10 ⁻⁴	2.00x10 ⁻⁵	3.46x10 ⁻⁵	2.51x10 ⁻⁵
Tin	1.44x10 ⁻⁵	1.05x10 ⁻⁵	1.44x10 ⁻⁵	2.48x10 ⁻⁵	1.44x10 ⁻⁵	2.48x10 ⁻⁵	1.90x10 ⁻³	4.79x10 ⁻³	1.90x10 ⁻³	2.05x10 ⁻³	1.90x10 ⁻³	2.05x10 ⁻³	1.64x10 ⁻³	3.13x10 ⁻³	2.50x10 ⁻³
Zinc	1.17x10 ¹	1.08x10 ³	5.12	3.00x10 ³	2.20	1.93x10 ¹	3.36	1.31x10 ²	2.59	3.53x10 ²	2.24	5.09	6.55x10 ⁻¹	6.58x10 ²	2.38x10 ²

TABLE 4.4-3
PREDICTED INTAKES FOR TERRESTRIAL ANIMALS “NO INTERVENTION” SCENARIO – FUTURE 3

mg/(kg d)	Caribou Overall	Hare					Moose Overall	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Arsenic	3.99x10 ⁻²	3.42x10 ⁻²	9.89x10 ⁻²	7.35x10 ⁻²	2.37x10 ⁻¹	1.52x10 ⁻¹	1.32x10 ⁻¹	1.12x10 ⁻²	4.60x10 ⁻²	9.96x10 ⁻²	8.05x10 ⁻²	2.67x10 ⁻¹	1.52x10 ⁻¹
Cadmium	1.24x10 ⁻²	2.84x10 ⁻¹	2.22x10 ⁻¹	7.52x10 ⁻²	2.59x10 ⁻¹	3.19x10 ⁻¹	2.06	7.22x10 ⁻³	4.35x10 ⁻¹	3.40x10 ⁻¹	8.18x10 ⁻²	3.95x10 ⁻¹	4.91x10 ⁻¹
Copper	1.62x10 ⁻¹	4.30x10 ⁻¹	7.35x10 ⁻¹	7.14x10 ⁻¹	1.08	8.73x10 ⁻¹	8.49	2.78x10 ⁻¹	4.53x10 ⁻¹	8.16x10 ⁻¹	7.37x10 ⁻¹	1.11	9.19x10 ⁻¹
Lead	2.11	6.39x10 ⁻²	1.26	1.66	1.04x10 ¹	3.86	2.46x10 ⁻¹	4.23x10 ⁻²	6.70x10 ⁻²	1.16	2.03	9.79	3.58
Manganese	3.45	6.08x10 ¹	6.32x10 ¹	3.24x10 ¹	2.48x10 ¹	8.74x10 ¹	3.78x10 ¹	1.97x10 ¹	6.90x10 ¹	7.10x10 ¹	2.44x10 ¹	1.97x10 ¹	8.67x10 ¹
Nickel	2.93x10 ⁻²	2.03x10 ⁻¹	3.67x10 ⁻¹	1.24x10 ⁻¹	3.09x10 ⁻¹	5.75x10 ⁻¹	2.80x10 ⁻¹	1.05x10 ⁻¹	2.76x10 ⁻¹	4.08x10 ⁻¹	8.40x10 ⁻²	3.89x10 ⁻¹	5.78x10 ⁻¹
Silver	5.11x10 ⁻³	5.62x10 ⁻³	1.10x10 ⁻²	6.05x10 ⁻³	1.54x10 ⁻²	1.16x10 ⁻²	3.54x10 ⁻³	2.17x10 ⁻³	5.44x10 ⁻³	1.29x10 ⁻²	5.32x10 ⁻³	1.59x10 ⁻²	8.04x10 ⁻³
Thallium	1.60x10 ⁻³	8.77x10 ⁻⁴	1.12x10 ⁻³	1.11x10 ⁻³	4.37x10 ⁻³	9.96x10 ⁻⁴	1.42x10 ⁻⁴	1.84x10 ⁻³	9.92x10 ⁻⁴	1.28x10 ⁻³	1.27x10 ⁻³	1.30x10 ⁻³	1.29x10 ⁻³
Tin	2.23x10 ⁻²	3.11x10 ⁻²	5.37x10 ⁻²	3.34x10 ⁻²	2.28x10 ⁻²	2.61x10 ⁻²	1.81x10 ⁻³	1.86x10 ⁻²	2.94x10 ⁻²	6.24x10 ⁻²	6.32x10 ⁻²	2.79x10 ⁻²	2.11x10 ⁻²
Zinc	4.03	1.46x10 ¹	3.02x10 ¹	1.84x10 ¹	4.79x10 ¹	3.71x10 ¹	1.53x10 ²	4.19	2.10x10 ¹	2.11x10 ¹	2.11x10 ¹	6.20x10 ¹	4.94x10 ¹

mg/(kg d)	Mallard						Merganser					
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Arsenic	1.65x10 ⁻¹	4.73x10 ¹	8.44x10 ⁻¹	1.56	8.82x10 ⁻²	4.17x10 ⁻¹	1.34x10 ⁻²	3.85	6.86x10 ⁻²	1.27x10 ⁻¹	7.17x10 ⁻³	3.39x10 ⁻²
Cadmium	2.61x10 ⁻¹	7.80x10 ¹	3.59x10 ⁻¹	8.16x10 ¹	4.48x10 ⁻¹	1.14	8.41x10 ⁻³	2.52	1.16x10 ⁻²	2.63	1.44x10 ⁻²	3.68x10 ⁻²
Copper	1.84x10 ⁻¹	2.96x10 ²	3.10x10 ⁻¹	2.41x10 ²	6.44x10 ⁻¹	3.73	1.58x10 ⁻¹	2.54x10 ²	2.67x10 ⁻¹	2.07x10 ²	5.53x10 ⁻¹	3.21
Lead	9.83x10 ⁻²	1.07	1.62x10 ⁻¹	1.28	1.56x10 ⁻¹	1.63x10 ⁻¹	6.41x10 ⁻²	6.96x10 ⁻¹	1.06x10 ⁻¹	8.34x10 ⁻¹	1.02x10 ⁻¹	1.06x10 ⁻¹
Manganese	4.71	9.26x10 ²	2.23	2.93x10 ³	1.47	1.29x10 ¹	1.52	2.99x10 ²	7.20x10 ⁻¹	9.45x10 ²	4.73x10 ⁻¹	4.17
Nickel	3.05x10 ⁻²	2.01	1.33x10 ⁻¹	5.56	2.24x10 ⁻²	4.59x10 ⁻²	2.01x10 ⁻²	1.32	8.73x10 ⁻²	3.65	1.47x10 ⁻²	3.02x10 ⁻²
Silver	4.68x10 ⁻³	1.41x10 ⁻¹	3.69x10 ⁻²	3.39x10 ⁻²	4.68x10 ⁻³	1.42x10 ⁻³	4.38x10 ⁻³	1.32x10 ⁻¹	3.46x10 ⁻²	3.18x10 ⁻²	4.38x10 ⁻³	1.33x10 ⁻³
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	1.23x10 ¹	1.74x10 ⁴	5.36	2.07x10 ⁴	2.29	1.64x10 ²	6.25	8.83x10 ³	2.72	1.05x10 ⁴	1.16	8.32x10 ¹

TABLE 4.4-3 (Cont'd)
PREDICTED INTAKES FOR TERRESTRIAL ANIMALS “NO INTERVENTION” SCENARIO – FUTURE 3

mg/(kg d)	Scaup						Hoary Marmot					Bear			Wolf
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall
Arsenic	2.87x10 ⁻¹	8.24x10 ¹	1.47	2.72	1.54x10 ⁻¹	7.26x10 ⁻¹	1.08x10 ⁻²	6.06x10 ⁻²	3.84x10 ⁻²	1.16x10 ⁻¹	8.08x10 ⁻²	6.74x10 ⁻³	3.03x10 ⁻²	3.17x10 ⁻¹	5.39x10 ⁻³
Cadmium	2.42x10 ⁻¹	7.25x10 ¹	3.34x10 ⁻¹	7.58x10 ¹	4.16x10 ⁻¹	1.06	2.79x10 ⁻²	2.30x10 ⁻²	4.44x10 ⁻²	2.71x10 ⁻²	3.18x10 ⁻²	2.21x10 ⁻²	2.96x10 ⁻¹	2.85x10 ⁻¹	3.51x10 ⁻²
Copper	4.43x10 ⁻¹	7.13x10 ²	7.47x10 ⁻¹	5.80x10 ²	1.55	8.99	3.27x10 ⁻¹	4.80x10 ⁻¹	5.61x10 ⁻¹	6.79x10 ⁻¹	5.91x10 ⁻¹	3.84x10 ⁻¹	1.82x10 ¹	2.23x10 ¹	6.77x10 ⁻¹
Lead	3.18x10 ⁻¹	3.45	5.25x10 ⁻¹	4.14	5.05x10 ⁻¹	5.27x10 ⁻¹	2.73x10 ⁻²	7.06x10 ⁻¹	4.61x10 ⁻¹	5.55	1.81	2.34x10 ⁻²	2.83x10 ⁻¹	2.24	1.70x10 ⁻¹
Manganese	9.09	1.79x10 ³	4.31	5.66x10 ³	2.83	2.49x10 ¹	3.82x10 ¹	3.87x10 ¹	4.05x10 ¹	2.72x10 ¹	7.30x10 ¹	8.97	9.51x10 ¹	3.46x10 ¹	4.30x10 ⁻¹
Nickel	9.83x10 ⁻²	6.46	4.28x10 ⁻¹	1.79x10 ¹	7.21x10 ⁻²	1.48x10 ⁻¹	6.19x10 ⁻²	2.08x10 ⁻¹	1.50x10 ⁻¹	1.27x10 ⁻¹	4.86x10 ⁻¹	2.78x10 ⁻²	2.51x10 ⁻¹	1.10x10 ⁻¹	1.66x10 ⁻²
Silver	4.47x10 ⁻³	1.35x10 ⁻¹	3.53x10 ⁻²	3.24x10 ⁻²	4.47x10 ⁻³	1.35x10 ⁻³	2.93x10 ⁻³	4.83x10 ⁻³	4.64x10 ⁻³	7.35x10 ⁻³	1.28x10 ⁻²	2.41x10 ⁻³	5.57x10 ⁻³	1.77x10 ⁻²	4.59x10 ⁻⁴
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	6.58x10 ⁻⁴	7.94x10 ⁻⁴	7.72x10 ⁻⁴	7.71x10 ⁻³	5.20x10 ⁻⁴	2.24x10 ⁻⁴	3.75x10 ⁻⁴	1.21x10 ⁻³	9.75x10 ⁻⁵
Tin	n/a	n/a	n/a	n/a	n/a	n/a	2.37x10 ⁻²	1.82x10 ⁻²	2.11x10 ⁻²	9.76x10 ⁻³	2.12x10 ⁻²	7.93x10 ⁻³	9.17x10 ⁻³	7.81x10 ⁻³	2.19x10 ⁻³
Zinc	1.88x10 ¹	2.65x10 ⁴	8.16	3.15x10 ⁴	3.49	2.50x10 ²	3.36	3.49x10 ¹	1.01x10 ¹	1.75x10 ¹	1.20x10 ¹	4.38x10 ¹	1.18x10 ³	1.00x10 ³	1.18x10 ²

mg/(kg d)	Mink						Beaver						Fox		
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Arsenic	6.91x10 ⁻²	1.99x10 ¹	3.54x10 ⁻¹	6.55x10 ⁻¹	3.70x10 ⁻²	1.75x10 ⁻¹	7.94x10 ⁻³	1.24	2.56x10 ⁻²	4.45x10 ⁻²	5.95x10 ⁻³	1.48x10 ⁻²	3.78x10 ⁻³	4.62x10 ⁻²	1.24
Cadmium	9.76x10 ⁻²	3.23x10 ¹	1.35x10 ⁻¹	3.29x10 ¹	1.72x10 ⁻¹	4.64x10 ⁻¹	1.57x10 ⁻¹	3.47x10 ¹	2.01x10 ⁻¹	3.63x10 ¹	2.41x10 ⁻¹	5.92x10 ⁻¹	2.32x10 ⁻²	8.06	9.90
Copper	3.28x10 ⁻¹	5.27x10 ²	5.53x10 ⁻¹	4.29x10 ²	1.15	6.65	7.06x10 ⁻²	5.49x10 ¹	9.39x10 ⁻²	4.47x10 ¹	1.56x10 ⁻¹	7.50x10 ⁻¹	2.93x10 ⁻²	5.22	6.43
Lead	2.14x10 ⁻¹	2.34	3.53x10 ⁻¹	2.79	3.39x10 ⁻¹	3.57x10 ⁻¹	4.44x10 ⁻²	6.00x10 ⁻¹	7.18x10 ⁻²	5.66x10 ⁻¹	6.91x10 ⁻²	8.72x10 ⁻²	8.99x10 ⁻³	1.07x10 ⁻¹	8.86x10 ⁻¹
Manganese	4.02	7.91x10 ²	1.91	2.50x10 ³	1.25	1.10x10 ¹	6.79	1.23x10 ²	6.53	3.17x10 ²	6.45	7.17	8.63x10 ⁻¹	7.75	2.78
Nickel	6.50x10 ⁻²	4.27	2.83x10 ⁻¹	1.18x10 ¹	4.77x10 ⁻²	9.77x10 ⁻²	3.44x10 ⁻²	6.98x10 ⁻¹	6.85x10 ⁻²	1.89	3.17x10 ⁻²	4.83x10 ⁻²	8.14x10 ⁻³	7.93x10 ⁻¹	2.90x10 ⁻¹
Silver	6.76x10 ⁻³	2.03x10 ⁻¹	5.33x10 ⁻²	4.90x10 ⁻²	6.76x10 ⁻³	2.04x10 ⁻³	2.22x10 ⁻³	6.45x10 ⁻²	1.69x10 ⁻²	1.61x10 ⁻²	2.22x10 ⁻³	1.33x10 ⁻³	9.98x10 ⁻⁴	2.81x10 ⁻³	1.02x10 ⁻²
Thallium	4.05x10 ⁻⁷	2.02x10 ⁻⁶	4.05x10 ⁻⁷	5.19x10 ⁻⁷	4.05x10 ⁻⁷	5.19x10 ⁻⁷	9.02x10 ⁻⁵	9.29x10 ⁻⁵	9.02x10 ⁻⁵	1.19x10 ⁻⁴	9.02x10 ⁻⁵	1.19x10 ⁻⁴	2.00x10 ⁻⁵	3.46x10 ⁻⁵	2.51x10 ⁻⁵
Tin	1.44x10 ⁻⁵	1.05x10 ⁻⁵	1.44x10 ⁻⁵	2.48x10 ⁻⁵	1.44x10 ⁻⁵	2.48x10 ⁻⁵	1.90x10 ⁻³	4.79x10 ⁻³	1.90x10 ⁻³	2.05x10 ⁻³	1.90x10 ⁻³	2.05x10 ⁻³	1.64x10 ⁻³	3.13x10 ⁻³	2.50x10 ⁻³
Zinc	1.17x10 ¹	1.66x10 ⁴	5.12	1.97x10 ⁴	2.20	1.56x10 ²	3.36	1.94x10 ³	2.59	2.30x10 ³	2.24	2.11x10 ¹	6.55x10 ⁻¹	4.32x10 ³	3.63x10 ³

TABLE 4.4-4
PREDICTED INTAKES FOR TERRESTRIAL ANIMALS “REMEDIATION” SCENARIO – FUTURE 2

mg/(kg d)	Caribou Overall	Hare					Moose Overall	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Arsenic	3.76x10 ⁻²	3.42x10 ⁻²	9.83x10 ⁻²	4.49x10 ⁻²	2.09x10 ⁻¹	1.23x10 ⁻¹	1.82x10 ⁻²	1.10x10 ⁻²	4.60x10 ⁻²	9.92x10 ⁻²	5.73x10 ⁻²	2.44x10 ⁻¹	1.29x10 ⁻¹
Cadmium	1.11x10 ⁻²	2.84x10 ⁻¹	2.13x10 ⁻¹	6.72x10 ⁻²	2.51x10 ⁻¹	3.11x10 ⁻¹	1.01x10 ⁻¹	4.34x10 ⁻³	4.35x10 ⁻¹	3.34x10 ⁻¹	7.53x10 ⁻²	3.88x10 ⁻¹	4.84x10 ⁻¹
Copper	1.31x10 ⁻¹	4.30x10 ⁻¹	5.62x10 ⁻¹	5.02x10 ⁻¹	8.66x10 ⁻¹	6.61x10 ⁻¹	1.20x10 ⁻¹	2.18x10 ⁻¹	4.53x10 ⁻¹	6.75x10 ⁻¹	5.64x10 ⁻¹	9.33x10 ⁻¹	7.46x10 ⁻¹
Lead	2.11	6.39x10 ⁻²	1.26	1.66	1.04x10 ¹	3.86	1.83x10 ⁻¹	4.15x10 ⁻²	6.70x10 ⁻²	1.16	2.02	9.79	3.58
Manganese	3.17	6.08x10 ¹	6.06x10 ¹	3.16x10 ¹	2.40x10 ¹	8.65x10 ¹	8.40	1.88x10 ¹	6.90x10 ¹	6.89x10 ¹	2.37x10 ¹	1.90x10 ¹	8.60x10 ¹
Nickel	2.69x10 ⁻²	2.03x10 ⁻¹	3.45x10 ⁻¹	1.16x10 ⁻¹	3.01x10 ⁻¹	5.67x10 ⁻¹	6.29x10 ⁻²	9.72x10 ⁻²	2.76x10 ⁻¹	3.90x10 ⁻¹	7.76x10 ⁻²	3.83x10 ⁻¹	5.71x10 ⁻¹
Silver	5.08x10 ⁻³	5.62x10 ⁻³	1.09x10 ⁻²	5.78x10 ⁻³	1.51x10 ⁻²	1.13x10 ⁻²	1.52x10 ⁻³	2.16x10 ⁻³	5.44x10 ⁻³	1.29x10 ⁻²	5.10x10 ⁻³	1.57x10 ⁻²	7.82x10 ⁻³
Thallium	1.60x10 ⁻³	8.77x10 ⁻⁴	1.12x10 ⁻³	1.11x10 ⁻³	4.37x10 ⁻³	9.96x10 ⁻⁴	1.42x10 ⁻⁴	1.84x10 ⁻³	9.92x10 ⁻⁴	1.28x10 ⁻³	1.27x10 ⁻³	1.30x10 ⁻³	1.29x10 ⁻³
Tin	2.23x10 ⁻²	3.11x10 ⁻²	5.37x10 ⁻²	3.34x10 ⁻²	2.28x10 ⁻²	2.61x10 ⁻²	1.81x10 ⁻³	1.86x10 ⁻²	2.94x10 ⁻²	6.24x10 ⁻²	6.32x10 ⁻²	2.79x10 ⁻²	2.11x10 ⁻²
Zinc	2.97	1.46x10 ¹	2.32x10 ¹	1.25x10 ¹	4.20x10 ¹	3.12x10 ¹	5.09	1.76	2.10x10 ¹	1.54x10 ¹	1.63x10 ¹	5.72x10 ¹	4.46x10 ¹

mg/(kg d)	Mallard						Merganser					
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Arsenic	1.65x10 ⁻¹	2.38x10 ⁻¹	8.44x10 ⁻¹	6.12x10 ⁻¹	8.82x10 ⁻²	9.14x10 ⁻²	1.34x10 ⁻²	1.94x10 ⁻²	6.86x10 ⁻²	4.98x10 ⁻²	7.17x10 ⁻³	7.44x10 ⁻³
Cadmium	2.61x10 ⁻¹	6.95x10 ⁻¹	3.59x10 ⁻¹	1.34	4.48x10 ⁻¹	4.49x10 ⁻¹	8.41x10 ⁻³	2.24x10 ⁻²	1.16x10 ⁻²	4.33x10 ⁻²	1.44x10 ⁻²	1.45x10 ⁻²
Copper	1.84x10 ⁻¹	1.02	3.10x10 ⁻¹	3.51x10 ⁻¹	6.44x10 ⁻¹	6.48x10 ⁻¹	1.58x10 ⁻¹	8.79x10 ⁻¹	2.67x10 ⁻¹	3.02x10 ⁻¹	5.53x10 ⁻¹	5.57x10 ⁻¹
Lead	9.83x10 ⁻²	1.56x10 ⁻¹	1.62x10 ⁻¹	3.31x10 ⁻¹	1.56x10 ⁻¹	1.55x10 ⁻¹	6.41x10 ⁻²	1.02x10 ⁻¹	1.06x10 ⁻¹	2.16x10 ⁻¹	1.02x10 ⁻¹	1.01x10 ⁻¹
Manganese	4.71	3.93	2.23	2.50	1.47	1.51	1.52	1.27	7.20x10 ⁻¹	8.07x10 ⁻¹	4.73x10 ⁻¹	4.88x10 ⁻¹
Nickel	3.05x10 ⁻²	8.70x10 ⁻²	1.33x10 ⁻¹	2.29x10 ⁻¹	2.24x10 ⁻²	2.35x10 ⁻²	2.01x10 ⁻²	5.71x10 ⁻²	8.73x10 ⁻²	1.50x10 ⁻¹	1.47x10 ⁻²	1.55x10 ⁻²
Silver	4.68x10 ⁻³	5.01x10 ⁻³	3.69x10 ⁻²	1.83x10 ⁻²	4.68x10 ⁻³	1.38x10 ⁻⁴	4.38x10 ⁻³	4.69x10 ⁻³	3.46x10 ⁻²	1.71x10 ⁻²	4.38x10 ⁻³	1.29x10 ⁻⁴
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	1.23x10 ¹	3.63x10 ¹	5.36	1.00x10 ¹	2.29	2.73	6.25	1.84x10 ¹	2.72	5.07	1.16	1.38

TABLE 4.4-4 (Cont'd)
PREDICTED INTAKES FOR TERRESTRIAL ANIMALS “REMEDIATION” SCENARIO – FUTURE 2

mg/(kg d)	Scaup						Hoary Marmot					Bear			Wolf Overall
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	
Arsenic	2.87x10 ⁻¹	4.15x10 ⁻¹	1.47	1.07	1.54x10 ⁻¹	1.59x10 ⁻¹	1.08x10 ⁻²	6.01x10 ⁻²	1.24x10 ⁻²	9.05x10 ⁻²	5.48x10 ⁻²	6.11x10 ⁻³	2.39x10 ⁻²	3.25x10 ⁻²	2.74x10 ⁻³
Cadmium	2.42x10 ⁻¹	6.46x10 ⁻¹	3.34x10 ⁻¹	1.25	4.16x10 ⁻¹	4.17x10 ⁻¹	2.79x10 ⁻²	1.54x10 ⁻²	3.71x10 ⁻²	1.98x10 ⁻²	2.46x10 ⁻²	9.97x10 ⁻³	9.98x10 ⁻³	8.94x10 ⁻³	1.16x10 ⁻³
Copper	4.43x10 ⁻¹	2.46	7.47x10 ⁻¹	8.45x10 ⁻¹	1.55	1.56	3.27x10 ⁻¹	3.23x10 ⁻¹	3.68x10 ⁻¹	4.86x10 ⁻¹	3.98x10 ⁻¹	1.51x10 ⁻¹	1.68x10 ⁻¹	2.67x10 ⁻¹	2.17x10 ⁻²
Lead	3.18x10 ⁻¹	5.06x10 ⁻¹	5.25x10 ⁻¹	1.07	5.05x10 ⁻¹	5.02x10 ⁻¹	2.73x10 ⁻²	7.04x10 ⁻¹	4.59x10 ⁻¹	5.55	1.81	2.33x10 ⁻²	2.57x10 ⁻¹	2.21	1.70x10 ⁻¹
Manganese	9.09	7.58	4.31	4.83	2.83	2.92	3.82x10 ¹	3.64x10 ¹	3.97x10 ¹	2.64x10 ¹	7.22x10 ¹	8.93	1.72x10 ¹	1.00x10 ¹	2.13x10 ⁻¹
Nickel	9.83x10 ⁻²	2.80x10 ⁻¹	4.28x10 ⁻¹	7.37x10 ⁻¹	7.21x10 ⁻²	7.58x10 ⁻²	6.19x10 ⁻²	1.88x10 ⁻¹	1.43x10 ⁻¹	1.20x10 ⁻¹	4.79x10 ⁻¹	2.41x10 ⁻²	7.44x10 ⁻²	4.44x10 ⁻²	5.65x10 ⁻³
Silver	4.47x10 ⁻³	4.78x10 ⁻³	3.53x10 ⁻²	1.75x10 ⁻²	4.47x10 ⁻³	1.32x10 ⁻⁴	2.93x10 ⁻³	4.81x10 ⁻³	4.40x10 ⁻³	7.11x10 ⁻³	1.25x10 ⁻²	2.40x10 ⁻³	3.92x10 ⁻³	3.54x10 ⁻³	4.04x10 ⁻⁴
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	6.58x10 ⁻⁴	7.94x10 ⁻⁴	7.72x10 ⁻⁴	7.71x10 ⁻³	5.20x10 ⁻⁴	2.24x10 ⁻⁴	3.75x10 ⁻⁴	1.21x10 ⁻³	9.75x10 ⁻⁵
Tin	n/a	n/a	n/a	n/a	n/a	n/a	2.37x10 ⁻²	1.82x10 ⁻²	2.11x10 ⁻²	9.76x10 ⁻³	2.12x10 ⁻²	7.93x10 ⁻³	9.17x10 ⁻³	7.81x10 ⁻³	2.19x10 ⁻³
Zinc	1.88x10 ¹	5.52x10 ¹	8.16	1.52x10 ¹	3.49	4.16	3.36	2.86x10 ¹	4.73	1.21x10 ¹	6.64	2.54	6.99	6.44	4.46

mg/(kg d)	Mink						Beaver						Fox		
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Arsenic	6.91x10 ⁻²	9.99x10 ⁻²	3.54x10 ⁻¹	2.57x10 ⁻¹	3.70x10 ⁻²	3.84x10 ⁻²	7.94x10 ⁻³	1.78x10 ⁻²	2.56x10 ⁻²	1.98x10 ⁻²	5.95x10 ⁻³	6.34x10 ⁻³	3.78x10 ⁻³	2.15x10 ⁻²	1.54x10 ⁻²
Cadmium	9.76x10 ⁻²	2.67x10 ⁻¹	1.35x10 ⁻¹	4.95x10 ⁻¹	1.72x10 ⁻¹	1.72x10 ⁻¹	1.57x10 ⁻¹	3.44x10 ⁻¹	2.01x10 ⁻¹	6.81x10 ⁻¹	2.41x10 ⁻¹	2.85x10 ⁻¹	2.32x10 ⁻²	1.31x10 ⁻²	3.58x10 ⁻²
Copper	3.28x10 ⁻¹	1.82	5.53x10 ⁻¹	6.25x10 ⁻¹	1.15	1.15	7.06x10 ⁻²	2.36x10 ⁻¹	9.39x10 ⁻²	1.24x10 ⁻¹	1.56x10 ⁻¹	1.79x10 ⁻¹	2.93x10 ⁻²	3.69x10 ⁻²	7.46x10 ⁻²
Lead	2.14x10 ⁻¹	3.63x10 ⁻¹	3.53x10 ⁻¹	7.23x10 ⁻¹	3.39x10 ⁻¹	3.40x10 ⁻¹	4.44x10 ⁻²	2.09x10 ⁻¹	7.18x10 ⁻²	1.59x10 ⁻¹	6.91x10 ⁻²	8.39x10 ⁻²	8.99x10 ⁻³	9.65x10 ⁻²	8.76x10 ⁻¹
Manganese	4.02	3.35	1.91	2.14	1.25	1.29	6.79	2.49x10 ¹	6.53	6.07	6.45	5.96	8.63x10 ⁻¹	9.25x10 ⁻¹	6.33x10 ⁻¹
Nickel	6.50x10 ⁻²	1.85x10 ⁻¹	2.83x10 ⁻¹	4.87x10 ⁻¹	4.77x10 ⁻²	5.01x10 ⁻²	3.44x10 ⁻²	5.89x10 ⁻²	6.85x10 ⁻²	1.09x10 ⁻¹	3.17x10 ⁻²	4.09x10 ⁻²	8.14x10 ⁻³	4.70x10 ⁻²	2.14x10 ⁻²
Silver	6.76x10 ⁻³	7.23x10 ⁻³	5.33x10 ⁻²	2.64x10 ⁻²	6.76x10 ⁻³	2.00x10 ⁻⁴	2.22x10 ⁻³	2.77x10 ⁻³	1.69x10 ⁻²	8.99x10 ⁻³	2.22x10 ⁻³	7.46x10 ⁻⁴	9.98x10 ⁻⁴	1.79x10 ⁻³	1.41x10 ⁻³
Thallium	4.05x10 ⁻⁷	2.02x10 ⁻⁶	4.05x10 ⁻⁷	5.19x10 ⁻⁷	4.05x10 ⁻⁷	5.19x10 ⁻⁷	9.02x10 ⁻⁵	9.29x10 ⁻⁵	9.02x10 ⁻⁵	1.19x10 ⁻⁴	9.02x10 ⁻⁵	1.19x10 ⁻⁴	2.00x10 ⁻⁵	3.46x10 ⁻⁵	2.51x10 ⁻⁵
Tin	1.44x10 ⁻⁵	1.05x10 ⁻⁵	1.44x10 ⁻⁵	2.48x10 ⁻⁵	1.44x10 ⁻⁵	2.48x10 ⁻⁵	1.90x10 ⁻³	4.79x10 ⁻³	1.90x10 ⁻³	2.05x10 ⁻³	1.90x10 ⁻³	2.05x10 ⁻³	1.64x10 ⁻³	3.13x10 ⁻³	2.50x10 ⁻³
Zinc	1.17x10 ¹	3.45x10 ¹	5.12	9.55	2.20	2.63	3.36	7.87	2.59	3.94	2.24	3.14	6.55x10 ⁻¹	2.42	8.34

TABLE 4.4-5
PREDICTED INTAKES FOR TERRESTRIAL ANIMALS “REMEDIATION” SCENARIO – FUTURE 3

mg/(kg d)	Caribou Overall	Hare					Moose Overall	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Arsenic	3.76x10 ⁻²	3.42x10 ⁻²	9.83x10 ⁻²	4.55x10 ⁻²	2.09x10 ⁻¹	1.24x10 ⁻¹	2.05x10 ⁻²	1.10x10 ⁻²	4.60x10 ⁻²	9.92x10 ⁻²	5.78x10 ⁻²	2.44x10 ⁻¹	1.29x10 ⁻¹
Cadmium	1.11x10 ⁻²	2.84x10 ⁻¹	2.13x10 ⁻¹	6.74x10 ⁻²	2.51x10 ⁻¹	3.11x10 ⁻¹	1.27x10 ⁻¹	4.35x10 ⁻³	4.35x10 ⁻¹	3.34x10 ⁻¹	7.55x10 ⁻²	3.88x10 ⁻¹	4.85x10 ⁻¹
Copper	1.31x10 ⁻¹	4.30x10 ⁻¹	5.63x10 ⁻¹	5.06x10 ⁻¹	8.70x10 ⁻¹	6.65x10 ⁻¹	2.20x10 ⁻¹	2.18x10 ⁻¹	4.53x10 ⁻¹	6.76x10 ⁻¹	5.68x10 ⁻¹	9.36x10 ⁻¹	7.50x10 ⁻¹
Lead	2.11	6.39x10 ⁻²	1.26	1.66	1.04x10 ¹	3.86	1.83x10 ⁻¹	4.15x10 ⁻²	6.70x10 ⁻²	1.16	2.02	9.79	3.58
Manganese	3.17	6.08x10 ¹	6.06x10 ¹	3.16x10 ¹	2.40x10 ¹	8.66x10 ¹	8.65	1.88x10 ¹	6.90x10 ¹	6.89x10 ¹	2.38x10 ¹	1.90x10 ¹	8.60x10 ¹
Nickel	2.69x10 ⁻²	2.03x10 ⁻¹	3.45x10 ⁻¹	1.16x10 ⁻¹	3.01x10 ⁻¹	5.67x10 ⁻¹	6.49x10 ⁻²	9.73x10 ⁻²	2.76x10 ⁻¹	3.91x10 ⁻¹	7.77x10 ⁻²	3.83x10 ⁻¹	5.72x10 ⁻¹
Silver	5.08x10 ⁻³	5.62x10 ⁻³	1.09x10 ⁻²	5.79x10 ⁻³	1.51x10 ⁻²	1.13x10 ⁻²	1.55x10 ⁻³	2.16x10 ⁻³	5.44x10 ⁻³	1.29x10 ⁻²	5.10x10 ⁻³	1.57x10 ⁻²	7.82x10 ⁻³
Thallium	1.60x10 ⁻³	8.77x10 ⁻⁴	1.12x10 ⁻³	1.11x10 ⁻³	4.37x10 ⁻³	9.96x10 ⁻⁴	1.42x10 ⁻⁴	1.84x10 ⁻³	9.92x10 ⁻⁴	1.28x10 ⁻³	1.27x10 ⁻³	1.30x10 ⁻³	1.29x10 ⁻³
Tin	2.23x10 ⁻²	3.11x10 ⁻²	5.37x10 ⁻²	3.34x10 ⁻²	2.28x10 ⁻²	2.61x10 ⁻²	1.81x10 ⁻³	1.86x10 ⁻²	2.94x10 ⁻²	6.24x10 ⁻²	6.32x10 ⁻²	2.79x10 ⁻²	2.11x10 ⁻²
Zinc	2.99	1.46x10 ¹	2.32x10 ¹	1.26x10 ¹	4.21x10 ¹	3.13x10 ¹	7.05	1.77	2.10x10 ¹	1.54x10 ¹	1.64x10 ¹	5.73x10 ¹	4.47x10 ¹

mg/(kg d)	Mallard						Merganser					
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Arsenic	1.65x10 ⁻¹	1.20	8.44x10 ⁻¹	6.12x10 ⁻¹	8.82x10 ⁻²	9.66x10 ⁻²	1.34x10 ⁻²	9.75x10 ⁻²	6.86x10 ⁻²	4.98x10 ⁻²	7.17x10 ⁻³	7.86x10 ⁻³
Cadmium	2.61x10 ⁻¹	2.50	3.59x10 ⁻¹	1.68	4.48x10 ⁻¹	4.59x10 ⁻¹	8.41x10 ⁻³	8.06x10 ⁻²	1.16x10 ⁻²	5.42x10 ⁻²	1.44x10 ⁻²	1.48x10 ⁻²
Copper	1.84x10 ⁻¹	6.48	3.10x10 ⁻¹	1.32	6.44x10 ⁻¹	6.83x10 ⁻¹	1.58x10 ⁻¹	5.57	2.67x10 ⁻¹	1.13	5.53x10 ⁻¹	5.87x10 ⁻¹
Lead	9.83x10 ⁻²	1.74x10 ⁻¹	1.62x10 ⁻¹	3.34x10 ⁻¹	1.56x10 ⁻¹	1.55x10 ⁻¹	6.41x10 ⁻²	1.14x10 ⁻¹	1.06x10 ⁻¹	2.18x10 ⁻¹	1.02x10 ⁻¹	1.01x10 ⁻¹
Manganese	4.71	2.44x10 ¹	2.23	1.52x10 ¹	1.47	1.64	1.52	7.87	7.20x10 ⁻¹	4.90	4.73x10 ⁻¹	5.29x10 ⁻¹
Nickel	3.05x10 ⁻²	1.26x10 ⁻¹	1.33x10 ⁻¹	2.56x10 ⁻¹	2.24x10 ⁻²	2.38x10 ⁻²	2.01x10 ⁻²	8.30x10 ⁻²	8.73x10 ⁻²	1.68x10 ⁻¹	1.47x10 ⁻²	1.56x10 ⁻²
Silver	4.68x10 ⁻³	7.24x10 ⁻³	3.69x10 ⁻²	1.83x10 ⁻²	4.68x10 ⁻³	1.53x10 ⁻⁴	4.38x10 ⁻³	6.79x10 ⁻³	3.46x10 ⁻²	1.71x10 ⁻²	4.38x10 ⁻³	1.43x10 ⁻⁴
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	1.23x10 ¹	4.52x10 ²	5.36	1.00x10 ²	2.29	5.25	6.25	2.29x10 ²	2.72	5.09x10 ¹	1.16	2.66

TABLE 4.4-5 (Cont'd)
PREDICTED INTAKES FOR TERRESTRIAL ANIMALS “REMEDIATION” SCENARIO – FUTURE 3

mg/(kg d)	Scaup						Hoary Marmot					Bear			Wolf Overall
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	
Arsenic	2.87x10 ⁻¹	2.09	1.47	1.07	1.54x10 ⁻¹	1.68x10 ⁻¹	1.08x10 ⁻²	6.01x10 ⁻²	1.30x10 ⁻²	9.10x10 ⁻²	5.53x10 ⁻²	6.12x10 ⁻³	2.39x10 ⁻²	3.83x10 ⁻²	2.79x10 ⁻³
Cadmium	2.42x10 ⁻¹	2.32	3.34x10 ⁻¹	1.56	4.16x10 ⁻¹	4.27x10 ⁻¹	2.79x10 ⁻²	1.54x10 ⁻²	3.73x10 ⁻²	1.99x10 ⁻²	2.47x10 ⁻²	1.01x10 ⁻²	1.13x10 ⁻²	1.52x10 ⁻²	1.57x10 ⁻³
Copper	4.43x10 ⁻¹	1.56x10 ¹	7.47x10 ⁻¹	3.17	1.55	1.65	3.27x10 ⁻¹	3.23x10 ⁻¹	3.72x10 ⁻¹	4.89x10 ⁻¹	4.02x10 ⁻¹	1.54x10 ⁻¹	2.42x10 ⁻¹	6.73x10 ⁻¹	2.96x10 ⁻²
Lead	3.18x10 ⁻¹	5.65x10 ⁻¹	5.25x10 ⁻¹	1.08	5.05x10 ⁻¹	5.02x10 ⁻¹	2.73x10 ⁻²	7.04x10 ⁻¹	4.59x10 ⁻¹	5.55	1.81	2.33x10 ⁻²	2.57x10 ⁻¹	2.21	1.70x10 ⁻¹
Manganese	9.09	4.71x10 ¹	4.31	2.94x10 ¹	2.83	3.17	3.82x10 ¹	3.64x10 ¹	3.97x10 ¹	2.65x10 ¹	7.23x10 ¹	8.93	1.75x10 ¹	1.05x10 ¹	2.15x10 ⁻¹
Nickel	9.83x10 ⁻²	4.07x10 ⁻¹	4.28x10 ⁻¹	8.22x10 ⁻¹	7.21x10 ⁻²	7.66x10 ⁻²	6.19x10 ⁻²	1.88x10 ⁻¹	1.43x10 ⁻¹	1.20x10 ⁻¹	4.79x10 ⁻¹	2.42x10 ⁻²	7.53x10 ⁻²	4.57x10 ⁻²	5.75x10 ⁻³
Silver	4.47x10 ⁻³	6.92x10 ⁻³	3.53x10 ⁻²	1.75x10 ⁻²	4.47x10 ⁻³	1.46x10 ⁻⁴	2.93x10 ⁻³	4.81x10 ⁻³	4.40x10 ⁻³	7.11x10 ⁻³	1.25x10 ⁻²	2.40x10 ⁻³	3.92x10 ⁻³	3.77x10 ⁻³	4.05x10 ⁻⁴
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	6.58x10 ⁻⁴	7.94x10 ⁻⁴	7.72x10 ⁻⁴	7.71x10 ⁻³	5.20x10 ⁻⁴	2.24x10 ⁻⁴	3.75x10 ⁻⁴	1.21x10 ⁻³	9.75x10 ⁻⁵
Tin	n/a	n/a	n/a	n/a	n/a	n/a	2.37x10 ⁻²	1.82x10 ⁻²	2.11x10 ⁻²	9.76x10 ⁻³	2.12x10 ⁻²	7.93x10 ⁻³	9.17x10 ⁻³	7.81x10 ⁻³	2.19x10 ⁻³
Zinc	1.88x10 ¹	6.87x10 ²	8.16	1.53x10 ²	3.49	7.99	3.36	2.86x10 ¹	4.86	1.22x10 ¹	6.76	3.09	1.25x10 ¹	2.98x10 ¹	5.97

mg/(kg d)	Mink						Beaver						Fox		
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Arsenic	6.91x10 ⁻²	5.03x10 ⁻¹	3.54x10 ⁻¹	2.57x10 ⁻¹	3.70x10 ⁻²	4.06x10 ⁻²	7.94x10 ⁻³	4.27x10 ⁻²	2.56x10 ⁻²	1.98x10 ⁻²	5.95x10 ⁻³	6.48x10 ⁻³	3.78x10 ⁻³	2.15x10 ⁻²	4.03x10 ⁻²
Cadmium	9.76x10 ⁻²	9.95x10 ⁻¹	1.35x10 ⁻¹	6.31x10 ⁻¹	1.72x10 ⁻¹	1.76x10 ⁻¹	1.57x10 ⁻¹	1.14	2.01x10 ⁻¹	8.31x10 ⁻¹	2.41x10 ⁻¹	2.89x10 ⁻¹	2.32x10 ⁻²	4.54x10 ⁻²	2.18x10 ⁻¹
Copper	3.28x10 ⁻¹	1.15x10 ¹	5.53x10 ⁻¹	2.34	1.15	1.22	7.06x10 ⁻²	1.25	9.39x10 ⁻²	3.03x10 ⁻¹	1.56x10 ⁻¹	1.85x10 ⁻¹	2.93x10 ⁻²	5.77x10 ⁻²	1.92x10 ⁻¹
Lead	2.14x10 ⁻¹	4.02x10 ⁻¹	3.53x10 ⁻¹	7.31x10 ⁻¹	3.39x10 ⁻¹	3.40x10 ⁻¹	4.44x10 ⁻²	2.17x10 ⁻¹	7.18x10 ⁻²	1.61x10 ⁻¹	6.91x10 ⁻²	8.39x10 ⁻²	8.99x10 ⁻³	9.66x10 ⁻²	8.76x10 ⁻¹
Manganese	4.02	2.08x10 ¹	1.91	1.30x10 ¹	1.25	1.40	6.79	2.71x10 ¹	6.53	7.41	6.45	5.98	8.63x10 ⁻¹	9.55x10 ⁻¹	6.81x10 ⁻¹
Nickel	6.50x10 ⁻²	2.69x10 ⁻¹	2.83x10 ⁻¹	5.44x10 ⁻¹	4.77x10 ⁻²	5.06x10 ⁻²	3.44x10 ⁻²	7.20x10 ⁻²	6.85x10 ⁻²	1.18x10 ⁻¹	3.17x10 ⁻²	4.09x10 ⁻²	8.14x10 ⁻³	5.07x10 ⁻²	2.69x10 ⁻²
Silver	6.76x10 ⁻³	1.05x10 ⁻²	5.33x10 ⁻²	2.64x10 ⁻²	6.76x10 ⁻³	2.21x10 ⁻⁴	2.22x10 ⁻³	3.79x10 ⁻³	1.69x10 ⁻²	8.99x10 ⁻³	2.22x10 ⁻³	7.53x10 ⁻⁴	9.98x10 ⁻⁴	1.79x10 ⁻³	1.55x10 ⁻³
Thallium	4.05x10 ⁻⁷	2.02x10 ⁻⁶	4.05x10 ⁻⁷	5.19x10 ⁻⁷	4.05x10 ⁻⁷	5.19x10 ⁻⁷	9.02x10 ⁻⁵	9.29x10 ⁻⁵	9.02x10 ⁻⁵	1.19x10 ⁻⁴	9.02x10 ⁻⁵	1.19x10 ⁻⁴	2.00x10 ⁻⁵	3.46x10 ⁻⁵	2.51x10 ⁻⁵
Tin	1.44x10 ⁻⁵	1.05x10 ⁻⁵	1.44x10 ⁻⁵	2.48x10 ⁻⁵	1.44x10 ⁻⁵	2.48x10 ⁻⁵	1.90x10 ⁻³	4.79x10 ⁻³	1.90x10 ⁻³	2.05x10 ⁻³	1.90x10 ⁻³	2.05x10 ⁻³	1.64x10 ⁻³	3.13x10 ⁻³	2.50x10 ⁻³
Zinc	1.17x10 ¹	4.29x10 ²	5.12	9.54x10 ¹	2.20	5.02	3.36	5.40x10 ¹	2.59	1.40x10 ¹	2.24	3.42	6.55x10 ⁻¹	2.13x10 ¹	9.49x10 ¹

TABLE 4.4-6
PREDICTED INTAKES FOR TERRESTRIAL ANIMALS “TREAT ALL FLOWS” SCENARIO

mg/(kg d)	Caribou Overall	Hare					Moose Overall	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Arsenic	3.76x10 ⁻²	3.42x10 ⁻²	9.83x10 ⁻²	4.49x10 ⁻²	2.09x10 ⁻¹	1.23x10 ⁻¹	1.81x10 ⁻²	1.10x10 ⁻²	4.60x10 ⁻²	9.92x10 ⁻²	5.73x10 ⁻²	2.43x10 ⁻¹	1.29x10 ⁻¹
Cadmium	1.11x10 ⁻²	2.84x10 ⁻¹	2.13x10 ⁻¹	6.72x10 ⁻²	2.51x10 ⁻¹	3.11x10 ⁻¹	1.01x10 ⁻¹	4.34x10 ⁻³	4.35x10 ⁻¹	3.34x10 ⁻¹	7.53x10 ⁻²	3.88x10 ⁻¹	4.84x10 ⁻¹
Copper	1.31x10 ⁻¹	4.30x10 ⁻¹	5.64x10 ⁻¹	5.01x10 ⁻¹	8.66x10 ⁻¹	6.61x10 ⁻¹	1.36x10 ⁻¹	2.18x10 ⁻¹	4.53x10 ⁻¹	6.76x10 ⁻¹	5.64x10 ⁻¹	9.33x10 ⁻¹	7.46x10 ⁻¹
Lead	2.11	6.39x10 ⁻²	1.26	1.66	1.04x10 ¹	3.86	1.83x10 ⁻¹	4.15x10 ⁻²	6.70x10 ⁻²	1.16	2.02	9.79	3.58
Manganese	3.17	6.08x10 ¹	6.06x10 ¹	3.16x10 ¹	2.40x10 ¹	8.65x10 ¹	8.39	1.88x10 ¹	6.90x10 ¹	6.89x10 ¹	2.37x10 ¹	1.90x10 ¹	8.60x10 ¹
Nickel	2.69x10 ⁻²	2.03x10 ⁻¹	3.45x10 ⁻¹	1.16x10 ⁻¹	3.01x10 ⁻¹	5.67x10 ⁻¹	6.26x10 ⁻²	9.72x10 ⁻²	2.76x10 ⁻¹	3.90x10 ⁻¹	7.76x10 ⁻²	3.83x10 ⁻¹	5.71x10 ⁻¹
Silver	5.08x10 ⁻³	5.62x10 ⁻³	1.09x10 ⁻²	5.78x10 ⁻³	1.51x10 ⁻²	1.13x10 ⁻²	1.52x10 ⁻³	2.16x10 ⁻³	5.44x10 ⁻³	1.29x10 ⁻²	5.10x10 ⁻³	1.57x10 ⁻²	7.82x10 ⁻³
Thallium	1.60x10 ⁻³	8.77x10 ⁻⁴	1.12x10 ⁻³	1.11x10 ⁻³	4.37x10 ⁻³	9.96x10 ⁻⁴	1.42x10 ⁻⁴	1.84x10 ⁻³	9.92x10 ⁻⁴	1.28x10 ⁻³	1.27x10 ⁻³	1.30x10 ⁻³	1.29x10 ⁻³
Tin	2.23x10 ⁻²	3.11x10 ⁻²	5.37x10 ⁻²	3.34x10 ⁻²	2.28x10 ⁻²	2.61x10 ⁻²	1.81x10 ⁻³	1.86x10 ⁻²	2.94x10 ⁻²	6.24x10 ⁻²	6.32x10 ⁻²	2.79x10 ⁻²	2.11x10 ⁻²
Zinc	2.97	1.46x10 ¹	2.32x10 ¹	1.25x10 ¹	4.20x10 ¹	3.12x10 ¹	4.97	1.76	2.10x10 ¹	1.54x10 ¹	1.63x10 ¹	5.72x10 ¹	4.46x10 ¹

mg/(kg d)	Mallard						Merganser					
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Arsenic	1.65x10 ⁻¹	2.21x10 ⁻¹	8.44x10 ⁻¹	5.96x10 ⁻¹	8.82x10 ⁻²	9.13x10 ⁻²	1.34x10 ⁻²	1.80x10 ⁻²	6.86x10 ⁻²	4.85x10 ⁻²	7.17x10 ⁻³	7.42x10 ⁻³
Cadmium	2.61x10 ⁻¹	6.55x10 ⁻¹	3.59x10 ⁻¹	1.38	4.48x10 ⁻¹	4.49x10 ⁻¹	8.41x10 ⁻³	2.11x10 ⁻²	1.16x10 ⁻²	4.46x10 ⁻²	1.44x10 ⁻²	1.45x10 ⁻²
Copper	1.84x10 ⁻¹	5.89x10 ⁻¹	3.10x10 ⁻¹	1.82	6.44x10 ⁻¹	6.43x10 ⁻¹	1.58x10 ⁻¹	5.06x10 ⁻¹	2.67x10 ⁻¹	1.56	5.53x10 ⁻¹	5.53x10 ⁻¹
Lead	9.83x10 ⁻²	1.56x10 ⁻¹	1.62x10 ⁻¹	3.39x10 ⁻¹	1.56x10 ⁻¹	1.55x10 ⁻¹	6.41x10 ⁻²	1.02x10 ⁻¹	1.06x10 ⁻¹	2.21x10 ⁻¹	1.02x10 ⁻¹	1.01x10 ⁻¹
Manganese	4.71	3.06	2.23	2.33	1.47	1.50	1.52	9.86x10 ⁻¹	7.20x10 ⁻¹	7.53x10 ⁻¹	4.73x10 ⁻¹	4.85x10 ⁻¹
Nickel	3.05x10 ⁻²	8.40x10 ⁻²	1.33x10 ⁻¹	2.21x10 ⁻¹	2.24x10 ⁻²	2.35x10 ⁻²	2.01x10 ⁻²	5.52x10 ⁻²	8.73x10 ⁻²	1.45x10 ⁻¹	1.47x10 ⁻²	1.55x10 ⁻²
Silver	4.68x10 ⁻³	4.68x10 ⁻³	3.69x10 ⁻²	1.79x10 ⁻²	4.68x10 ⁻³	1.35x10 ⁻⁴	4.38x10 ⁻³	4.38x10 ⁻³	3.46x10 ⁻²	1.68x10 ⁻²	4.38x10 ⁻³	1.26x10 ⁻⁴
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Tin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	1.23x10 ¹	7.90	5.36	8.38	2.29	2.43	6.25	4.00	2.72	4.24	1.16	1.23

TABLE 4.4-6 (Cont'd)
PREDICTED INTAKES FOR TERRESTRIAL ANIMALS “TREAT ALL FLOWS” SCENARIO

mg/(kg d)	Scaup						Hoary Marmot					Bear			Wolf
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall
Arsenic	2.87x10 ⁻¹	3.85x10 ⁻¹	1.47	1.04	1.54x10 ⁻¹	1.59x10 ⁻¹	1.08x10 ⁻²	6.01x10 ⁻²	1.24x10 ⁻²	9.05x10 ⁻²	5.48x10 ⁻²	6.11x10 ⁻³	2.38x10 ⁻²	3.24x10 ⁻²	2.74x10 ⁻³
Cadmium	2.42x10 ⁻¹	6.09x10 ⁻¹	3.34x10 ⁻¹	1.28	4.16x10 ⁻¹	4.17x10 ⁻¹	2.79x10 ⁻²	1.54x10 ⁻²	3.71x10 ⁻²	1.98x10 ⁻²	2.45x10 ⁻²	9.99x10 ⁻³	1.01x10 ⁻²	8.82x10 ⁻³	1.23x10 ⁻³
Copper	4.43x10 ⁻¹	1.42	7.47x10 ⁻¹	4.37	1.55	1.55	3.27x10 ⁻¹	3.23x10 ⁻¹	3.68x10 ⁻¹	4.85x10 ⁻¹	3.98x10 ⁻¹	1.52x10 ⁻¹	2.77x10 ⁻¹	2.35x10 ⁻¹	2.30x10 ⁻²
Lead	3.18x10 ⁻¹	5.07x10 ⁻¹	5.25x10 ⁻¹	1.10	5.05x10 ⁻¹	5.02x10 ⁻¹	2.73x10 ⁻²	7.04x10 ⁻¹	4.59x10 ⁻¹	5.55	1.81	2.33x10 ⁻²	2.57x10 ⁻¹	2.21	1.70x10 ⁻¹
Manganese	9.09	5.90	4.31	4.51	2.83	2.90	3.82x10 ¹	3.64x10 ¹	3.97x10 ¹	2.64x10 ¹	7.22x10 ¹	8.93	1.72x10 ¹	9.97	2.13x10 ⁻¹
Nickel	9.83x10 ⁻²	2.70x10 ⁻¹	4.28x10 ⁻¹	7.13x10 ⁻¹	7.21x10 ⁻²	7.58x10 ⁻²	6.19x10 ⁻²	1.88x10 ⁻¹	1.43x10 ⁻¹	1.20x10 ⁻¹	4.79x10 ⁻¹	2.41x10 ⁻²	7.41x10 ⁻²	4.43x10 ⁻²	5.64x10 ⁻³
Silver	4.47x10 ⁻³	4.47x10 ⁻³	3.53x10 ⁻²	1.71x10 ⁻²	4.47x10 ⁻³	1.29x10 ⁻⁴	2.93x10 ⁻³	4.80x10 ⁻³	4.39x10 ⁻³	7.10x10 ⁻³	1.25x10 ⁻²	2.40x10 ⁻³	3.88x10 ⁻³	3.51x10 ⁻³	4.03x10 ⁻⁴
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	6.58x10 ⁻⁴	7.94x10 ⁻⁴	7.72x10 ⁻⁴	7.71x10 ⁻³	5.20x10 ⁻⁴	2.24x10 ⁻⁴	3.75x10 ⁻⁴	1.21x10 ⁻³	9.75x10 ⁻⁵
Tin	n/a	n/a	n/a	n/a	n/a	n/a	2.37x10 ⁻²	1.82x10 ⁻²	2.11x10 ⁻²	9.76x10 ⁻³	2.12x10 ⁻²	7.93x10 ⁻³	9.17x10 ⁻³	7.81x10 ⁻³	2.19x10 ⁻³
Zinc	1.88x10 ¹	1.20x10 ¹	8.16	1.27x10 ¹	3.49	3.69	3.36	2.86x10 ¹	4.72	1.21x10 ¹	6.63	2.51	6.87	4.85	4.37

mg/(kg d)	Mink						Beaver						Fox		
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Arsenic	6.91x10 ⁻²	9.26x10 ⁻²	3.54x10 ⁻¹	2.50x10 ⁻¹	3.70x10 ⁻²	3.83x10 ⁻²	7.94x10 ⁻³	1.74x10 ⁻²	2.56x10 ⁻²	1.94x10 ⁻²	5.95x10 ⁻³	6.34x10 ⁻³	3.78x10 ⁻³	2.11x10 ⁻²	1.49x10 ⁻²
Cadmium	9.76x10 ⁻²	2.47x10 ⁻¹	1.35x10 ⁻¹	5.28x10 ⁻¹	1.72x10 ⁻¹	1.72x10 ⁻¹	1.57x10 ⁻¹	3.26x10 ⁻¹	2.01x10 ⁻¹	6.98x10 ⁻¹	2.41x10 ⁻¹	2.85x10 ⁻¹	2.32x10 ⁻²	6.20x10 ⁻²	2.13x10 ⁻²
Copper	3.28x10 ⁻¹	1.05	5.53x10 ⁻¹	3.23	1.15	1.14	7.06x10 ⁻²	1.56x10 ⁻¹	9.39x10 ⁻²	3.95x10 ⁻¹	1.56x10 ⁻¹	1.78x10 ⁻¹	2.93x10 ⁻²	6.84x10 ⁻²	6.53x10 ⁻²
Lead	2.14x10 ⁻¹	3.63x10 ⁻¹	3.53x10 ⁻¹	7.40x10 ⁻¹	3.39x10 ⁻¹	3.40x10 ⁻¹	4.44x10 ⁻²	2.09x10 ⁻¹	7.18x10 ⁻²	1.63x10 ⁻¹	6.91x10 ⁻²	8.39x10 ⁻²	8.99x10 ⁻³	9.66x10 ⁻²	8.76x10 ⁻¹
Manganese	4.02	2.61	1.91	1.99	1.25	1.29	6.79	2.49x10 ¹	6.53	6.05	6.45	5.96	8.63x10 ⁻¹	9.25x10 ⁻¹	6.31x10 ⁻¹
Nickel	6.50x10 ⁻²	1.79x10 ⁻¹	2.83x10 ⁻¹	4.71x10 ⁻¹	4.77x10 ⁻²	5.01x10 ⁻²	3.44x10 ⁻²	5.79x10 ⁻²	6.85x10 ⁻²	1.07x10 ⁻¹	3.17x10 ⁻²	4.09x10 ⁻²	8.14x10 ⁻³	4.60x10 ⁻²	2.10x10 ⁻²
Silver	6.76x10 ⁻³	6.76x10 ⁻³	5.33x10 ⁻²	2.58x10 ⁻²	6.76x10 ⁻³	1.95x10 ⁻⁴	2.22x10 ⁻³	2.62x10 ⁻³	1.69x10 ⁻²	8.82x10 ⁻³	2.22x10 ⁻³	7.45x10 ⁻⁴	9.98x10 ⁻⁴	1.77x10 ⁻³	1.39x10 ⁻³
Thallium	4.05x10 ⁻⁷	2.02x10 ⁻⁶	4.05x10 ⁻⁷	5.19x10 ⁻⁷	4.05x10 ⁻⁷	5.19x10 ⁻⁷	9.02x10 ⁻⁵	9.29x10 ⁻⁵	9.02x10 ⁻⁵	1.19x10 ⁻⁴	9.02x10 ⁻⁵	1.19x10 ⁻⁴	2.00x10 ⁻⁵	3.46x10 ⁻⁵	2.51x10 ⁻⁵
Tin	1.44x10 ⁻⁵	1.05x10 ⁻⁵	1.44x10 ⁻⁵	2.48x10 ⁻⁵	1.44x10 ⁻⁵	2.48x10 ⁻⁵	1.90x10 ⁻³	4.79x10 ⁻³	1.90x10 ⁻³	2.05x10 ⁻³	1.90x10 ⁻³	2.05x10 ⁻³	1.64x10 ⁻³	3.13x10 ⁻³	2.50x10 ⁻³
Zinc	1.17x10 ¹	7.57	5.12	7.99	2.20	2.34	3.36	4.72	2.59	3.76	2.24	3.10	6.55x10 ⁻¹	2.07	2.42

4.5 HUMAN INTAKES

Intakes of COPC by humans located at the site were predicted based on the dietary characteristics provided in Section 3.2 and the locations in the study area from which the various components of the diet were assumed to be obtained (see Table 3.2-1). Appendix E provides the equations used in developing these intakes. In short, the concentrations of the various COPC in different dietary components (by location) are considered in their intakes. In the “Existing” and “No Intervention” scenarios, it was assumed that campers were located off site and in the Swim Lakes area (Background). After remediation, it was assumed that conditions at the site were improved such that campers would be present near Rose Creek and Vangorda Creek as well as off site. Appendix G provides a sample calculation based on zinc.

4.5.1 “Existing” Scenario

As discussed above, Camper 1 was assumed to live off site but hunt, trap and gather berries on site. Camper 2 was assumed to be at a background location near Swim Lakes and only hunt for large game on site. Adults, children and toddlers were considered. As seen from Table 4.5-1, intakes of COPC for toddlers are higher than for older children or adults. Not surprising, the intakes associated with background exposures (Camper 2) are lower than those associated with the Camper 1 who goes on the site to trap small mammals and collect berries around the Faro location. It has been assumed that these individuals spend 1.5 months of the year on site and consume meat and fish obtained from the site every other day for the rest of the year. Measured concentrations of caribou and moose flesh were used in the calculations.

Table 4.5-2 provides the percentage breakdown by pathway. As seen from this table, consumption of fish from the site represents the largest exposure pathway for arsenic, lead (Camper 2), manganese and nickel. For cadmium, copper, silver, thallium, tin and zinc, consumption of moose represents the largest exposure pathway. This is not surprising since moose represents the largest dietary component. For lead exposures in Camper 1 (toddlers), soil ingestion is the largest exposure pathway whereas for children and adults, ingestion of hoary marmot represents the largest exposure pathway. For thallium and tin, there were no measurements in the aquatic environment or in soil; therefore there are no calculations for exposure pathways for ingestion of water, soil, fish and ducks as well as there are no dermal contact exposure calculations. It has been assumed that Labrador tea is only consumed by adults and Table 4.5-2 shows that Labrador tea accounts for between 0.1% and 12% of the exposure pathways for Camper 1 and between 0.1% and 39% of the exposure for Camper 2. Manganese present in Labrador tea accounts for the highest intakes of the COPC.

TABLE 4.5-1
HUMAN INTAKES OF COPC FOR “EXISTING” SCENARIO

Arsenic mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	1.11x10 ⁻⁵	4.96x10 ⁻⁵	5.63x10 ⁻⁸	5.23x10 ⁻⁸	3.45x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.70x10 ⁻⁸	1.22x10 ⁻⁶	2.10x10 ⁻⁶	3.46x10 ⁻⁷	0.00	1.23x10 ⁻⁵	8.24x10 ⁻⁵	3.39x10 ⁻⁷
Camper 1 - Child	7.44x10 ⁻⁶	4.03x10 ⁻⁵	4.02x10 ⁻⁸	3.74x10 ⁻⁸	2.46x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.21x10 ⁻⁸	8.71x10 ⁻⁷	1.50x10 ⁻⁶	1.97x10 ⁻⁷	0.00	1.54x10 ⁻⁶	5.59x10 ⁻⁵	2.58x10 ⁻⁷
Camper 1 - Adult	6.49x10 ⁻⁶	2.31x10 ⁻⁵	2.53x10 ⁻⁸	2.35x10 ⁻⁸	1.55x10 ⁻⁸	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.61x10 ⁻⁹	5.48x10 ⁻⁷	9.43x10 ⁻⁷	8.41x10 ⁻⁸	4.51x10 ⁻⁸	7.18x10 ⁻⁷	3.45x10 ⁻⁵	1.97x10 ⁻⁷
Camper 2 - Toddler	2.62x10 ⁻⁶	1.17x10 ⁻⁵	9.23x10 ⁻⁹	6.22x10 ⁻⁹	1.50x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.70x10 ⁻⁸	2.31x10 ⁻⁷	4.95x10 ⁻⁷	4.91x10 ⁻⁷	0.00	1.14x10 ⁻⁶	2.23x10 ⁻⁵	3.13x10 ⁻⁸
Camper 2 - Child	1.75x10 ⁻⁶	9.49x10 ⁻⁶	6.59x10 ⁻⁹	4.44x10 ⁻⁹	1.07x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.21x10 ⁻⁸	1.65x10 ⁻⁷	3.53x10 ⁻⁷	2.80x10 ⁻⁷	0.00	1.43x10 ⁻⁷	1.62x10 ⁻⁵	2.38x10 ⁻⁸
Camper 2 - Adult	1.53x10 ⁻⁶	5.45x10 ⁻⁶	4.14x10 ⁻⁹	2.79x10 ⁻⁹	6.73x10 ⁻⁹	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.61x10 ⁻⁹	1.04x10 ⁻⁷	2.22x10 ⁻⁷	1.19x10 ⁻⁷	4.51x10 ⁻⁸	6.63x10 ⁻⁸	1.01x10 ⁻⁵	1.82x10 ⁻⁸

Cadmium mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	2.66x10 ⁻⁶	4.11x10 ⁻⁵	1.76x10 ⁻⁸	2.97x10 ⁻⁹	2.08x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.69x10 ⁻⁹	1.56x10 ⁻⁶	2.35x10 ⁻⁶	5.78x10 ⁻⁷	0.00	1.16x10 ⁻⁶	9.77x10 ⁻⁵	3.20x10 ⁻⁸
Camper 1 - Child	1.78x10 ⁻⁶	3.34x10 ⁻⁵	1.26x10 ⁻⁸	2.12x10 ⁻⁹	1.48x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.21x10 ⁻⁹	1.11x10 ⁻⁶	1.68x10 ⁻⁶	3.29x10 ⁻⁷	0.00	1.45x10 ⁻⁷	7.29x10 ⁻⁵	2.43x10 ⁻⁸
Camper 1 - Adult	1.55x10 ⁻⁶	1.92x10 ⁻⁵	7.90x10 ⁻⁹	1.33x10 ⁻⁹	9.34x10 ⁻⁸	2.09x10 ⁻⁵	6.81x10 ⁻⁷	7.60x10 ⁻¹⁰	6.99x10 ⁻⁷	1.06x10 ⁻⁶	1.40x10 ⁻⁷	2.71x10 ⁻⁸	6.76x10 ⁻⁸	4.44x10 ⁻⁵	1.85x10 ⁻⁸
Camper 2 - Toddler	2.27x10 ⁻⁶	3.51x10 ⁻⁵	1.99x10 ⁻⁸	4.20x10 ⁻⁹	1.57x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.69x10 ⁻⁹	1.75x10 ⁻⁶	2.01x10 ⁻⁶	2.18x10 ⁻⁷	0.00	1.50x10 ⁻⁶	9.11x10 ⁻⁵	4.12x10 ⁻⁸
Camper 2 - Child	1.52x10 ⁻⁶	2.85x10 ⁻⁵	1.42x10 ⁻⁸	3.00x10 ⁻⁹	1.12x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.21x10 ⁻⁹	1.25x10 ⁻⁶	1.44x10 ⁻⁶	1.24x10 ⁻⁷	0.00	1.87x10 ⁻⁷	6.75x10 ⁻⁵	3.13x10 ⁻⁸
Camper 2 - Adult	1.33x10 ⁻⁶	1.64x10 ⁻⁵	8.95x10 ⁻⁹	1.88x10 ⁻⁹	7.07x10 ⁻⁸	2.09x10 ⁻⁵	6.81x10 ⁻⁷	7.60x10 ⁻¹⁰	7.84x10 ⁻⁷	9.03x10 ⁻⁷	5.30x10 ⁻⁸	2.71x10 ⁻⁸	8.72x10 ⁻⁸	4.12x10 ⁻⁵	2.39x10 ⁻⁸

Copper mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	2.95x10 ⁻⁵	1.45x10 ⁻³	1.17x10 ⁻⁶	1.40x10 ⁻⁶	2.70x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.63x10 ⁻⁶	2.34x10 ⁻⁶	2.36x10 ⁻⁶	1.85x10 ⁻⁵	0.00	3.49x10 ⁻⁵	4.93x10 ⁻³	3.00x10 ⁻⁶
Camper 1 - Child	1.97x10 ⁻⁵	1.18x10 ⁻³	8.34x10 ⁻⁷	1.00x10 ⁻⁶	1.93x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.17x10 ⁻⁶	1.67x10 ⁻⁶	1.68x10 ⁻⁶	1.05x10 ⁻⁵	0.00	4.37x10 ⁻⁶	3.64x10 ⁻³	2.28x10 ⁻⁶
Camper 1 - Adult	1.72x10 ⁻⁵	6.76x10 ⁻⁴	5.25x10 ⁻⁷	6.30x10 ⁻⁷	1.21x10 ⁻⁶	1.31x10 ⁻³	2.08x10 ⁻⁴	7.33x10 ⁻⁷	1.05x10 ⁻⁶	1.06x10 ⁻⁶	4.50x10 ⁻⁶	5.86x10 ⁻⁶	2.03x10 ⁻⁶	2.23x10 ⁻³	1.74x10 ⁻⁶
Camper 2 - Toddler	2.27x10 ⁻⁵	1.11x10 ⁻³	5.80x10 ⁻⁷	9.47x10 ⁻⁷	1.96x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.63x10 ⁻⁶	1.14x10 ⁻⁶	1.81x10 ⁻⁶	8.46x10 ⁻⁶	0.00	8.76x10 ⁻⁶	4.54x10 ⁻³	7.55x10 ⁻⁷
Camper 2 - Child	1.51x10 ⁻⁵	9.02x10 ⁻⁴	4.14x10 ⁻⁷	6.76x10 ⁻⁷	1.40x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.17x10 ⁻⁶	8.11x10 ⁻⁷	1.29x10 ⁻⁶	4.82x10 ⁻⁶	0.00	1.10x10 ⁻⁶	3.35x10 ⁻³	5.73x10 ⁻⁷
Camper 2 - Adult	1.32x10 ⁻⁵	5.18x10 ⁻⁴	2.60x10 ⁻⁷	4.25x10 ⁻⁷	8.80x10 ⁻⁷	1.31x10 ⁻³	2.08x10 ⁻⁴	7.33x10 ⁻⁷	5.10x10 ⁻⁷	8.12x10 ⁻⁷	2.06x10 ⁻⁶	5.86x10 ⁻⁶	5.11x10 ⁻⁷	2.06x10 ⁻³	4.38x10 ⁻⁷

TABLE 4.5-1 (Cont'd)
HUMAN INTAKES OF COPC FOR “EXISTING” SCENARIO

Lead mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	1.11x10 ⁻⁵	5.41x10 ⁻⁵	1.96x10 ⁻⁴	2.25x10 ⁻⁴	7.00x10 ⁻⁷	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.24x10 ⁻⁸	9.81x10 ⁻⁶	9.99x10 ⁻⁸	3.45x10 ⁻⁶	0.00	5.55x10 ⁻⁴	1.10x10 ⁻³	2.87x10 ⁻⁶
Camper 1 - Child	7.40x10 ⁻⁶	4.39x10 ⁻⁵	1.40x10 ⁻⁴	1.60x10 ⁻⁴	4.99x10 ⁻⁷	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.87x10 ⁻⁹	7.00x10 ⁻⁶	7.13x10 ⁻⁸	1.96x10 ⁻⁶	0.00	6.96x10 ⁻⁵	4.60x10 ⁻⁴	2.18x10 ⁻⁶
Camper 1 - Adult	6.45x10 ⁻⁶	2.52x10 ⁻⁵	8.82x10 ⁻⁵	1.01x10 ⁻⁴	3.14x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.58x10 ⁻⁹	4.40x10 ⁻⁶	4.48x10 ⁻⁸	8.39x10 ⁻⁷	2.34x10 ⁻⁶	3.24x10 ⁻⁵	2.79x10 ⁻⁴	1.66x10 ⁻⁶
Camper 2 - Toddler	1.94x10 ⁻⁵	9.47x10 ⁻⁵	1.21x10 ⁻⁶	1.10x10 ⁻⁶	8.70x10 ⁻⁷	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.24x10 ⁻⁸	6.72x10 ⁻⁸	1.75x10 ⁻⁷	2.21x10 ⁻⁷	0.00	6.98x10 ⁻⁶	1.65x10 ⁻⁴	3.61x10 ⁻⁸
Camper 2 - Child	1.30x10 ⁻⁵	7.70x10 ⁻⁵	8.62x10 ⁻⁷	7.88x10 ⁻⁷	6.21x10 ⁻⁷	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.87x10 ⁻⁹	4.80x10 ⁻⁸	1.25x10 ⁻⁷	1.26x10 ⁻⁷	0.00	8.75x10 ⁻⁷	1.22x10 ⁻⁴	2.74x10 ⁻⁸
Camper 2 - Adult	1.13x10 ⁻⁵	4.42x10 ⁻⁵	5.42x10 ⁻⁷	4.96x10 ⁻⁷	3.91x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.58x10 ⁻⁹	3.02x10 ⁻⁸	7.85x10 ⁻⁸	5.38x10 ⁻⁸	2.34x10 ⁻⁶	4.07x10 ⁻⁷	7.81x10 ⁻⁵	2.09x10 ⁻⁸

Manganese mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	5.11x10 ⁻⁴	7.21x10 ⁻³	1.62x10 ⁻⁶	3.83x10 ⁻⁶	4.44x10 ⁻⁶	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.04x10 ⁻⁶	4.78x10 ⁻⁶	3.31x10 ⁻⁶	5.99x10 ⁻⁴	0.00	3.24x10 ⁻⁴	9.39x10 ⁻³	2.79x10 ⁻⁵
Camper 1 - Child	3.42x10 ⁻⁴	5.85x10 ⁻³	1.16x10 ⁻⁶	2.74x10 ⁻⁶	3.17x10 ⁻⁶	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.03x10 ⁻⁶	3.41x10 ⁻⁶	2.36x10 ⁻⁶	3.41x10 ⁻⁴	0.00	4.06x10 ⁻⁵	7.12x10 ⁻³	2.12x10 ⁻⁵
Camper 1 - Adult	2.98x10 ⁻⁴	3.36x10 ⁻³	7.28x10 ⁻⁷	1.72x10 ⁻⁶	1.99x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.16x10 ⁻⁶	2.15x10 ⁻⁶	1.49x10 ⁻⁶	1.46x10 ⁻⁴	6.11x10 ⁻⁴	1.89x10 ⁻⁵	4.78x10 ⁻³	1.62x10 ⁻⁵
Camper 2 - Toddler	6.36x10 ⁻⁵	8.97x10 ⁻⁴	4.10x10 ⁻⁶	5.53x10 ⁻⁶	4.06x10 ⁻⁶	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.04x10 ⁻⁶	1.73x10 ⁻⁵	4.12x10 ⁻⁷	3.43x10 ⁻⁴	0.00	6.06x10 ⁻⁴	2.68x10 ⁻³	5.22x10 ⁻⁵
Camper 2 - Child	4.26x10 ⁻⁵	7.29x10 ⁻⁴	2.93x10 ⁻⁶	3.95x10 ⁻⁶	2.90x10 ⁻⁶	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.03x10 ⁻⁶	1.23x10 ⁻⁵	2.94x10 ⁻⁷	1.95x10 ⁻⁴	0.00	7.60x10 ⁻⁵	1.59x10 ⁻³	3.97x10 ⁻⁵
Camper 2 - Adult	3.71x10 ⁻⁵	4.19x10 ⁻⁴	1.84x10 ⁻⁶	2.48x10 ⁻⁶	1.82x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.16x10 ⁻⁶	7.76x10 ⁻⁶	1.85x10 ⁻⁷	8.33x10 ⁻⁵	6.11x10 ⁻⁴	3.54x10 ⁻⁵	1.53x10 ⁻³	3.03x10 ⁻⁵

Nickel mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	3.19x10 ⁻⁵	1.10x10 ⁻⁴	2.44x10 ⁻⁷	2.08x10 ⁻⁷	6.46x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.37x10 ⁻⁷	5.75x10 ⁻⁶	2.65x10 ⁻⁶	4.82x10 ⁻⁶	0.00	6.94x10 ⁻⁶	1.84x10 ⁻⁴	2.09x10 ⁻⁶
Camper 1 - Child	2.13x10 ⁻⁵	8.95x10 ⁻⁵	1.74x10 ⁻⁷	1.48x10 ⁻⁷	4.61x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.12x10 ⁻⁷	4.11x10 ⁻⁶	1.89x10 ⁻⁶	2.74x10 ⁻⁶	0.00	8.70x10 ⁻⁷	1.36x10 ⁻⁴	1.59x10 ⁻⁶
Camper 1 - Adult	1.86x10 ⁻⁵	5.14x10 ⁻⁵	1.09x10 ⁻⁷	9.32x10 ⁻⁸	2.90x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	1.96x10 ⁻⁷	2.58x10 ⁻⁶	1.19x10 ⁻⁶	1.17x10 ⁻⁶	9.92x10 ⁻⁷	4.05x10 ⁻⁷	8.63x10 ⁻⁵	1.21x10 ⁻⁶
Camper 2 - Toddler	4.55x10 ⁻⁶	1.57x10 ⁻⁵	1.64x10 ⁻⁷	1.07x10 ⁻⁷	2.39x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.37x10 ⁻⁷	4.15x10 ⁻⁶	3.78x10 ⁻⁷	1.35x10 ⁻⁶	0.00	4.04x10 ⁻⁶	5.18x10 ⁻⁵	1.22x10 ⁻⁶
Camper 2 - Child	3.04x10 ⁻⁶	1.27x10 ⁻⁵	1.17x10 ⁻⁷	7.66x10 ⁻⁸	1.71x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.12x10 ⁻⁷	2.96x10 ⁻⁶	2.69x10 ⁻⁷	7.70x10 ⁻⁷	0.00	5.07x10 ⁻⁷	3.57x10 ⁻⁵	9.26x10 ⁻⁷
Camper 2 - Adult	2.65x10 ⁻⁶	7.32x10 ⁻⁶	7.38x10 ⁻⁸	4.82x10 ⁻⁸	1.07x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	1.96x10 ⁻⁷	1.86x10 ⁻⁶	1.69x10 ⁻⁷	3.29x10 ⁻⁷	9.92x10 ⁻⁷	2.36x10 ⁻⁷	2.33x10 ⁻⁵	7.07x10 ⁻⁷

TABLE 4.5-1 (Cont'd)
HUMAN INTAKES OF COPC FOR “EXISTING” SCENARIO

Silver mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	7.39x10 ⁻⁷	1.84x10 ⁻⁵	6.12x10 ⁻⁹	6.18x10 ⁻⁹	1.57x10 ⁻⁸	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.84x10 ⁻⁹	1.58x10 ⁻⁷	8.55x10 ⁻⁸	9.93x10 ⁻⁸	0.00	6.06x10 ⁻⁷	2.74x10 ⁻⁴	1.31x10 ⁻⁷
Camper 1 - Child	4.94x10 ⁻⁷	1.49x10 ⁻⁵	4.36x10 ⁻⁹	4.41x10 ⁻⁹	1.12x10 ⁻⁸	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.46x10 ⁻⁹	1.13x10 ⁻⁷	6.10x10 ⁻⁸	5.66x10 ⁻⁸	0.00	7.60x10 ⁻⁸	1.97x10 ⁻⁴	9.91x10 ⁻⁸
Camper 1 - Adult	4.31x10 ⁻⁷	8.58x10 ⁻⁶	2.74x10 ⁻⁹	2.77x10 ⁻⁹	7.03x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.17x10 ⁻⁹	7.08x10 ⁻⁸	3.84x10 ⁻⁸	2.41x10 ⁻⁸	9.02x10 ⁻⁹	3.54x10 ⁻⁸	1.23x10 ⁻⁴	7.57x10 ⁻⁸
Camper 2 - Toddler	4.55x10 ⁻⁷	1.13x10 ⁻⁵	2.28x10 ⁻⁹	2.54x10 ⁻⁹	8.40x10 ⁻⁹	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.84x10 ⁻⁹	5.46x10 ⁻⁸	5.26x10 ⁻⁸	5.17x10 ⁻⁸	0.00	6.85x10 ⁻⁷	2.67x10 ⁻⁴	1.47x10 ⁻⁷
Camper 2 - Child	3.04x10 ⁻⁷	9.19x10 ⁻⁶	1.63x10 ⁻⁹	1.82x10 ⁻⁹	6.00x10 ⁻⁹	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.46x10 ⁻⁹	3.89x10 ⁻⁸	3.75x10 ⁻⁸	2.94x10 ⁻⁸	0.00	8.58x10 ⁻⁸	1.91x10 ⁻⁴	1.12x10 ⁻⁷
Camper 2 - Adult	2.65x10 ⁻⁷	5.28x10 ⁻⁶	1.02x10 ⁻⁹	1.14x10 ⁻⁹	3.77x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.17x10 ⁻⁹	2.45x10 ⁻⁸	2.36x10 ⁻⁸	1.26x10 ⁻⁸	9.02x10 ⁻⁹	3.99x10 ⁻⁸	1.20x10 ⁻⁴	8.55x10 ⁻⁸

Thallium mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	0.00	0.00	1.77x10 ⁻⁸	6.69x10 ⁻⁸	4.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.79x10 ⁻⁸	0.00	2.21x10 ⁻⁸	0.00	0.00	4.10x10 ⁻⁶	0.00
Camper 1 - Child	0.00	0.00	1.26x10 ⁻⁸	4.78x10 ⁻⁸	3.22x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.99x10 ⁻⁸	0.00	1.26x10 ⁻⁸	0.00	0.00	2.92x10 ⁻⁶	0.00
Camper 1 - Adult	0.00	0.00	7.94x10 ⁻⁹	3.00x10 ⁻⁸	2.03x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.39x10 ⁻⁸	0.00	5.36x10 ⁻⁹	1.62x10 ⁻⁷	0.00	2.00x10 ⁻⁶	0.00
Camper 2 - Toddler	0.00	0.00	3.55x10 ⁻⁹	5.71x10 ⁻⁹	3.41x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	7.47x10 ⁻⁸	0.00	2.32x10 ⁻⁸	0.00	0.00	4.00x10 ⁻⁶	0.00
Camper 2 - Child	0.00	0.00	2.53x10 ⁻⁹	4.08x10 ⁻⁹	2.43x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	5.33x10 ⁻⁸	0.00	1.32x10 ⁻⁸	0.00	0.00	2.85x10 ⁻⁶	0.00
Camper 2 - Adult	0.00	0.00	1.59x10 ⁻⁹	2.56x10 ⁻⁹	1.53x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	3.35x10 ⁻⁸	0.00	5.64x10 ⁻⁹	1.62x10 ⁻⁷	0.00	1.95x10 ⁻⁶	0.00

Tin mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	0.00	0.00	9.23x10 ⁻⁸	8.47x10 ⁻⁸	7.74x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	2.10x10 ⁻⁶	0.00	3.45x10 ⁻⁶	0.00	2.34x10 ⁻⁶	1.33x10 ⁻⁵	2.02x10 ⁻⁷
Camper 1 - Child	0.00	0.00	6.58x10 ⁻⁸	6.05x10 ⁻⁸	5.53x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	1.50x10 ⁻⁶	0.00	1.97x10 ⁻⁶	0.00	2.94x10 ⁻⁷	7.59x10 ⁻⁶	1.53x10 ⁻⁷
Camper 1 - Adult	0.00	0.00	4.14x10 ⁻⁸	3.80x10 ⁻⁸	3.48x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	9.42x10 ⁻⁷	0.00	8.39x10 ⁻⁷	1.80x10 ⁻⁷	1.37x10 ⁻⁷	4.51x10 ⁻⁶	1.17x10 ⁻⁷
Camper 2 - Toddler	0.00	0.00	1.26x10 ⁻⁷	2.05x10 ⁻⁷	7.17x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	2.21x10 ⁻⁶	0.00	1.92x10 ⁻⁷	0.00	1.52x10 ⁻⁶	9.44x10 ⁻⁶	1.31x10 ⁻⁷
Camper 2 - Child	0.00	0.00	8.99x10 ⁻⁸	1.47x10 ⁻⁷	5.12x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	1.58x10 ⁻⁶	0.00	1.09x10 ⁻⁷	0.00	1.90x10 ⁻⁷	5.82x10 ⁻⁶	9.91x10 ⁻⁸
Camper 2 - Adult	0.00	0.00	5.65x10 ⁻⁸	9.22x10 ⁻⁸	3.22x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	9.93x10 ⁻⁷	0.00	4.66x10 ⁻⁸	1.80x10 ⁻⁷	8.84x10 ⁻⁸	3.79x10 ⁻⁶	7.57x10 ⁻⁸

TABLE 4.5-1 (Cont'd)
HUMAN INTAKES OF COPC FOR “EXISTING” SCENARIO

Zinc mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	1.44x10 ⁻⁴	1.11x10 ⁻²	5.66x10 ⁻⁴	3.50x10 ⁻⁴	4.78x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	5.43x10 ⁻³	2.01x10 ⁻³	3.41x10 ⁻⁴	5.63x10 ⁻⁵	0.00	4.45x10 ⁻⁴	2.18x10 ⁻¹	7.67x10 ⁻⁶
Camper 1 - Child	9.61x10 ⁻⁵	9.02x10 ⁻³	4.04x10 ⁻⁴	2.50x10 ⁻⁴	3.41x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	3.88x10 ⁻³	1.43x10 ⁻³	2.43x10 ⁻⁴	3.20x10 ⁻⁵	0.00	5.58x10 ⁻⁵	1.56x10 ⁻¹	5.83x10 ⁻⁶
Camper 1 - Adult	8.38x10 ⁻⁵	5.18x10 ⁻³	2.54x10 ⁻⁴	1.57x10 ⁻⁴	2.14x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.44x10 ⁻³	9.01x10 ⁻⁴	1.53x10 ⁻⁴	1.37x10 ⁻⁵	3.88x10 ⁻⁵	2.60x10 ⁻⁵	9.79x10 ⁻²	4.45x10 ⁻⁶
Camper 2 - Toddler	3.80x10 ⁻⁵	2.94x10 ⁻³	1.97x10 ⁻⁴	9.73x10 ⁻⁵	2.83x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	5.43x10 ⁻³	7.36x10 ⁻⁴	9.01x10 ⁻⁵	2.96x10 ⁻⁵	0.00	9.68x10 ⁻⁵	2.07x10 ⁻¹	1.67x10 ⁻⁶
Camper 2 - Child	2.54x10 ⁻⁵	2.39x10 ⁻³	1.41x10 ⁻⁴	6.95x10 ⁻⁵	2.02x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	3.88x10 ⁻³	5.25x10 ⁻⁴	6.43x10 ⁻⁵	1.69x10 ⁻⁵	0.00	1.21x10 ⁻⁵	1.48x10 ⁻¹	1.27x10 ⁻⁶
Camper 2 - Adult	2.22x10 ⁻⁵	1.37x10 ⁻³	8.86x10 ⁻⁵	4.37x10 ⁻⁵	1.27x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.44x10 ⁻³	3.30x10 ⁻⁴	4.04x10 ⁻⁵	7.20x10 ⁻⁶	3.88x10 ⁻⁵	5.65x10 ⁻⁶	9.29x10 ⁻²	9.67x10 ⁻⁷

TABLE 4.5-2
PERCENTAGE BREAKDOWN BY PATHWAY FOR “EXISTING” SCENARIO

Percent Intake by Pathway														
Arsenic	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	13.44%	59.90%	0.07%	0.06%	0.04%	4.31%	2.44%	0.02%	1.48%	2.54%	0.42%	n/a	14.87%	0.41%
Camper 1 - Child	13.24%	71.69%	0.07%	0.07%	0.04%	4.53%	2.57%	0.02%	1.55%	2.67%	0.35%	n/a	2.75%	0.46%
Camper 1 - Adult	18.68%	66.60%	0.07%	0.07%	0.04%	4.61%	2.61%	0.02%	1.58%	2.71%	0.24%	0.13%	2.07%	0.57%
Camper 2 - Toddler	11.74%	52.34%	0.04%	0.03%	0.07%	15.97%	9.06%	0.08%	1.03%	2.22%	2.20%	n/a	5.09%	0.14%
Camper 2 - Child	10.80%	58.48%	0.04%	0.03%	0.07%	15.68%	8.89%	0.07%	1.01%	2.18%	1.72%	n/a	0.88%	0.15%
Camper 2 - Adult	15.16%	54.07%	0.04%	0.03%	0.07%	15.87%	9.00%	0.08%	1.03%	2.20%	1.18%	0.45%	0.66%	0.18%

Cadmium	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	2.72%	42.04%	0.02%	0.00%	0.21%	47.65%	1.55%	0.00%	1.59%	2.41%	0.59%	n/a	1.19%	0.03%
Camper 1 - Child	2.44%	45.77%	0.02%	0.00%	0.20%	45.57%	1.48%	0.00%	1.52%	2.30%	0.45%	n/a	0.20%	0.03%
Camper 1 - Adult	3.49%	43.17%	0.02%	0.00%	0.21%	47.05%	1.53%	0.00%	1.57%	2.38%	0.32%	0.06%	0.15%	0.04%
Camper 2 - Toddler	2.49%	38.53%	0.02%	0.00%	0.17%	51.07%	1.66%	0.00%	1.92%	2.21%	0.24%	n/a	1.64%	0.05%
Camper 2 - Child	2.25%	42.27%	0.02%	0.00%	0.17%	49.21%	1.60%	0.00%	1.85%	2.13%	0.18%	n/a	0.28%	0.05%
Camper 2 - Adult	3.21%	39.74%	0.02%	0.00%	0.17%	50.65%	1.65%	0.00%	1.90%	2.19%	0.13%	0.07%	0.21%	0.06%

Copper	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.60%	29.35%	0.02%	0.03%	0.05%	59.26%	9.41%	0.03%	0.05%	0.05%	0.38%	n/a	0.71%	0.06%
Camper 1 - Child	0.54%	32.33%	0.02%	0.03%	0.05%	57.33%	9.10%	0.03%	0.05%	0.05%	0.29%	n/a	0.12%	0.06%
Camper 1 - Adult	0.77%	30.27%	0.02%	0.03%	0.05%	58.76%	9.33%	0.03%	0.05%	0.05%	0.20%	0.26%	0.09%	0.08%
Camper 2 - Toddler	0.50%	24.44%	0.01%	0.02%	0.04%	64.28%	10.21%	0.04%	0.03%	0.04%	0.19%	n/a	0.19%	0.02%
Camper 2 - Child	0.45%	26.97%	0.01%	0.02%	0.04%	62.32%	9.90%	0.03%	0.02%	0.04%	0.14%	n/a	0.03%	0.02%
Camper 2 - Adult	0.64%	25.12%	0.01%	0.02%	0.04%	63.54%	10.09%	0.04%	0.02%	0.04%	0.10%	0.28%	0.02%	0.02%

Lead	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	1.01%	4.92%	17.87%	20.43%	0.06%	3.24%	0.46%	0.00%	0.89%	0.01%	0.31%	n/a	50.52%	0.26%
Camper 1 - Child	1.60%	9.51%	30.33%	34.68%	0.11%	5.50%	0.78%	0.00%	1.52%	0.02%	0.43%	n/a	15.06%	0.47%
Camper 1 - Adult	2.30%	8.98%	31.38%	35.88%	0.11%	5.70%	0.81%	0.00%	1.57%	0.02%	0.30%	0.83%	11.53%	0.59%
Camper 2 - Toddler	11.71%	57.24%	0.73%	0.67%	0.53%	21.55%	3.05%	0.01%	0.04%	0.11%	0.13%	n/a	4.22%	0.02%
Camper 2 - Child	10.58%	62.85%	0.70%	0.64%	0.51%	20.78%	2.95%	0.01%	0.04%	0.10%	0.10%	n/a	0.71%	0.02%
Camper 2 - Adult	14.46%	56.57%	0.69%	0.63%	0.50%	20.48%	2.90%	0.01%	0.04%	0.10%	0.07%	3.00%	0.52%	0.03%

Manganese	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	5.43%	76.48%	0.02%	0.04%	0.05%	6.06%	1.67%	0.07%	0.05%	0.04%	6.36%	n/a	3.44%	0.30%
Camper 1 - Child	4.79%	82.03%	0.02%	0.04%	0.04%	5.71%	1.58%	0.07%	0.05%	0.03%	4.78%	n/a	0.57%	0.30%
Camper 1 - Adult	6.23%	70.19%	0.02%	0.04%	0.04%	5.34%	1.48%	0.07%	0.04%	0.03%	3.04%	12.76%	0.39%	0.34%
Camper 2 - Toddler	2.33%	32.87%	0.15%	0.20%	0.15%	20.91%	5.78%	0.26%	0.63%	0.02%	12.56%	n/a	22.22%	1.91%
Camper 2 - Child	2.61%	44.72%	0.18%	0.24%	0.18%	24.99%	6.91%	0.31%	0.76%	0.02%	11.98%	n/a	4.67%	2.43%
Camper 2 - Adult	2.38%	26.83%	0.12%	0.16%	0.12%	16.41%	4.54%	0.20%	0.50%	0.01%	5.34%	39.18%	2.27%	1.94%

TABLE 4.5-2 (Cont'd)
PERCENTAGE BREAKDOWN BY PATHWAY FOR “EXISTING” SCENARIO

Nickel	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	17.11%	59.05%	0.13%	0.11%	0.35%	9.56%	1.52%	0.23%	3.09%	1.42%	2.58%	n/a	3.72%	1.12%
Camper 1 - Child	15.48%	64.91%	0.13%	0.11%	0.33%	9.23%	1.47%	0.23%	2.98%	1.37%	1.99%	n/a	0.63%	1.15%
Camper 1 - Adult	21.27%	58.72%	0.13%	0.11%	0.33%	9.14%	1.45%	0.22%	2.95%	1.36%	1.34%	1.13%	0.46%	1.39%
Camper 2 - Toddler	8.58%	29.60%	0.31%	0.20%	0.45%	33.65%	5.35%	0.83%	7.84%	0.71%	2.55%	n/a	7.63%	2.30%
Camper 2 - Child	8.29%	34.78%	0.32%	0.21%	0.47%	34.72%	5.52%	0.85%	8.09%	0.74%	2.10%	n/a	1.38%	2.53%
Camper 2 - Adult	11.06%	30.55%	0.31%	0.20%	0.45%	33.38%	5.30%	0.82%	7.78%	0.71%	1.37%	4.14%	0.98%	2.95%

Silver	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.27%	6.70%	0.00%	0.00%	0.01%	89.60%	3.03%	0.00%	0.06%	0.03%	0.04%	n/a	0.22%	0.05%
Camper 1 - Child	0.25%	7.57%	0.00%	0.00%	0.01%	88.96%	3.00%	0.00%	0.06%	0.03%	0.03%	n/a	0.04%	0.05%
Camper 1 - Adult	0.35%	6.96%	0.00%	0.00%	0.01%	89.46%	3.02%	0.00%	0.06%	0.03%	0.02%	0.01%	0.03%	0.06%
Camper 2 - Toddler	0.17%	4.24%	0.00%	0.00%	0.00%	92.11%	3.11%	0.00%	0.02%	0.02%	0.02%	n/a	0.26%	0.06%
Camper 2 - Child	0.16%	4.80%	0.00%	0.00%	0.00%	91.77%	3.10%	0.00%	0.02%	0.02%	0.02%	n/a	0.04%	0.06%
Camper 2 - Adult	0.22%	4.40%	0.00%	0.00%	0.00%	92.10%	3.11%	0.00%	0.02%	0.02%	0.01%	0.01%	0.03%	0.07%

Thallium	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	n/a	n/a	0.43%	1.63%	0.11%	86.98%	6.91%	1.01%	2.39%	n/a	0.54%	n/a	n/a	n/a
Camper 1 - Child	n/a	n/a	0.43%	1.63%	0.11%	87.08%	6.92%	1.01%	2.39%	n/a	0.43%	n/a	n/a	n/a
Camper 1 - Adult	n/a	n/a	0.40%	1.50%	0.10%	80.11%	6.36%	0.93%	2.20%	n/a	0.27%	8.12%	n/a	n/a
Camper 2 - Toddler	n/a	n/a	0.09%	0.14%	0.09%	89.13%	7.08%	1.03%	1.87%	n/a	0.58%	n/a	n/a	n/a
Camper 2 - Child	n/a	n/a	0.09%	0.14%	0.09%	89.23%	7.09%	1.03%	1.87%	n/a	0.46%	n/a	n/a	n/a
Camper 2 - Adult	n/a	n/a	0.08%	0.13%	0.08%	81.94%	6.51%	0.95%	1.72%	n/a	0.29%	8.31%	n/a	n/a

Tin	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	n/a	n/a	0.69%	0.63%	0.58%	26.48%	8.41%	3.11%	15.59%	n/a	25.63%	n/a	17.39%	1.50%
Camper 1 - Child	n/a	n/a	0.85%	0.78%	0.71%	32.86%	10.44%	3.86%	19.34%	n/a	25.38%	n/a	3.79%	1.98%
Camper 1 - Adult	n/a	n/a	0.89%	0.82%	0.75%	34.59%	10.99%	4.06%	20.36%	n/a	18.14%	3.90%	2.95%	2.53%
Camper 2 - Toddler	n/a	n/a	1.32%	2.15%	0.75%	37.26%	11.84%	4.37%	23.12%	n/a	2.00%	n/a	15.83%	1.36%
Camper 2 - Child	n/a	n/a	1.52%	2.48%	0.87%	43.01%	13.67%	5.05%	26.69%	n/a	1.85%	n/a	3.21%	1.67%
Camper 2 - Adult	n/a	n/a	1.46%	2.39%	0.83%	41.44%	13.17%	4.86%	25.72%	n/a	1.21%	4.67%	2.29%	1.96%

Zinc	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.07%	5.10%	0.26%	0.16%	0.22%	84.12%	6.27%	2.49%	0.92%	0.16%	0.03%	n/a	0.20%	0.004%
Camper 1 - Child	0.06%	5.77%	0.26%	0.16%	0.22%	83.68%	6.23%	2.48%	0.92%	0.16%	0.02%	n/a	0.04%	0.004%
Camper 1 - Adult	0.09%	5.30%	0.26%	0.16%	0.22%	84.06%	6.26%	2.49%	0.92%	0.16%	0.01%	0.04%	0.03%	0.005%
Camper 2 - Toddler	0.02%	1.42%	0.10%	0.05%	0.14%	88.60%	6.60%	2.63%	0.36%	0.04%	0.01%	n/a	0.05%	0.001%
Camper 2 - Child	0.02%	1.61%	0.10%	0.05%	0.14%	88.46%	6.59%	2.62%	0.36%	0.04%	0.01%	n/a	0.01%	0.001%
Camper 2 - Adult	0.02%	1.48%	0.10%	0.05%	0.14%	88.54%	6.60%	2.62%	0.36%	0.04%	0.01%	0.04%	0.01%	0.001%

4.5.2 “No Intervention” Scenario

The predicted intakes for the various receptors for the “No Intervention” Future 1 scenario are provided on Table 4.5-3. Camper 1 and Camper 2 were considered in this assessment, as it was assumed that if no remediation occurred on the site, the activity patterns would be similar to those that are currently occurring on site. In addition, it has been assumed that the COPC concentrations in the terrestrial environment do not change from what are currently being measured and therefore only the COPC concentrations in water change as time progresses in this scenario. As seen from the table, the ingestion intakes for the “No Intervention” Future 1 scenario are lower than the “Existing” scenario with the exception of zinc. This is due to lower predicted concentrations of COPC in the Pelly River since the aquatic pathways (in particular fish consumption) dominate the exposure. Thallium and tin intakes have not changed from the “Existing” scenario, as there were no measured water concentrations available to predict into the future.

Table 4.5-4 provides the percentage breakdown by pathway. Consumption of fish and moose are the greatest exposure pathways for all COPC excepting lead for Camper 1 toddler in this scenario. Soil ingestion by the toddler is still the dominant pathway of exposure to lead. It should be noted that even though Camper 2 is considered to be off site in a background area, it has been assumed that moose and caribou would be hunted on the Anvil Mine Complex.

TABLE 4.5-3
HUMAN INTAKES OF COPC FOR “NO INTERVENTION” SCENARIO – FUTURE 1

Intake by Pathway															
Arsenic mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	3.24x10 ⁻⁶	1.44x10 ⁻⁵	5.68x10 ⁻⁸	5.32x10 ⁻⁸	1.71x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.68x10 ⁻⁸	1.23x10 ⁻⁶	6.12x10 ⁻⁷	3.46x10 ⁻⁷	0.00	1.23x10 ⁻⁵	3.79x10 ⁻⁵	3.39x10 ⁻⁷
Camper 1 - Child	2.17x10 ⁻⁶	1.17x10 ⁻⁵	4.05x10 ⁻⁸	3.80x10 ⁻⁸	1.22x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.20x10 ⁻⁸	8.76x10 ⁻⁷	4.37x10 ⁻⁷	1.97x10 ⁻⁷	0.00	1.54x10 ⁻⁶	2.10x10 ⁻⁵	2.58x10 ⁻⁷
Camper 1 - Adult	1.89x10 ⁻⁶	6.74x10 ⁻⁶	2.55x10 ⁻⁸	2.39x10 ⁻⁸	7.69x10 ⁻⁹	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.56x10 ⁻⁹	5.51x10 ⁻⁷	2.75x10 ⁻⁷	8.41x10 ⁻⁸	4.51x10 ⁻⁸	7.18x10 ⁻⁷	1.29x10 ⁻⁵	1.97x10 ⁻⁷
Camper 2 - Toddler	2.62x10 ⁻⁶	1.17x10 ⁻⁵	9.23x10 ⁻⁹	6.22x10 ⁻⁹	1.50x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.68x10 ⁻⁸	2.31x10 ⁻⁷	4.95x10 ⁻⁷	4.91x10 ⁻⁷	0.00	1.14x10 ⁻⁶	2.23x10 ⁻⁵	3.13x10 ⁻⁸
Camper 2 - Child	1.75x10 ⁻⁶	9.49x10 ⁻⁶	6.59x10 ⁻⁹	4.44x10 ⁻⁹	1.07x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.20x10 ⁻⁸	1.65x10 ⁻⁷	3.53x10 ⁻⁷	2.80x10 ⁻⁷	0.00	1.43x10 ⁻⁷	1.62x10 ⁻⁵	2.38x10 ⁻⁸
Camper 2 - Adult	1.53x10 ⁻⁶	5.45x10 ⁻⁶	4.14x10 ⁻⁹	2.79x10 ⁻⁹	6.73x10 ⁻⁹	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.56x10 ⁻⁹	1.04x10 ⁻⁷	2.22x10 ⁻⁷	1.19x10 ⁻⁷	4.51x10 ⁻⁸	6.63x10 ⁻⁸	1.01x10 ⁻⁵	1.82x10 ⁻⁸

Cadmium mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	2.64x10 ⁻⁶	4.08x10 ⁻⁵	1.76x10 ⁻⁸	3.04x10 ⁻⁹	2.07x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.85x10 ⁻⁹	1.56x10 ⁻⁶	2.34x10 ⁻⁶	5.78x10 ⁻⁷	0.00	1.16x10 ⁻⁶	9.74x10 ⁻⁵	3.20x10 ⁻⁸
Camper 1 - Child	1.77x10 ⁻⁶	3.32x10 ⁻⁵	1.26x10 ⁻⁸	2.17x10 ⁻⁹	1.48x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.32x10 ⁻⁹	1.11x10 ⁻⁶	1.67x10 ⁻⁶	3.29x10 ⁻⁷	0.00	1.45x10 ⁻⁷	7.27x10 ⁻⁵	2.43x10 ⁻⁸
Camper 1 - Adult	1.54x10 ⁻⁶	1.90x10 ⁻⁵	7.92x10 ⁻⁹	1.37x10 ⁻⁹	9.29x10 ⁻⁸	2.09x10 ⁻⁵	6.81x10 ⁻⁷	8.32x10 ⁻¹⁰	7.00x10 ⁻⁷	1.05x10 ⁻⁶	1.40x10 ⁻⁷	2.71x10 ⁻⁸	6.76x10 ⁻⁸	4.43x10 ⁻⁵	1.85x10 ⁻⁸
Camper 2 - Toddler	2.27x10 ⁻⁶	3.51x10 ⁻⁵	1.99x10 ⁻⁸	4.20x10 ⁻⁹	1.57x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.85x10 ⁻⁹	1.75x10 ⁻⁶	2.01x10 ⁻⁶	2.18x10 ⁻⁷	0.00	1.50x10 ⁻⁶	9.11x10 ⁻⁵	4.12x10 ⁻⁸
Camper 2 - Child	1.52x10 ⁻⁶	2.85x10 ⁻⁵	1.42x10 ⁻⁸	3.00x10 ⁻⁹	1.12x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.32x10 ⁻⁹	1.25x10 ⁻⁶	1.44x10 ⁻⁶	1.24x10 ⁻⁷	0.00	1.87x10 ⁻⁷	6.75x10 ⁻⁵	3.13x10 ⁻⁸
Camper 2 - Adult	1.33x10 ⁻⁶	1.64x10 ⁻⁵	8.95x10 ⁻⁹	1.88x10 ⁻⁹	7.07x10 ⁻⁸	2.09x10 ⁻⁵	6.81x10 ⁻⁷	8.32x10 ⁻¹⁰	7.84x10 ⁻⁷	9.03x10 ⁻⁷	5.30x10 ⁻⁸	2.71x10 ⁻⁸	8.72x10 ⁻⁸	4.12x10 ⁻⁵	2.39x10 ⁻⁸

Copper mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	3.39x10 ⁻⁵	1.66x10 ⁻³	1.19x10 ⁻⁶	1.45x10 ⁻⁶	2.99x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.66x10 ⁻⁶	2.37x10 ⁻⁶	2.71x10 ⁻⁶	1.85x10 ⁻⁵	0.00	3.49x10 ⁻⁵	5.15x10 ⁻³	3.00x10 ⁻⁶
Camper 1 - Child	2.27x10 ⁻⁵	1.35x10 ⁻³	8.51x10 ⁻⁷	1.03x10 ⁻⁶	2.13x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.19x10 ⁻⁶	1.69x10 ⁻⁶	1.93x10 ⁻⁶	1.05x10 ⁻⁵	0.00	4.37x10 ⁻⁶	3.81x10 ⁻³	2.28x10 ⁻⁶
Camper 1 - Adult	1.98x10 ⁻⁵	7.76x10 ⁻⁴	5.35x10 ⁻⁷	6.50x10 ⁻⁷	1.34x10 ⁻⁶	1.31x10 ⁻³	2.08x10 ⁻⁴	7.45x10 ⁻⁷	1.07x10 ⁻⁶	1.21x10 ⁻⁶	4.50x10 ⁻⁶	5.86x10 ⁻⁶	2.03x10 ⁻⁶	2.33x10 ⁻³	1.74x10 ⁻⁶
Camper 2 - Toddler	2.27x10 ⁻⁵	1.11x10 ⁻³	5.80x10 ⁻⁷	9.47x10 ⁻⁷	1.96x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.66x10 ⁻⁶	1.14x10 ⁻⁶	1.81x10 ⁻⁶	8.46x10 ⁻⁶	0.00	8.76x10 ⁻⁶	4.54x10 ⁻³	7.55x10 ⁻⁷
Camper 2 - Child	1.51x10 ⁻⁵	9.02x10 ⁻⁴	4.14x10 ⁻⁷	6.76x10 ⁻⁷	1.40x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.19x10 ⁻⁶	8.11x10 ⁻⁷	1.29x10 ⁻⁶	4.82x10 ⁻⁶	0.00	1.10x10 ⁻⁶	3.35x10 ⁻³	5.73x10 ⁻⁷
Camper 2 - Adult	1.32x10 ⁻⁵	5.18x10 ⁻⁴	2.60x10 ⁻⁷	4.25x10 ⁻⁷	8.80x10 ⁻⁷	1.31x10 ⁻³	2.08x10 ⁻⁴	7.45x10 ⁻⁷	5.10x10 ⁻⁷	8.12x10 ⁻⁷	2.06x10 ⁻⁶	5.86x10 ⁻⁶	5.11x10 ⁻⁷	2.06x10 ⁻³	4.38x10 ⁻⁷

Lead mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	1.93x10 ⁻⁵	9.42x10 ⁻⁵	1.96x10 ⁻⁴	2.25x10 ⁻⁴	1.06x10 ⁻⁶	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.25x10 ⁻⁸	9.81x10 ⁻⁶	1.74x10 ⁻⁷	3.45x10 ⁻⁶	0.00	5.55x10 ⁻⁴	1.15x10 ⁻³	2.87x10 ⁻⁶
Camper 1 - Child	1.29x10 ⁻⁵	7.66x10 ⁻⁵	1.40x10 ⁻⁴	1.60x10 ⁻⁴	7.54x10 ⁻⁷	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.91x10 ⁻⁹	7.00x10 ⁻⁶	1.24x10 ⁻⁷	1.96x10 ⁻⁶	0.00	6.96x10 ⁻⁵	4.99x10 ⁻⁴	2.18x10 ⁻⁶
Camper 1 - Adult	1.12x10 ⁻⁵	4.40x10 ⁻⁵	8.82x10 ⁻⁵	1.01x10 ⁻⁴	4.74x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.60x10 ⁻⁹	4.40x10 ⁻⁶	7.81x10 ⁻⁸	8.39x10 ⁻⁷	2.34x10 ⁻⁶	3.24x10 ⁻⁵	3.03x10 ⁻⁴	1.66x10 ⁻⁶
Camper 2 - Toddler	1.94x10 ⁻⁵	9.47x10 ⁻⁵	1.21x10 ⁻⁶	1.10x10 ⁻⁶	8.70x10 ⁻⁷	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.25x10 ⁻⁸	6.72x10 ⁻⁸	1.75x10 ⁻⁷	2.21x10 ⁻⁷	0.00	6.98x10 ⁻⁶	1.65x10 ⁻⁴	3.61x10 ⁻⁸
Camper 2 - Child	1.30x10 ⁻⁵	7.70x10 ⁻⁵	8.62x10 ⁻⁷	7.88x10 ⁻⁷	6.21x10 ⁻⁷	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.91x10 ⁻⁹	4.80x10 ⁻⁸	1.25x10 ⁻⁷	1.26x10 ⁻⁷	0.00	8.75x10 ⁻⁷	1.22x10 ⁻⁴	2.74x10 ⁻⁸
Camper 2 - Adult	1.13x10 ⁻⁵	4.42x10 ⁻⁵	5.42x10 ⁻⁷	4.96x10 ⁻⁷	3.91x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.60x10 ⁻⁹	3.02x10 ⁻⁸	7.85x10 ⁻⁸	5.38x10 ⁻⁸	2.34x10 ⁻⁶	4.07x10 ⁻⁷	7.81x10 ⁻⁵	2.09x10 ⁻⁸

TABLE 4.5-3 (Cont'd)
HUMAN INTAKES OF COPC FOR “NO INTERVENTION” SCENARIO – FUTURE 1

Manganese mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	1.14x10 ⁻⁴	1.61x10 ⁻³	1.62x10 ⁻⁶	3.83x10 ⁻⁶	3.83x10 ⁻⁶	5.71x10 ⁻⁷	1.58x10 ⁻⁴	7.09x10 ⁻⁶	4.78x10 ⁻⁶	7.40x10 ⁻⁷	5.99x10 ⁻⁴	0.00	3.24x10 ⁻⁴	3.40x10 ⁻³	2.79x10 ⁻⁵
Camper 1 - Child	7.65x10 ⁻⁵	1.31x10 ⁻³	1.16x10 ⁻⁶	2.73x10 ⁻⁶	2.73x10 ⁻⁶	4.07x10 ⁻⁷	1.13x10 ⁻⁴	5.06x10 ⁻⁶	3.41x10 ⁻⁶	5.28x10 ⁻⁷	3.41x10 ⁻⁴	0.00	4.06x10 ⁻⁵	2.30x10 ⁻³	2.12x10 ⁻⁵
Camper 1 - Adult	6.67x10 ⁻⁵	7.52x10 ⁻⁴	7.27x10 ⁻⁷	1.72x10 ⁻⁶	1.72x10 ⁻⁶	2.56x10 ⁻⁷	7.08x10 ⁻⁵	3.18x10 ⁻⁶	2.14x10 ⁻⁶	3.32x10 ⁻⁷	1.46x10 ⁻⁴	6.11x10 ⁻⁴	1.89x10 ⁻⁵	1.93x10 ⁻³	1.62x10 ⁻⁵
Camper 2 - Toddler	6.36x10 ⁻⁵	8.97x10 ⁻⁴	4.10x10 ⁻⁶	5.53x10 ⁻⁶	4.06x10 ⁻⁶	5.71x10 ⁻⁷	1.58x10 ⁻⁴	7.09x10 ⁻⁶	1.73x10 ⁻⁵	4.12x10 ⁻⁷	3.43x10 ⁻⁴	0.00	6.06x10 ⁻⁴	2.68x10 ⁻³	5.22x10 ⁻⁵
Camper 2 - Child	4.26x10 ⁻⁵	7.29x10 ⁻⁴	2.93x10 ⁻⁶	3.95x10 ⁻⁶	2.90x10 ⁻⁶	4.07x10 ⁻⁷	1.13x10 ⁻⁴	5.06x10 ⁻⁶	1.23x10 ⁻⁵	2.94x10 ⁻⁷	1.95x10 ⁻⁴	0.00	7.60x10 ⁻⁵	1.59x10 ⁻³	3.97x10 ⁻⁵
Camper 2 - Adult	3.71x10 ⁻⁵	4.19x10 ⁻⁴	1.84x10 ⁻⁶	2.48x10 ⁻⁶	1.82x10 ⁻⁶	2.56x10 ⁻⁷	7.08x10 ⁻⁵	3.18x10 ⁻⁶	7.76x10 ⁻⁶	1.85x10 ⁻⁷	8.33x10 ⁻⁵	6.11x10 ⁻⁴	3.54x10 ⁻⁵	1.53x10 ⁻³	3.03x10 ⁻⁵

Nickel mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	5.35x10 ⁻⁶	1.85x10 ⁻⁵	2.44x10 ⁻⁷	2.09x10 ⁻⁷	3.16x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.46x10 ⁻⁷	5.76x10 ⁻⁶	4.44x10 ⁻⁷	4.82x10 ⁻⁶	0.00	6.94x10 ⁻⁶	6.37x10 ⁻⁵	2.09x10 ⁻⁶
Camper 1 - Child	3.58x10 ⁻⁶	1.50x10 ⁻⁵	1.74x10 ⁻⁷	1.49x10 ⁻⁷	2.25x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.18x10 ⁻⁷	4.11x10 ⁻⁶	3.17x10 ⁻⁷	2.74x10 ⁻⁶	0.00	8.70x10 ⁻⁷	4.22x10 ⁻⁵	1.59x10 ⁻⁶
Camper 1 - Adult	3.12x10 ⁻⁶	8.62x10 ⁻⁶	1.10x10 ⁻⁷	9.36x10 ⁻⁸	1.42x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	2.00x10 ⁻⁷	2.59x10 ⁻⁶	1.99x10 ⁻⁷	1.17x10 ⁻⁶	9.92x10 ⁻⁷	4.05x10 ⁻⁷	2.69x10 ⁻⁵	1.21x10 ⁻⁶
Camper 2 - Toddler	4.55x10 ⁻⁶	1.57x10 ⁻⁵	1.64x10 ⁻⁷	1.07x10 ⁻⁷	2.39x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.46x10 ⁻⁷	4.15x10 ⁻⁶	3.78x10 ⁻⁷	1.35x10 ⁻⁶	0.00	4.04x10 ⁻⁶	5.18x10 ⁻⁵	1.22x10 ⁻⁶
Camper 2 - Child	3.04x10 ⁻⁶	1.27x10 ⁻⁵	1.17x10 ⁻⁷	7.66x10 ⁻⁸	1.71x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.18x10 ⁻⁷	2.96x10 ⁻⁶	2.69x10 ⁻⁷	7.70x10 ⁻⁷	0.00	5.07x10 ⁻⁷	3.57x10 ⁻⁵	9.26x10 ⁻⁷
Camper 2 - Adult	2.65x10 ⁻⁶	7.32x10 ⁻⁶	7.38x10 ⁻⁸	4.82x10 ⁻⁸	1.07x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	2.00x10 ⁻⁷	1.86x10 ⁻⁶	1.69x10 ⁻⁷	3.29x10 ⁻⁷	9.92x10 ⁻⁷	2.36x10 ⁻⁷	2.33x10 ⁻⁵	7.07x10 ⁻⁷

Silver mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	3.17x10 ⁻⁸	7.89x10 ⁻⁷	6.12x10 ⁻⁹	6.19x10 ⁻⁹	3.14x10 ⁻⁹	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.88x10 ⁻⁹	1.58x10 ⁻⁷	3.67x10 ⁻⁹	9.93x10 ⁻⁸	0.00	6.06x10 ⁻⁷	2.56x10 ⁻⁴	1.31x10 ⁻⁷
Camper 1 - Child	2.12x10 ⁻⁸	6.41x10 ⁻⁷	4.37x10 ⁻⁹	4.42x10 ⁻⁹	2.24x10 ⁻⁹	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.48x10 ⁻⁹	1.13x10 ⁻⁷	2.62x10 ⁻⁹	5.66x10 ⁻⁸	0.00	7.60x10 ⁻⁸	1.82x10 ⁻⁴	9.91x10 ⁻⁸
Camper 1 - Adult	1.85x10 ⁻⁸	3.68x10 ⁻⁷	2.75x10 ⁻⁹	2.78x10 ⁻⁹	1.41x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.19x10 ⁻⁹	7.09x10 ⁻⁸	1.65x10 ⁻⁹	2.41x10 ⁻⁸	9.02x10 ⁻⁹	3.54x10 ⁻⁸	1.15x10 ⁻⁴	7.57x10 ⁻⁸
Camper 2 - Toddler	4.55x10 ⁻⁷	1.13x10 ⁻⁵	2.28x10 ⁻⁹	2.54x10 ⁻⁹	8.40x10 ⁻⁹	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.88x10 ⁻⁹	5.46x10 ⁻⁸	5.26x10 ⁻⁸	5.17x10 ⁻⁸	0.00	6.85x10 ⁻⁷	2.67x10 ⁻⁴	1.47x10 ⁻⁷
Camper 2 - Child	3.04x10 ⁻⁷	9.19x10 ⁻⁶	1.63x10 ⁻⁹	1.82x10 ⁻⁹	6.00x10 ⁻⁹	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.48x10 ⁻⁹	3.89x10 ⁻⁸	3.75x10 ⁻⁸	2.94x10 ⁻⁸	0.00	8.58x10 ⁻⁸	1.91x10 ⁻⁴	1.12x10 ⁻⁷
Camper 2 - Adult	2.65x10 ⁻⁷	5.28x10 ⁻⁶	1.02x10 ⁻⁹	1.14x10 ⁻⁹	3.77x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.19x10 ⁻⁹	2.45x10 ⁻⁸	2.36x10 ⁻⁸	1.26x10 ⁻⁸	9.02x10 ⁻⁹	3.99x10 ⁻⁸	1.20x10 ⁻⁴	8.55x10 ⁻⁸

Thallium mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	0.00	0.00	1.77x10 ⁻⁸	6.69x10 ⁻⁸	4.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.79x10 ⁻⁸	0.00	2.21x10 ⁻⁸	0.00	0.00	4.10x10 ⁻⁶	0.00
Camper 1 - Child	0.00	0.00	1.26x10 ⁻⁸	4.78x10 ⁻⁸	3.22x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.99x10 ⁻⁸	0.00	1.26x10 ⁻⁸	0.00	0.00	2.92x10 ⁻⁶	0.00
Camper 1 - Adult	0.00	0.00	7.94x10 ⁻⁹	3.00x10 ⁻⁸	2.03x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.39x10 ⁻⁸	0.00	5.36x10 ⁻⁹	1.62x10 ⁻⁷	0.00	2.00x10 ⁻⁶	0.00
Camper 2 - Toddler	0.00	0.00	3.55x10 ⁻⁹	5.71x10 ⁻⁹	3.41x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	7.47x10 ⁻⁸	0.00	2.32x10 ⁻⁸	0.00	0.00	4.00x10 ⁻⁶	0.00
Camper 2 - Child	0.00	0.00	2.53x10 ⁻⁹	4.08x10 ⁻⁹	2.43x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	5.33x10 ⁻⁸	0.00	1.32x10 ⁻⁸	0.00	0.00	2.85x10 ⁻⁶	0.00
Camper 2 - Adult	0.00	0.00	1.59x10 ⁻⁹	2.56x10 ⁻⁹	1.53x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	3.35x10 ⁻⁸	0.00	5.64x10 ⁻⁹	1.62x10 ⁻⁷	0.00	1.95x10 ⁻⁶	0.00

TABLE 4.5-3 (Cont'd)
HUMAN INTAKES OF COPC FOR “NO INTERVENTION” SCENARIO – FUTURE 1

Tin mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	0.00	0.00	9.23x10 ⁻⁸	8.47x10 ⁻⁸	7.74x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	2.10x10 ⁻⁶	0.00	3.45x10 ⁻⁶	0.00	2.34x10 ⁻⁶	1.33x10 ⁻⁵	2.02x10 ⁻⁷
Camper 1 - Child	0.00	0.00	6.58x10 ⁻⁸	6.05x10 ⁻⁸	5.53x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	1.50x10 ⁻⁶	0.00	1.97x10 ⁻⁶	0.00	2.94x10 ⁻⁷	7.59x10 ⁻⁶	1.53x10 ⁻⁷
Camper 1 - Adult	0.00	0.00	4.14x10 ⁻⁸	3.80x10 ⁻⁸	3.48x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	9.42x10 ⁻⁷	0.00	8.39x10 ⁻⁷	1.80x10 ⁻⁷	1.37x10 ⁻⁷	4.51x10 ⁻⁶	1.17x10 ⁻⁷
Camper 2 - Toddler	0.00	0.00	1.26x10 ⁻⁷	2.05x10 ⁻⁷	7.17x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	2.21x10 ⁻⁶	0.00	1.92x10 ⁻⁷	0.00	1.52x10 ⁻⁶	9.44x10 ⁻⁶	1.31x10 ⁻⁷
Camper 2 - Child	0.00	0.00	8.99x10 ⁻⁸	1.47x10 ⁻⁷	5.12x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	1.58x10 ⁻⁶	0.00	1.09x10 ⁻⁷	0.00	1.90x10 ⁻⁷	5.82x10 ⁻⁶	9.91x10 ⁻⁸
Camper 2 - Adult	0.00	0.00	5.65x10 ⁻⁸	9.22x10 ⁻⁸	3.22x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	9.93x10 ⁻⁷	0.00	4.66x10 ⁻⁸	1.80x10 ⁻⁷	8.84x10 ⁻⁸	3.79x10 ⁻⁶	7.57x10 ⁻⁸

Zinc mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	3.36x10 ⁻⁴	2.60x10 ⁻²	5.72x10 ⁻⁴	3.60x10 ⁻⁴	6.40x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	6.56x10 ⁻³	2.02x10 ⁻³	7.97x10 ⁻⁴	5.63x10 ⁻⁵	0.00	4.45x10 ⁻⁴	2.35x10 ⁻¹	7.67x10 ⁻⁶
Camper 1 - Child	2.25x10 ⁻⁴	2.11x10 ⁻²	4.08x10 ⁻⁴	2.57x10 ⁻⁴	4.57x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	4.68x10 ⁻³	1.44x10 ⁻³	5.69x10 ⁻⁴	3.20x10 ⁻⁵	0.00	5.58x10 ⁻⁵	1.70x10 ⁻¹	5.83x10 ⁻⁶
Camper 1 - Adult	1.96x10 ⁻⁴	1.21x10 ⁻²	2.57x10 ⁻⁴	1.61x10 ⁻⁴	2.87x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.94x10 ⁻³	9.06x10 ⁻⁴	3.58x10 ⁻⁴	1.37x10 ⁻⁵	3.88x10 ⁻⁵	2.60x10 ⁻⁵	1.06x10 ⁻¹	4.45x10 ⁻⁶
Camper 2 - Toddler	3.80x10 ⁻⁵	2.94x10 ⁻³	1.97x10 ⁻⁴	9.73x10 ⁻⁵	2.83x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	6.56x10 ⁻³	7.36x10 ⁻⁴	9.01x10 ⁻⁴	2.96x10 ⁻⁵	0.00	9.68x10 ⁻⁵	2.08x10 ⁻¹	1.67x10 ⁻⁶
Camper 2 - Child	2.54x10 ⁻⁵	2.39x10 ⁻³	1.41x10 ⁻⁴	6.95x10 ⁻⁵	2.02x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	4.68x10 ⁻³	5.25x10 ⁻⁴	6.43x10 ⁻⁴	1.69x10 ⁻⁵	0.00	1.21x10 ⁻⁵	1.49x10 ⁻¹	1.27x10 ⁻⁶
Camper 2 - Adult	2.22x10 ⁻⁵	1.37x10 ⁻³	8.86x10 ⁻⁵	4.37x10 ⁻⁵	1.27x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.94x10 ⁻³	3.30x10 ⁻⁴	4.04x10 ⁻⁴	7.20x10 ⁻⁶	3.88x10 ⁻⁵	5.65x10 ⁻⁶	9.34x10 ⁻²	9.67x10 ⁻⁷

TABLE 4.5-4
PERCENTAGE BREAKDOWN BY PATHWAY FOR
“NO INTERVENTION” SCENARIO – FUTURE 1

Percent Intake by Pathway														
Arsenic	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	8.47%	37.77%	0.15%	0.14%	0.04%	9.32%	5.29%	0.04%	3.21%	1.60%	0.90%	n/a	32.17%	0.89%
Camper 1 - Child	10.17%	55.09%	0.19%	0.18%	0.06%	11.95%	6.77%	0.06%	4.11%	2.05%	0.92%	n/a	7.24%	1.21%
Camper 1 - Adult	14.46%	51.57%	0.19%	0.18%	0.06%	12.24%	6.94%	0.06%	4.21%	2.10%	0.64%	0.34%	5.49%	1.50%
Camper 2 - Toddler	11.74%	52.34%	0.04%	0.03%	0.07%	15.97%	9.06%	0.08%	1.03%	2.22%	2.20%	n/a	5.09%	0.14%
Camper 2 - Child	10.80%	58.49%	0.04%	0.03%	0.07%	15.68%	8.89%	0.07%	1.01%	2.18%	1.72%	n/a	0.88%	0.15%
Camper 2 - Adult	15.16%	54.07%	0.04%	0.03%	0.07%	15.87%	9.00%	0.07%	1.03%	2.20%	1.18%	0.45%	0.66%	0.18%

Cadmium	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	2.71%	41.89%	0.02%	0.00%	0.21%	47.80%	1.56%	0.00%	1.60%	2.40%	0.59%	n/a	1.19%	0.03%
Camper 1 - Child	2.43%	45.62%	0.02%	0.00%	0.20%	54.66%	1.49%	0.00%	1.53%	2.29%	0.45%	n/a	0.20%	0.03%
Camper 1 - Adult	3.48%	43.03%	0.02%	0.00%	0.21%	47.20%	1.54%	0.00%	1.58%	2.37%	0.32%	0.06%	0.15%	0.04%
Camper 2 - Toddler	2.49%	38.53%	0.02%	0.00%	0.17%	51.07%	1.66%	0.00%	1.92%	2.21%	0.24%	n/a	1.64%	0.05%
Camper 2 - Child	2.25%	42.27%	0.02%	0.00%	0.17%	49.21%	1.60%	0.00%	1.85%	2.13%	0.18%	n/a	0.28%	0.05%
Camper 2 - Adult	3.21%	39.74%	0.02%	0.00%	0.17%	50.65%	1.65%	0.00%	1.90%	2.19%	0.13%	0.07%	0.21%	0.06%

Copper	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.66%	32.27%	0.02%	0.03%	0.06%	56.73%	9.01%	0.03%	0.05%	0.05%	0.36%	n/a	0.68%	0.06%
Camper 1 - Child	0.59%	35.39%	0.02%	0.03%	0.06%	54.66%	8.68%	0.03%	0.04%	0.05%	0.28%	n/a	0.11%	0.06%
Camper 1 - Adult	0.85%	33.22%	0.02%	0.03%	0.06%	56.17%	8.92%	0.03%	0.05%	0.05%	0.19%	0.25%	0.09%	0.07%
Camper 2 - Toddler	0.50%	24.44%	0.01%	0.02%	0.04%	64.28%	10.21%	0.04%	0.03%	0.04%	0.19%	n/a	0.19%	0.02%
Camper 2 - Child	0.45%	26.97%	0.01%	0.02%	0.04%	62.32%	9.90%	0.04%	0.02%	0.04%	0.14%	n/a	0.03%	0.02%
Camper 2 - Adult	0.64%	25.12%	0.01%	0.02%	0.04%	63.54%	10.09%	0.04%	0.02%	0.04%	0.10%	0.28%	0.02%	0.02%

Lead	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	1.68%	8.21%	17.11%	19.57%	0.09%	3.11%	0.44%	0.00%	0.85%	0.02%	0.30%	n/a	48.37%	0.25%
Camper 1 - Child	2.57%	15.29%	28.00%	32.02%	0.15%	5.08%	0.72%	0.00%	1.40%	0.02%	0.39%	n/a	13.91%	0.44%
Camper 1 - Adult	3.69%	14.43%	28.94%	33.09%	0.16%	5.25%	0.74%	0.00%	1.45%	0.03%	0.28%	0.77%	10.63%	0.55%
Camper 2 - Toddler	11.71%	57.24%	0.73%	0.67%	0.53%	21.55%	3.05%	0.01%	0.04%	0.11%	0.13%	n/a	4.22%	0.02%
Camper 2 - Child	10.58%	62.85%	0.70%	0.64%	0.51%	20.78%	2.95%	0.01%	0.04%	0.10%	0.10%	n/a	0.71%	0.02%
Camper 2 - Adult	14.46%	56.57%	0.69%	0.63%	0.50%	20.48%	2.90%	0.01%	0.04%	0.10%	0.07%	3.00%	0.52%	0.03%

Manganese	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	3.34%	47.03%	0.05%	0.11%	0.11%	16.64%	4.60%	0.21%	0.14%	0.02%	17.48%	n/a	9.45%	0.81%
Camper 1 - Child	3.29%	56.34%	0.05%	0.12%	0.12%	17.52%	4.84%	0.22%	0.15%	0.02%	14.68%	n/a	1.75%	0.91%
Camper 1 - Adult	3.43%	38.63%	0.04%	0.09%	0.09%	13.15%	3.64%	0.16%	0.11%	0.02%	7.48%	31.38%	0.97%	0.83%
Camper 2 - Toddler	2.33%	32.87%	0.15%	0.20%	0.15%	20.91%	5.78%	0.26%	0.63%	0.02%	12.56%	n/a	22.22%	1.91%
Camper 2 - Child	2.61%	44.72%	0.18%	0.24%	0.18%	24.99%	6.91%	0.31%	0.76%	0.02%	11.98%	n/a	4.67%	2.43%
Camper 2 - Adult	2.38%	26.83%	0.12%	0.16%	0.12%	16.41%	4.54%	0.20%	0.50%	0.01%	5.34%	39.18%	2.27%	1.94%

Nickel	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	8.14%	28.08%	0.37%	0.32%	0.48%	27.12%	4.31%	0.68%	8.76%	0.68%	7.33%	n/a	10.55%	3.18%
Camper 1 - Child	8.16%	34.23%	0.40%	0.34%	0.51%	29.04%	4.61%	0.73%	9.38%	0.72%	6.26%	n/a	1.98%	3.62%
Camper 1 - Adult	11.10%	30.64%	0.39%	0.33%	0.50%	28.45%	4.52%	0.71%	9.19%	0.71%	4.17%	3.53%	1.44%	4.31%
Camper 2 - Toddler	8.58%	29.60%	0.31%	0.20%	0.45%	33.64%	5.34%	0.84%	7.84%	0.71%	2.55%	n/a	7.63%	2.30%
Camper 2 - Child	8.29%	34.77%	0.32%	0.21%	0.47%	34.72%	5.52%	0.87%	8.09%	0.74%	2.10%	n/a	1.38%	2.53%
Camper 2 - Adult	11.06%	30.54%	0.31%	0.20%	0.45%	33.38%	5.30%	0.83%	7.78%	0.71%	1.37%	4.14%	0.98%	2.95%

TABLE 4.5-4 (Cont'd)
PERCENTAGE BREAKDOWN BY PATHWAY FOR
“NO INTERVENTION” SCENARIO – FUTURE 1

Silver	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.01%	0.31%	0.00%	0.00%	0.00%	96.04%	3.24%	0.00%	0.06%	0.00%	0.04%	n/a	0.24%	0.05%
Camper 1 - Child	0.01%	0.35%	0.00%	0.00%	0.00%	96.19%	3.25%	0.00%	0.06%	0.00%	0.03%	n/a	0.04%	0.05%
Camper 1 - Adult	0.02%	0.32%	0.00%	0.00%	0.00%	96.22%	3.25%	0.00%	0.06%	0.00%	0.02%	0.01%	0.03%	0.07%
Camper 2 - Toddler	0.17%	4.24%	0.00%	0.00%	0.00%	92.11%	3.11%	0.00%	0.02%	0.02%	0.02%	n/a	0.26%	0.06%
Camper 2 - Child	0.16%	4.80%	0.00%	0.00%	0.00%	91.77%	3.10%	0.00%	0.02%	0.02%	0.02%	n/a	0.04%	0.06%
Camper 2 - Adult	0.22%	4.40%	0.00%	0.00%	0.00%	92.10%	3.11%	0.00%	0.02%	0.02%	0.01%	0.01%	0.03%	0.07%

Thallium	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	n/a	n/a	0.43%	1.63%	0.11%	86.98%	6.91%	1.01%	2.39%	n/a	0.54%	n/a	n/a	n/a
Camper 1 - Child	n/a	n/a	0.43%	1.63%	0.11%	87.08%	6.92%	1.01%	2.39%	n/a	0.43%	n/a	n/a	n/a
Camper 1 - Adult	n/a	n/a	0.40%	1.50%	0.10%	80.11%	6.36%	0.93%	2.20%	n/a	0.27%	8.12%	n/a	n/a
Camper 2 - Toddler	n/a	n/a	0.09%	0.14%	0.09%	89.13%	7.08%	1.03%	1.87%	n/a	0.58%	n/a	n/a	n/a
Camper 2 - Child	n/a	n/a	0.09%	0.14%	0.09%	89.23%	7.09%	1.03%	1.87%	n/a	0.46%	n/a	n/a	n/a
Camper 2 - Adult	n/a	n/a	0.08%	0.13%	0.08%	81.94%	6.51%	0.95%	1.72%	n/a	0.29%	8.31%	n/a	n/a

Tin	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	n/a	n/a	0.69%	0.63%	0.58%	26.48%	8.41%	3.11%	15.59%	n/a	25.63%	n/a	17.39%	1.50%
Camper 1 - Child	n/a	n/a	0.85%	0.78%	0.71%	32.86%	10.44%	3.86%	19.34%	n/a	25.38%	n/a	3.79%	1.98%
Camper 1 - Adult	n/a	n/a	0.89%	0.82%	0.75%	34.59%	10.99%	4.06%	20.36%	n/a	18.14%	3.90%	2.95%	2.53%
Camper 2 - Toddler	n/a	n/a	1.32%	2.15%	0.75%	37.26%	11.84%	4.37%	23.12%	n/a	2.00%	n/a	15.83%	1.36%
Camper 2 - Child	n/a	n/a	1.52%	2.48%	0.87%	43.01%	13.67%	5.05%	26.69%	n/a	1.85%	n/a	3.21%	1.67%
Camper 2 - Adult	n/a	n/a	1.46%	2.39%	0.83%	41.44%	13.17%	4.86%	25.72%	n/a	1.21%	4.67%	2.29%	1.96%

Zinc	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.14%	11.08%	0.24%	0.15%	0.27%	78.08%	5.82%	2.79%	0.86%	0.34%	0.02%	n/a	0.19%	0.003%
Camper 1 - Child	0.13%	12.44%	0.24%	0.15%	0.27%	77.03%	5.74%	2.76%	0.85%	0.34%	0.02%	n/a	0.03%	0.003%
Camper 1 - Adult	0.19%	11.48%	0.24%	0.15%	0.27%	77.81%	5.80%	2.78%	0.86%	0.34%	0.01%	0.04%	0.02%	0.004%
Camper 2 - Toddler	0.02%	1.41%	0.09%	0.05%	0.14%	88.12%	6.56%	3.15%	0.35%	0.04%	0.01%	n/a	0.05%	0.001%
Camper 2 - Child	0.02%	1.61%	0.09%	0.05%	0.14%	87.98%	6.55%	3.15%	0.35%	0.04%	0.01%	n/a	0.01%	0.001%
Camper 2 - Adult	0.02%	1.47%	0.09%	0.05%	0.14%	88.07%	6.56%	3.15%	0.35%	0.04%	0.01%	0.04%	0.01%	0.001%

Intakes are presented in Table 4.5-5 for the “No Intervention” Future 3 scenario, when the full acid generating potential occurs. This is a very unlikely scenario. Not surprisingly, these intakes are the highest of all the scenarios considered in this assessment. As described above, thallium and tin intakes have not changed, as there were no measured water concentrations available to predict into the future.

Table 4.5-6 provides the percentage breakdown by pathway. Consumption of fish and moose are still the greatest exposure pathways of all COPC excepting lead for Camper 1 toddler in this scenario. Soil ingestion by the toddler is still the dominant pathway of exposure to lead.

TABLE 4.5-5
HUMAN INTAKES OF COPC FOR “NO INTERVENTION” SCENARIO – FUTURE 3

Arsenic mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	1.24x10 ⁻⁵	5.52x10 ⁻⁵	6.40x10 ⁻⁸	6.74x10 ⁻⁸	3.72x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.68x10 ⁻⁸	1.34x10 ⁻⁶	2.34x10 ⁻⁶	3.46x10 ⁻⁷	0.00	1.23x10 ⁻⁵	8.97x10 ⁻⁵	3.39x10 ⁻⁷
Camper 1 - Child	8.28x10 ⁻⁶	4.48x10 ⁻⁵	4.57x10 ⁻⁸	4.81x10 ⁻⁸	2.66x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.20x10 ⁻⁸	9.55x10 ⁻⁷	1.67x10 ⁻⁶	1.97x10 ⁻⁷	0.00	1.54x10 ⁻⁶	6.16x10 ⁻⁵	2.58x10 ⁻⁷
Camper 1 - Adult	7.22x10 ⁻⁶	2.58x10 ⁻⁵	2.87x10 ⁻⁸	3.02x10 ⁻⁸	1.67x10 ⁻⁸	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.56x10 ⁻⁹	6.00x10 ⁻⁷	1.05x10 ⁻⁶	8.41x10 ⁻⁸	4.51x10 ⁻⁸	7.18x10 ⁻⁷	3.81x10 ⁻⁵	1.97x10 ⁻⁷
Camper 2 - Toddler	2.62x10 ⁻⁶	1.17x10 ⁻⁵	9.23x10 ⁻⁹	6.22x10 ⁻⁹	1.50x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.68x10 ⁻⁸	2.31x10 ⁻⁷	4.95x10 ⁻⁷	4.91x10 ⁻⁷	0.00	1.14x10 ⁻⁶	2.23x10 ⁻⁵	3.13x10 ⁻⁸
Camper 2 - Child	1.75x10 ⁻⁶	9.49x10 ⁻⁶	6.59x10 ⁻⁹	4.44x10 ⁻⁹	1.07x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.20x10 ⁻⁸	1.65x10 ⁻⁷	3.53x10 ⁻⁷	2.80x10 ⁻⁷	0.00	1.43x10 ⁻⁷	1.62x10 ⁻⁵	2.38x10 ⁻⁸
Camper 2 - Adult	1.53x10 ⁻⁶	5.45x10 ⁻⁶	4.14x10 ⁻⁹	2.79x10 ⁻⁹	6.73x10 ⁻⁹	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.56x10 ⁻⁹	1.04x10 ⁻⁷	2.22x10 ⁻⁷	1.19x10 ⁻⁷	4.51x10 ⁻⁸	6.63x10 ⁻⁸	1.01x10 ⁻⁵	1.82x10 ⁻⁸

Cadmium mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	5.79x10 ⁻⁶	8.96x10 ⁻⁵	1.82x10 ⁻⁸	4.07x10 ⁻⁹	3.88x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	2.82x10 ⁻⁹	1.58x10 ⁻⁶	5.13x10 ⁻⁶	5.78x10 ⁻⁷	0.00	1.16x10 ⁻⁶	1.52x10 ⁻⁴	3.20x10 ⁻⁸
Camper 1 - Child	3.87x10 ⁻⁶	7.28x10 ⁻⁵	1.30x10 ⁻⁸	2.90x10 ⁻⁹	2.77x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	2.01x10 ⁻⁹	1.13x10 ⁻⁶	3.66x10 ⁻⁶	3.29x10 ⁻⁷	0.00	1.45x10 ⁻⁷	1.17x10 ⁻⁴	2.43x10 ⁻⁸
Camper 1 - Adult	3.38x10 ⁻⁶	4.18x10 ⁻⁵	8.16x10 ⁻⁹	1.83x10 ⁻⁹	1.74x10 ⁻⁷	2.09x10 ⁻⁵	6.81x10 ⁻⁷	1.26x10 ⁻⁹	7.11x10 ⁻⁷	2.30x10 ⁻⁶	1.40x10 ⁻⁷	2.71x10 ⁻⁸	6.76x10 ⁻⁸	7.02x10 ⁻⁵	1.85x10 ⁻⁸
Camper 2 - Toddler	2.27x10 ⁻⁶	3.51x10 ⁻⁵	1.99x10 ⁻⁸	4.20x10 ⁻⁹	1.57x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	2.82x10 ⁻⁹	1.75x10 ⁻⁶	2.01x10 ⁻⁶	2.18x10 ⁻⁷	0.00	1.50x10 ⁻⁶	9.11x10 ⁻⁵	4.12x10 ⁻⁸
Camper 2 - Child	1.52x10 ⁻⁶	2.85x10 ⁻⁵	1.42x10 ⁻⁸	3.00x10 ⁻⁹	1.12x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	2.01x10 ⁻⁹	1.25x10 ⁻⁶	1.44x10 ⁻⁶	1.24x10 ⁻⁷	0.00	1.87x10 ⁻⁷	6.75x10 ⁻⁵	3.13x10 ⁻⁸
Camper 2 - Adult	1.33x10 ⁻⁶	1.64x10 ⁻⁵	8.95x10 ⁻⁹	1.88x10 ⁻⁹	7.07x10 ⁻⁸	2.09x10 ⁻⁵	6.81x10 ⁻⁷	1.26x10 ⁻⁹	7.84x10 ⁻⁷	9.03x10 ⁻⁷	5.30x10 ⁻⁸	2.71x10 ⁻⁸	8.72x10 ⁻⁸	4.12x10 ⁻⁵	2.39x10 ⁻⁸

Copper mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	1.31x10 ⁻⁴	6.44x10 ⁻³	1.46x10 ⁻⁶	1.96x10 ⁻⁶	9.45x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	2.08x10 ⁻⁶	2.77x10 ⁻⁶	1.05x10 ⁻⁵	1.85x10 ⁻⁵	0.00	3.49x10 ⁻⁵	1.00x10 ⁻²	3.00x10 ⁻⁶
Camper 1 - Child	8.78x10 ⁻⁵	5.23x10 ⁻³	1.04x10 ⁻⁶	1.40x10 ⁻⁶	6.74x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.49x10 ⁻⁶	1.98x10 ⁻⁶	7.48x10 ⁻⁶	1.05x10 ⁻⁵	0.00	4.37x10 ⁻⁶	7.77x10 ⁻³	2.28x10 ⁻⁶
Camper 1 - Adult	7.66x10 ⁻⁵	3.01x10 ⁻³	6.53x10 ⁻⁷	8.81x10 ⁻⁷	4.24x10 ⁻⁶	1.31x10 ⁻³	2.08x10 ⁻⁴	9.35x10 ⁻⁷	1.24x10 ⁻⁶	4.70x10 ⁻⁶	4.50x10 ⁻⁶	5.86x10 ⁻⁶	2.03x10 ⁻⁶	4.63x10 ⁻³	1.74x10 ⁻⁶
Camper 2 - Toddler	2.27x10 ⁻⁵	1.11x10 ⁻³	5.80x10 ⁻⁷	9.47x10 ⁻⁷	1.96x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	2.08x10 ⁻⁶	1.14x10 ⁻⁶	1.81x10 ⁻⁶	8.46x10 ⁻⁶	0.00	8.76x10 ⁻⁶	4.55x10 ⁻³	7.55x10 ⁻⁷
Camper 2 - Child	1.51x10 ⁻⁵	9.02x10 ⁻⁴	4.14x10 ⁻⁷	6.76x10 ⁻⁷	1.40x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.49x10 ⁻⁶	8.11x10 ⁻⁷	1.29x10 ⁻⁶	4.82x10 ⁻⁶	0.00	1.10x10 ⁻⁶	3.35x10 ⁻³	5.73x10 ⁻⁷
Camper 2 - Adult	1.32x10 ⁻⁵	5.18x10 ⁻⁴	2.60x10 ⁻⁷	4.25x10 ⁻⁷	8.80x10 ⁻⁷	1.31x10 ⁻³	2.08x10 ⁻⁴	9.35x10 ⁻⁷	5.10x10 ⁻⁷	8.12x10 ⁻⁷	2.06x10 ⁻⁶	5.86x10 ⁻⁶	5.11x10 ⁻⁷	2.06x10 ⁻³	4.38x10 ⁻⁷

TABLE 4.5-5 (Cont'd)
HUMAN INTAKES OF COPC FOR “NO INTERVENTION” SCENARIO – FUTURE 3

Lead mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	2.02x10 ⁻⁵	9.89x10 ⁻⁵	1.97x10 ⁻⁴	2.25x10 ⁻⁴	1.10x10 ⁻⁶	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.27x10 ⁻⁸	9.82x10 ⁻⁶	1.83x10 ⁻⁷	3.45x10 ⁻⁶	0.00	5.55x10 ⁻⁴	1.15x10 ⁻³	2.87x10 ⁻⁶
Camper 1 - Child	1.35x10 ⁻⁵	8.04x10 ⁻⁵	1.40x10 ⁻⁴	1.60x10 ⁻⁴	7.84x10 ⁻⁷	2.55x10 ⁻⁵	3.61x10 ⁻⁶	9.06x10 ⁻⁹	7.01x10 ⁻⁶	1.30x10 ⁻⁷	1.96x10 ⁻⁶	0.00	6.96x10 ⁻⁵	5.03x10 ⁻⁴	2.18x10 ⁻⁶
Camper 1 - Adult	1.18x10 ⁻⁵	4.62x10 ⁻⁵	8.82x10 ⁻⁵	1.01x10 ⁻⁴	4.93x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.70x10 ⁻⁹	4.41x10 ⁻⁶	8.20x10 ⁻⁸	8.39x10 ⁻⁷	2.34x10 ⁻⁶	3.24x10 ⁻⁵	3.06x10 ⁻⁴	1.66x10 ⁻⁶
Camper 2 - Toddler	1.94x10 ⁻⁵	9.47x10 ⁻⁵	1.21x10 ⁻⁶	1.10x10 ⁻⁶	8.70x10 ⁻⁷	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.27x10 ⁻⁸	6.72x10 ⁻⁸	1.75x10 ⁻⁷	2.21x10 ⁻⁷	0.00	6.98x10 ⁻⁶	1.65x10 ⁻⁴	3.61x10 ⁻⁸
Camper 2 - Child	1.30x10 ⁻⁵	7.70x10 ⁻⁵	8.62x10 ⁻⁷	7.88x10 ⁻⁷	6.21x10 ⁻⁷	2.55x10 ⁻⁵	3.61x10 ⁻⁶	9.06x10 ⁻⁹	4.80x10 ⁻⁸	1.25x10 ⁻⁷	1.26x10 ⁻⁷	0.00	8.75x10 ⁻⁷	1.22x10 ⁻⁴	2.74x10 ⁻⁸
Camper 2 - Adult	1.13x10 ⁻⁵	4.42x10 ⁻⁵	5.42x10 ⁻⁷	4.96x10 ⁻⁷	3.91x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.70x10 ⁻⁹	3.02x10 ⁻⁸	7.85x10 ⁻⁸	5.38x10 ⁻⁸	2.34x10 ⁻⁶	4.07x10 ⁻⁷	7.81x10 ⁻⁵	2.09x10 ⁻⁸

Manganese mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	5.61x10 ⁻⁴	7.90x10 ⁻³	1.67x10 ⁻⁶	3.93x10 ⁻⁶	4.52x10 ⁻⁶	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.38x10 ⁻⁶	4.94x10 ⁻⁶	3.63x10 ⁻⁶	5.99x10 ⁻⁴	0.00	3.24x10 ⁻⁴	1.01x10 ⁻²	2.79x10 ⁻⁵
Camper 1 - Child	3.75x10 ⁻⁴	6.42x10 ⁻³	1.19x10 ⁻⁶	2.81x10 ⁻⁶	3.22x10 ⁻⁶	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.27x10 ⁻⁶	3.52x10 ⁻⁶	2.59x10 ⁻⁶	3.41x10 ⁻⁴	0.00	4.06x10 ⁻⁵	7.71x10 ⁻³	2.12x10 ⁻⁵
Camper 1 - Adult	3.27x10 ⁻⁴	3.69x10 ⁻³	7.50x10 ⁻⁷	1.77x10 ⁻⁶	2.03x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.31x10 ⁻⁶	2.22x10 ⁻⁶	1.63x10 ⁻⁶	1.46x10 ⁻⁴	6.11x10 ⁻⁴	1.89x10 ⁻⁵	5.13x10 ⁻³	1.62x10 ⁻⁵
Camper 2 - Toddler	6.36x10 ⁻⁵	8.97x10 ⁻⁴	4.10x10 ⁻⁶	5.53x10 ⁻⁶	4.06x10 ⁻⁶	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.38x10 ⁻⁶	1.73x10 ⁻⁵	4.12x10 ⁻⁷	3.43x10 ⁻⁴	0.00	6.06x10 ⁻⁴	2.68x10 ⁻³	5.22x10 ⁻⁵
Camper 2 - Child	4.26x10 ⁻⁵	7.29x10 ⁻⁴	2.93x10 ⁻⁶	3.95x10 ⁻⁶	2.90x10 ⁻⁶	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.27x10 ⁻⁶	1.23x10 ⁻⁵	2.94x10 ⁻⁷	1.95x10 ⁻⁴	0.00	7.60x10 ⁻⁵	1.59x10 ⁻³	3.97x10 ⁻⁵
Camper 2 - Adult	3.71x10 ⁻⁵	4.19x10 ⁻⁴	1.84x10 ⁻⁶	2.48x10 ⁻⁶	1.82x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.31x10 ⁻⁶	7.76x10 ⁻⁶	1.85x10 ⁻⁷	8.33x10 ⁻⁵	6.11x10 ⁻⁴	3.54x10 ⁻⁵	1.53x10 ⁻³	3.03x10 ⁻⁵

Nickel mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	9.32x10 ⁻⁶	3.21x10 ⁻⁵	2.50x10 ⁻⁷	2.20x10 ⁻⁷	3.65x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.72x10 ⁻⁷	5.85x10 ⁻⁶	7.74x10 ⁻⁷	4.82x10 ⁻⁶	0.00	6.94x10 ⁻⁶	8.18x10 ⁻⁵	2.09x10 ⁻⁶
Camper 1 - Child	6.23x10 ⁻⁶	2.61x10 ⁻⁵	1.79x10 ⁻⁷	1.57x10 ⁻⁷	2.61x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.37x10 ⁻⁷	4.18x10 ⁻⁶	5.52x10 ⁻⁷	2.74x10 ⁻⁶	0.00	8.70x10 ⁻⁷	5.64x10 ⁻⁵	1.59x10 ⁻⁶
Camper 1 - Adult	5.43x10 ⁻⁶	1.50x10 ⁻⁵	1.12x10 ⁻⁷	9.89x10 ⁻⁸	1.64x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	2.12x10 ⁻⁷	2.63x10 ⁻⁶	3.47x10 ⁻⁷	1.17x10 ⁻⁶	9.92x10 ⁻⁷	4.05x10 ⁻⁷	3.58x10 ⁻⁵	1.21x10 ⁻⁶
Camper 2 - Toddler	4.55x10 ⁻⁶	1.57x10 ⁻⁵	1.64x10 ⁻⁷	1.07x10 ⁻⁷	2.39x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.72x10 ⁻⁷	4.15x10 ⁻⁶	3.78x10 ⁻⁷	1.35x10 ⁻⁶	0.00	4.04x10 ⁻⁶	5.18x10 ⁻⁵	1.22x10 ⁻⁶
Camper 2 - Child	3.04x10 ⁻⁶	1.27x10 ⁻⁵	1.17x10 ⁻⁷	7.66x10 ⁻⁸	1.71x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.37x10 ⁻⁷	2.96x10 ⁻⁶	2.69x10 ⁻⁷	7.70x10 ⁻⁷	0.00	5.07x10 ⁻⁷	3.57x10 ⁻⁵	9.26x10 ⁻⁷
Camper 2 - Adult	2.65x10 ⁻⁶	7.32x10 ⁻⁶	7.38x10 ⁻⁸	4.82x10 ⁻⁸	1.07x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	2.12x10 ⁻⁷	1.86x10 ⁻⁶	1.69x10 ⁻⁷	3.29x10 ⁻⁷	9.92x10 ⁻⁷	2.36x10 ⁻⁷	2.33x10 ⁻⁵	7.07x10 ⁻⁷

TABLE 4.5-5 (Cont'd)
HUMAN INTAKES OF COPC FOR “NO INTERVENTION” SCENARIO – FUTURE 3

Silver mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	1.37x10 ⁻⁷	3.42x10 ⁻⁶	6.22x10 ⁻⁹	6.38x10 ⁻⁹	5.01x10 ⁻⁹	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.88x10 ⁻⁹	1.60x10 ⁻⁷	1.59x10 ⁻⁸	9.93x10 ⁻⁸	0.00	6.06x10 ⁻⁷	2.59x10 ⁻⁴	1.31x10 ⁻⁷
Camper 1 - Child	9.19x10 ⁻⁸	2.78x10 ⁻⁶	4.44x10 ⁻⁹	4.55x10 ⁻⁹	3.58x10 ⁻⁹	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.48x10 ⁻⁹	1.14x10 ⁻⁷	1.13x10 ⁻⁸	5.66x10 ⁻⁸	0.00	7.60x10 ⁻⁸	1.85x10 ⁻⁴	9.91x10 ⁻⁸
Camper 1 - Adult	8.02x10 ⁻⁸	1.60x10 ⁻⁶	2.79x10 ⁻⁹	2.86x10 ⁻⁹	2.25x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.19x10 ⁻⁹	7.17x10 ⁻⁸	7.13x10 ⁻⁹	2.41x10 ⁻⁸	9.02x10 ⁻⁹	3.54x10 ⁻⁸	1.16x10 ⁻⁴	7.57x10 ⁻⁸
Camper 2 - Toddler	4.55x10 ⁻⁷	1.13x10 ⁻⁵	2.28x10 ⁻⁹	2.54x10 ⁻⁹	8.40x10 ⁻⁹	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.88x10 ⁻⁹	5.46x10 ⁻⁸	5.26x10 ⁻⁸	5.17x10 ⁻⁸	0.00	6.85x10 ⁻⁷	2.67x10 ⁻⁴	1.47x10 ⁻⁷
Camper 2 - Child	3.04x10 ⁻⁷	9.19x10 ⁻⁶	1.63x10 ⁻⁹	1.82x10 ⁻⁹	6.00x10 ⁻⁹	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.48x10 ⁻⁹	3.89x10 ⁻⁸	3.75x10 ⁻⁸	2.94x10 ⁻⁸	0.00	8.58x10 ⁻⁸	1.91x10 ⁻⁴	1.12x10 ⁻⁷
Camper 2 - Adult	2.65x10 ⁻⁷	5.28x10 ⁻⁶	1.02x10 ⁻⁹	1.14x10 ⁻⁹	3.77x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.19x10 ⁻⁹	2.45x10 ⁻⁸	2.36x10 ⁻⁸	1.26x10 ⁻⁸	9.02x10 ⁻⁹	3.99x10 ⁻⁸	1.20x10 ⁻⁴	8.55x10 ⁻⁸

Thallium mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	0.00	0.00	1.77x10 ⁻⁸	6.69x10 ⁻⁸	4.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.79x10 ⁻⁸	0.00	2.21x10 ⁻⁸	0.00	0.00	4.10x10 ⁻⁶	0.00
Camper 1 - Child	0.00	0.00	1.26x10 ⁻⁸	4.78x10 ⁻⁸	3.22x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.99x10 ⁻⁸	0.00	1.26x10 ⁻⁸	0.00	0.00	2.92x10 ⁻⁶	0.00
Camper 1 - Adult	0.00	0.00	7.94x10 ⁻⁹	3.00x10 ⁻⁸	2.03x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.39x10 ⁻⁸	0.00	5.36x10 ⁻⁹	1.62x10 ⁻⁷	0.00	2.00x10 ⁻⁶	0.00
Camper 2 - Toddler	0.00	0.00	3.55x10 ⁻⁹	5.71x10 ⁻⁹	3.41x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	7.47x10 ⁻⁸	0.00	2.32x10 ⁻⁸	0.00	0.00	4.00x10 ⁻⁶	0.00
Camper 2 - Child	0.00	0.00	2.53x10 ⁻⁹	4.08x10 ⁻⁹	2.43x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	5.33x10 ⁻⁸	0.00	1.32x10 ⁻⁸	0.00	0.00	2.85x10 ⁻⁶	0.00
Camper 2 - Adult	0.00	0.00	1.59x10 ⁻⁹	2.56x10 ⁻⁹	1.53x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	3.35x10 ⁻⁸	0.00	5.64x10 ⁻⁹	1.62x10 ⁻⁷	0.00	1.95x10 ⁻⁶	0.00

Tin mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	0.00	0.00	9.23x10 ⁻⁸	8.47x10 ⁻⁸	7.74x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	2.10x10 ⁻⁶	0.00	3.45x10 ⁻⁶	0.00	2.34x10 ⁻⁶	1.33x10 ⁻⁵	2.02x10 ⁻⁷
Camper 1 - Child	0.00	0.00	6.58x10 ⁻⁸	6.05x10 ⁻⁸	5.53x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	1.50x10 ⁻⁶	0.00	1.97x10 ⁻⁶	0.00	2.94x10 ⁻⁷	7.59x10 ⁻⁶	1.53x10 ⁻⁷
Camper 1 - Adult	0.00	0.00	4.14x10 ⁻⁸	3.80x10 ⁻⁸	3.48x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	9.42x10 ⁻⁷	0.00	8.39x10 ⁻⁷	1.80x10 ⁻⁷	1.37x10 ⁻⁷	4.51x10 ⁻⁶	1.17x10 ⁻⁷
Camper 2 - Toddler	0.00	0.00	1.26x10 ⁻⁷	2.05x10 ⁻⁷	7.17x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	2.21x10 ⁻⁶	0.00	1.92x10 ⁻⁷	0.00	1.52x10 ⁻⁶	9.44x10 ⁻⁶	1.31x10 ⁻⁷
Camper 2 - Child	0.00	0.00	8.99x10 ⁻⁸	1.47x10 ⁻⁷	5.12x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	1.58x10 ⁻⁶	0.00	1.09x10 ⁻⁷	0.00	1.90x10 ⁻⁷	5.82x10 ⁻⁶	9.91x10 ⁻⁸
Camper 2 - Adult	0.00	0.00	5.65x10 ⁻⁸	9.22x10 ⁻⁸	3.22x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	9.93x10 ⁻⁷	0.00	4.66x10 ⁻⁸	1.80x10 ⁻⁷	8.84x10 ⁻⁸	3.79x10 ⁻⁶	7.57x10 ⁻⁸

TABLE 4.5-5 (Cont'd)
HUMAN INTAKES OF COPC FOR “NO INTERVENTION” SCENARIO – FUTURE 3

Zinc mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	2.72x10 ⁻³	2.10x10 ⁻¹	6.46x10 ⁻⁴	5.05x10 ⁻⁴	2.65x10 ⁻³	1.83x10 ⁻¹	1.37x10 ⁻²	1.29x10 ⁻²	2.18x10 ⁻³	6.45x10 ⁻³	5.63x10 ⁻⁵	0.00	4.45x10 ⁻⁴	4.36x10 ⁻¹	7.67x10 ⁻⁶
Camper 1 - Child	1.82x10 ⁻³	1.71x10 ⁻¹	4.61x10 ⁻⁴	3.60x10 ⁻⁴	1.89x10 ⁻³	1.31x10 ⁻¹	9.74x10 ⁻³	9.20x10 ⁻³	1.55x10 ⁻³	4.61x10 ⁻³	3.20x10 ⁻⁵	0.00	5.58x10 ⁻⁵	3.32x10 ⁻¹	5.83x10 ⁻⁶
Camper 1 - Adult	1.59x10 ⁻³	9.82x10 ⁻²	2.90x10 ⁻⁴	2.27x10 ⁻⁴	1.19x10 ⁻³	8.23x10 ⁻²	6.13x10 ⁻³	5.79x10 ⁻³	9.77x10 ⁻⁴	2.90x10 ⁻³	1.37x10 ⁻⁵	3.88x10 ⁻⁵	2.60x10 ⁻⁵	2.00x10 ⁻¹	4.45x10 ⁻⁶
Camper 2 - Toddler	3.80x10 ⁻⁵	2.94x10 ⁻³	1.97x10 ⁻⁴	9.73x10 ⁻⁵	2.83x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	1.29x10 ⁻²	7.36x10 ⁻⁴	9.01x10 ⁻⁵	2.96x10 ⁻⁵	0.00	9.68x10 ⁻⁵	2.14x10 ⁻¹	1.67x10 ⁻⁶
Camper 2 - Child	2.54x10 ⁻⁵	2.39x10 ⁻³	1.41x10 ⁻⁴	6.95x10 ⁻⁵	2.02x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	9.20x10 ⁻³	5.25x10 ⁻⁴	6.43x10 ⁻⁵	1.69x10 ⁻⁵	0.00	1.21x10 ⁻⁵	1.53x10 ⁻¹	1.27x10 ⁻⁶
Camper 2 - Adult	2.22x10 ⁻⁵	1.37x10 ⁻³	8.86x10 ⁻⁵	4.37x10 ⁻⁵	1.27x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	5.79x10 ⁻³	3.30x10 ⁻⁴	4.04x10 ⁻⁵	7.20x10 ⁻⁶	3.88x10 ⁻⁵	5.65x10 ⁻⁶	9.63x10 ⁻²	9.67x10 ⁻⁷

TABLE 4.5-6
PERCENTAGE BREAKDOWN BY PATHWAY FOR
“NO INTERVENTION” SCENARIO – FUTURE 3

Percent Intake by Pathway														
Arsenic	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	13.75%	61.32%	0.07%	0.07%	0.04%	3.96%	2.25%	0.02%	1.49%	2.60%	0.38%	n/a	13.67%	0.38%
Camper 1 - Child	13.38%	72.49%	0.07%	0.08%	0.04%	4.11%	2.33%	0.02%	1.54%	2.70%	0.32%	n/a	2.49%	0.42%
Camper 1 - Adult	18.88%	67.31%	0.08%	0.08%	0.04%	4.18%	2.37%	0.02%	1.57%	2.74%	0.22%	0.12%	1.88%	0.51%
Camper 2 - Toddler	11.74%	52.34%	0.04%	0.03%	0.07%	15.97%	9.06%	0.08%	1.03%	2.22%	2.20%	n/a	5.09%	0.14%
Camper 2 - Child	10.80%	58.49%	0.04%	0.03%	0.07%	15.68%	8.89%	0.07%	1.01%	2.18%	1.72%	n/a	0.88%	0.15%
Camper 2 - Adult	15.16%	54.07%	0.04%	0.03%	0.07%	15.87%	9.00%	0.07%	1.03%	2.20%	1.18%	0.45%	0.66%	0.18%

Cadmium	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	3.80%	58.79%	0.01%	0.00%	0.25%	30.57%	1.00%	0.00%	1.04%	3.37%	0.38%	n/a	0.76%	0.02%
Camper 1 - Child	3.32%	62.44%	0.01%	0.00%	0.24%	28.52%	0.93%	0.00%	0.97%	3.14%	0.28%	n/a	0.12%	0.02%
Camper 1 - Adult	4.81%	59.54%	0.01%	0.00%	0.25%	29.77%	0.97%	0.00%	1.01%	3.28%	0.20%	0.04%	0.10%	0.03%
Camper 2 - Toddler	2.49%	38.53%	0.02%	0.00%	0.17%	51.07%	1.66%	0.00%	1.92%	2.21%	0.24%	n/a	1.64%	0.05%
Camper 2 - Child	2.25%	42.27%	0.02%	0.00%	0.17%	49.21%	1.60%	0.00%	1.85%	2.13%	0.18%	n/a	0.28%	0.05%
Camper 2 - Adult	3.21%	39.74%	0.02%	0.00%	0.17%	50.65%	1.65%	0.00%	1.90%	2.19%	0.13%	0.07%	0.21%	0.06%

Copper	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	1.31%	64.13%	0.01%	0.02%	0.09%	29.10%	4.62%	0.02%	0.03%	0.10%	0.18%	n/a	0.35%	0.03%
Camper 1 - Child	1.13%	67.30%	0.01%	0.02%	0.09%	26.83%	4.26%	0.02%	0.03%	0.10%	0.14%	n/a	0.06%	0.03%
Camper 1 - Adult	1.66%	64.93%	0.01%	0.02%	0.09%	28.33%	4.50%	0.02%	0.03%	0.10%	0.10%	0.13%	0.04%	0.04%
Camper 2 - Toddler	0.50%	24.44%	0.01%	0.02%	0.04%	64.28%	10.21%	0.05%	0.03%	0.04%	0.19%	n/a	0.19%	0.02%
Camper 2 - Child	0.45%	26.97%	0.01%	0.02%	0.04%	62.31%	9.90%	0.04%	0.02%	0.04%	0.14%	n/a	0.03%	0.02%
Camper 2 - Adult	0.64%	25.12%	0.01%	0.02%	0.04%	63.54%	10.09%	0.05%	0.02%	0.04%	0.10%	0.28%	0.02%	0.02%

Lead	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	1.75%	8.57%	17.03%	19.48%	0.10%	3.09%	0.44%	0.00%	0.85%	0.02%	0.30%	n/a	48.13%	0.25%
Camper 1 - Child	2.68%	15.90%	27.76%	31.74%	0.16%	5.04%	0.71%	0.00%	1.39%	0.03%	0.39%	n/a	13.78%	0.43%
Camper 1 - Adult	3.84%	15.01%	28.68%	32.80%	0.16%	5.20%	0.74%	0.00%	1.43%	0.03%	0.27%	0.76%	10.54%	0.54%
Camper 2 - Toddler	11.71%	57.24%	0.73%	0.67%	0.53%	21.55%	3.05%	0.01%	0.04%	0.11%	0.13%	n/a	4.22%	0.02%
Camper 2 - Child	10.58%	62.85%	0.70%	0.64%	0.51%	20.78%	2.95%	0.01%	0.04%	0.10%	0.10%	n/a	0.71%	0.02%
Camper 2 - Adult	14.46%	56.57%	0.69%	0.63%	0.50%	20.48%	2.90%	0.01%	0.04%	0.10%	0.07%	3.00%	0.52%	0.03%

Manganese	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	5.51%	77.71%	0.02%	0.04%	0.04%	5.61%	1.55%	0.07%	0.05%	0.04%	5.89%	n/a	3.19%	0.27%
Camper 1 - Child	4.85%	82.98%	0.02%	0.04%	0.04%	5.26%	1.46%	0.07%	0.05%	0.03%	4.41%	n/a	0.53%	0.27%
Camper 1 - Adult	6.36%	71.67%	0.01%	0.03%	0.04%	4.98%	1.38%	0.06%	0.04%	0.03%	2.83%	11.88%	0.37%	0.31%
Camper 2 - Toddler	2.33%	32.86%	0.15%	0.20%	0.15%	20.91%	5.78%	0.27%	0.63%	0.02%	12.56%	n/a	22.22%	1.91%
Camper 2 - Child	2.61%	44.71%	0.18%	0.24%	0.18%	24.99%	6.91%	0.32%	0.76%	0.02%	11.98%	n/a	4.67%	2.43%
Camper 2 - Adult	2.38%	26.83%	0.12%	0.16%	0.12%	16.41%	4.54%	0.21%	0.50%	0.01%	5.34%	39.18%	2.27%	1.94%

Nickel	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	11.10%	38.31%	0.30%	0.26%	0.44%	21.25%	3.38%	0.56%	6.97%	0.92%	5.74%	n/a	8.27%	2.49%
Camper 1 - Child	10.75%	45.06%	0.31%	0.27%	0.45%	21.95%	3.49%	0.58%	7.21%	0.95%	4.74%	n/a	1.50%	2.74%
Camper 1 - Adult	14.67%	40.49%	0.30%	0.27%	0.44%	21.59%	3.43%	0.57%	7.09%	0.94%	3.16%	2.68%	1.09%	3.27%
Camper 2 - Toddler	8.57%	29.58%	0.31%	0.20%	0.45%	33.62%	5.34%	0.89%	7.83%	0.71%	2.55%	n/a	7.63%	2.30%
Camper 2 - Child	8.29%	34.76%	0.32%	0.21%	0.47%	34.70%	5.51%	0.92%	8.08%	0.73%	2.10%	n/a	1.38%	2.53%
Camper 2 - Adult	11.06%	30.53%	0.31%	0.20%	0.45%	33.36%	5.30%	0.88%	7.77%	0.71%	1.37%	4.14%	0.98%	2.95%

TABLE 4.5-6 (Cont'd)
PERCENTAGE BREAKDOWN BY PATHWAY FOR
“NO INTERVENTION” SCENARIO – FUTURE 3

Silver	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.05%	1.32%	0.00%	0.00%	0.00%	95.02%	3.21%	0.00%	0.06%	0.01%	0.04%	n/a	0.23%	0.05%
Camper 1 - Child	0.05%	1.50%	0.00%	0.00%	0.00%	95.03%	3.21%	0.00%	0.06%	0.01%	0.03%	n/a	0.04%	0.05%
Camper 1 - Adult	0.07%	1.38%	0.00%	0.00%	0.00%	95.14%	3.21%	0.00%	0.06%	0.01%	0.02%	0.01%	0.03%	0.07%
Camper 2 - Toddler	0.17%	4.24%	0.00%	0.00%	0.00%	92.11%	3.11%	0.00%	0.02%	0.02%	0.02%	n/a	0.26%	0.06%
Camper 2 - Child	0.16%	4.80%	0.00%	0.00%	0.00%	91.77%	3.10%	0.00%	0.02%	0.02%	0.02%	n/a	0.04%	0.06%
Camper 2 - Adult	0.22%	4.40%	0.00%	0.00%	0.00%	92.10%	3.11%	0.00%	0.02%	0.02%	0.01%	0.01%	0.03%	0.07%

Thallium	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	n/a	n/a	0.43%	1.63%	0.11%	86.98%	6.91%	1.01%	2.39%	n/a	0.54%	n/a	n/a	n/a
Camper 1 - Child	n/a	n/a	0.43%	1.63%	0.11%	87.08%	6.92%	1.01%	2.39%	n/a	0.43%	n/a	n/a	n/a
Camper 1 - Adult	n/a	n/a	0.40%	1.50%	0.10%	80.11%	6.36%	0.93%	2.20%	n/a	0.27%	8.12%	n/a	n/a
Camper 2 - Toddler	n/a	n/a	0.09%	0.14%	0.09%	89.13%	7.08%	1.03%	1.87%	n/a	0.58%	n/a	n/a	n/a
Camper 2 - Child	n/a	n/a	0.09%	0.14%	0.09%	89.23%	7.09%	1.03%	1.87%	n/a	0.46%	n/a	n/a	n/a
Camper 2 - Adult	n/a	n/a	0.08%	0.13%	0.08%	81.94%	6.51%	0.95%	1.72%	n/a	0.29%	8.31%	n/a	n/a

Tin	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	n/a	n/a	0.69%	0.63%	0.58%	26.48%	8.41%	3.11%	15.59%	n/a	25.63%	n/a	17.39%	1.50%
Camper 1 - Child	n/a	n/a	0.85%	0.78%	0.71%	32.86%	10.44%	3.86%	19.34%	n/a	25.38%	n/a	3.79%	1.98%
Camper 1 - Adult	n/a	n/a	0.89%	0.82%	0.75%	34.59%	10.99%	4.06%	20.36%	n/a	18.14%	3.90%	2.95%	2.53%
Camper 2 - Toddler	n/a	n/a	1.32%	2.15%	0.75%	37.26%	11.84%	4.37%	23.12%	n/a	2.00%	n/a	15.83%	1.36%
Camper 2 - Child	n/a	n/a	1.52%	2.48%	0.87%	43.01%	13.67%	5.05%	26.69%	n/a	1.85%	n/a	3.21%	1.67%
Camper 2 - Adult	n/a	n/a	1.46%	2.39%	0.83%	41.44%	13.17%	4.86%	25.72%	n/a	1.21%	4.67%	2.29%	1.96%

Zinc	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.62%	48.28%	0.15%	0.12%	0.61%	42.04%	3.13%	2.96%	0.50%	1.48%	0.01%	n/a	0.10%	0.002%
Camper 1 - Child	0.55%	51.58%	0.14%	0.11%	0.57%	39.45%	2.94%	2.77%	0.47%	1.39%	0.01%	n/a	0.02%	0.002%
Camper 1 - Adult	0.80%	49.20%	0.15%	0.11%	0.60%	41.20%	3.07%	2.90%	0.49%	1.45%	0.01%	0.02%	0.01%	0.002%
Camper 2 - Toddler	0.02%	1.37%	0.09%	0.05%	0.13%	85.51%	6.37%	6.01%	0.34%	0.04%	0.01%	n/a	0.05%	0.001%
Camper 2 - Child	0.02%	1.56%	0.09%	0.05%	0.13%	85.39%	6.36%	6.00%	0.34%	0.04%	0.01%	n/a	0.01%	0.001%
Camper 2 - Adult	0.02%	1.42%	0.09%	0.05%	0.13%	85.47%	6.37%	6.01%	0.34%	0.04%	0.01%	0.04%	0.01%	0.001%

4.5.3 “Remediation” Scenario

As described in Section 3.2, this scenario involves campers on site camping near Rose Creek (Camper 4) and Vangorda Creek (Camper 5). It also involves individuals who are off site who come on site to trap small animals and gather berries either near Faro mine site (Camper 1) or near Vangorda mine site (Camper 3). In this scenario, it was assumed that individuals would still spend 1.5 months of the year on site but would take fish and wild game off the site and consume every other day for a year.

The predicted intakes of the COPC for the various receptors are provided on Table 4.5-7 for the “Remediation” Future 2 scenario. A review of the table indicates that the intakes of COPC are lower than for the “Existing” scenario for Camper 1 with the exception of zinc (Table 4.5-1). The intakes are also lower than those predicted for the “No Intervention” Future 1 scenario, with the exception of zinc. Not surprisingly, the predicted intakes for the “Remediation” scenario are lower than those predicted “No Intervention” Future 3 scenario. With the exception of zinc exposures, the Camper 5 adult, child and toddler (located near Vangorda Creek) are the most exposed individuals (i.e. have the highest intakes). For zinc exposures, Camper 4 receptors (located near Rose Creek) are the most exposed individuals. The intake of fish from Rose Creek represents a higher exposure to Camper 4 than for Camper 5 who gets fish from Vangorda Creek.

Table 4.5-8 provides the percentage breakdown by pathway for the “Remediation” Future 2 scenario. Consumption of fish from the site and moose hunted on site are still the greatest exposure pathways in this scenario. Soil ingestion for a Camper 1 toddler is still the dominant pathway of exposure to lead.

TABLE 4.5-7
HUMAN INTAKES OF COPC FOR “REMEDIATION” SCENARIO – FUTURE 2

Intake by Pathway															
Arsenic mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	2.72x10 ⁻⁶	1.21x10 ⁻⁵	5.63x10 ⁻⁸	5.24x10 ⁻⁸	1.60x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.65x10 ⁻⁸	1.22x10 ⁻⁶	5.13x10 ⁻⁷	3.46x10 ⁻⁷	0.00	1.23x10 ⁻⁵	3.49x10 ⁻⁵	3.39x10 ⁻⁷
Camper 1 - Child	1.82x10 ⁻⁶	9.84x10 ⁻⁶	4.02x10 ⁻⁸	3.74x10 ⁻⁸	1.14x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.18x10 ⁻⁸	8.72x10 ⁻⁷	3.66x10 ⁻⁷	1.97x10 ⁻⁷	0.00	1.54x10 ⁻⁶	1.87x10 ⁻⁵	2.58x10 ⁻⁷
Camper 1 - Adult	1.59x10 ⁻⁶	5.65x10 ⁻⁶	2.53x10 ⁻⁸	2.35x10 ⁻⁸	7.17x10 ⁻⁹	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.43x10 ⁻⁹	5.48x10 ⁻⁷	2.30x10 ⁻⁷	8.41x10 ⁻⁸	4.51x10 ⁻⁸	7.18x10 ⁻⁷	1.14x10 ⁻⁵	1.97x10 ⁻⁷
Camper 3 - Toddler	2.72x10 ⁻⁶	1.21x10 ⁻⁵	2.65x10 ⁻⁸	3.48x10 ⁻⁸	1.60x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.65x10 ⁻⁸	4.97x10 ⁻⁷	5.13x10 ⁻⁷	6.84x10 ⁻⁷	0.00	5.33x10 ⁻⁶	2.75x10 ⁻⁵	1.47x10 ⁻⁷
Camper 3 - Child	1.82x10 ⁻⁶	9.84x10 ⁻⁶	1.89x10 ⁻⁸	2.48x10 ⁻⁸	1.14x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.18x10 ⁻⁸	3.55x10 ⁻⁷	3.66x10 ⁻⁷	3.89x10 ⁻⁷	0.00	6.68x10 ⁻⁷	1.75x10 ⁻⁵	1.12x10 ⁻⁷
Camper 3 - Adult	1.59x10 ⁻⁶	5.65x10 ⁻⁶	1.19x10 ⁻⁸	1.56x10 ⁻⁸	7.17x10 ⁻⁹	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.43x10 ⁻⁹	2.23x10 ⁻⁷	2.30x10 ⁻⁷	1.66x10 ⁻⁷	4.51x10 ⁻⁸	3.11x10 ⁻⁷	1.08x10 ⁻⁵	8.52x10 ⁻⁸
Camper 4 - Toddler	7.08x10 ⁻⁶	3.15x10 ⁻⁵	5.63x10 ⁻⁸	5.24x10 ⁻⁸	4.49x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.65x10 ⁻⁸	1.22x10 ⁻⁶	1.34x10 ⁻⁶	3.46x10 ⁻⁷	0.00	1.22x10 ⁻⁵	5.95x10 ⁻⁵	3.37x10 ⁻⁷
Camper 4 - Child	4.73x10 ⁻⁶	2.56x10 ⁻⁵	4.02x10 ⁻⁸	3.74x10 ⁻⁸	3.20x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.18x10 ⁻⁸	8.72x10 ⁻⁷	9.54x10 ⁻⁷	1.97x10 ⁻⁷	0.00	1.53x10 ⁻⁶	3.80x10 ⁻⁵	2.56x10 ⁻⁷
Camper 4 - Adult	4.13x10 ⁻⁶	1.47x10 ⁻⁵	2.53x10 ⁻⁸	2.35x10 ⁻⁸	2.01x10 ⁻⁸	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.43x10 ⁻⁹	5.48x10 ⁻⁷	6.00x10 ⁻⁷	8.41x10 ⁻⁸	4.51x10 ⁻⁸	7.14x10 ⁻⁷	2.34x10 ⁻⁵	1.96x10 ⁻⁷
Camper 5 - Toddler	1.82x10 ⁻⁵	8.10x10 ⁻⁵	2.65x10 ⁻⁸	3.48x10 ⁻⁸	5.00x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.65x10 ⁻⁸	4.97x10 ⁻⁷	3.44x10 ⁻⁶	6.84x10 ⁻⁷	0.00	8.47x10 ⁻⁶	1.18x10 ⁻⁴	2.33x10 ⁻⁷
Camper 5 - Child	1.22x10 ⁻⁵	6.58x10 ⁻⁵	1.89x10 ⁻⁸	2.48x10 ⁻⁸	3.57x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.18x10 ⁻⁸	3.55x10 ⁻⁷	2.45x10 ⁻⁶	3.89x10 ⁻⁷	0.00	1.06x10 ⁻⁶	8.63x10 ⁻⁵	1.77x10 ⁻⁷
Camper 5 - Adult	1.06x10 ⁻⁵	3.78x10 ⁻⁵	1.19x10 ⁻⁸	1.56x10 ⁻⁸	2.24x10 ⁻⁸	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.43x10 ⁻⁹	2.23x10 ⁻⁷	1.54x10 ⁻⁶	1.66x10 ⁻⁷	4.51x10 ⁻⁸	4.94x10 ⁻⁷	5.35x10 ⁻⁵	1.35x10 ⁻⁷

Cadmium mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	2.28x10 ⁻⁶	3.52x10 ⁻⁵	1.76x10 ⁻⁸	2.97x10 ⁻⁹	1.86x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.69x10 ⁻⁹	1.56x10 ⁻⁶	2.02x10 ⁻⁶	5.78x10 ⁻⁷	0.00	1.16x10 ⁻⁶	9.11x10 ⁻⁵	3.20x10 ⁻⁸
Camper 1 - Child	1.52x10 ⁻⁶	2.86x10 ⁻⁵	1.26x10 ⁻⁸	2.12x10 ⁻⁹	1.33x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.21x10 ⁻⁹	1.11x10 ⁻⁶	1.44x10 ⁻⁶	3.29x10 ⁻⁷	0.00	1.45x10 ⁻⁷	6.76x10 ⁻⁵	2.43x10 ⁻⁸
Camper 1 - Adult	1.33x10 ⁻⁶	1.64x10 ⁻⁵	7.90x10 ⁻⁹	1.33x10 ⁻⁹	8.36x10 ⁻⁸	2.09x10 ⁻⁵	6.81x10 ⁻⁷	7.60x10 ⁻¹⁰	6.99x10 ⁻⁷	9.05x10 ⁻⁷	1.40x10 ⁻⁷	2.71x10 ⁻⁸	6.76x10 ⁻⁸	4.13x10 ⁻⁵	1.85x10 ⁻⁸
Camper 3 - Toddler	2.28x10 ⁻⁶	3.52x10 ⁻⁵	1.50x10 ⁻⁸	2.32x10 ⁻⁹	1.86x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.69x10 ⁻⁹	1.34x10 ⁻⁶	2.02x10 ⁻⁶	2.25x10 ⁻⁷	0.00	1.08x10 ⁻⁶	9.04x10 ⁻⁵	2.98x10 ⁻⁸
Camper 3 - Child	1.52x10 ⁻⁶	2.86x10 ⁻⁵	1.07x10 ⁻⁸	1.65x10 ⁻⁹	1.33x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.21x10 ⁻⁹	9.55x10 ⁻⁷	1.44x10 ⁻⁶	1.28x10 ⁻⁷	0.00	1.36x10 ⁻⁷	6.73x10 ⁻⁵	2.26x10 ⁻⁸
Camper 3 - Adult	1.33x10 ⁻⁶	1.64x10 ⁻⁵	6.72x10 ⁻⁹	1.04x10 ⁻⁹	8.36x10 ⁻⁸	2.09x10 ⁻⁵	6.81x10 ⁻⁷	7.60x10 ⁻¹⁰	6.01x10 ⁻⁷	9.05x10 ⁻⁷	5.47x10 ⁻⁸	2.71x10 ⁻⁸	6.31x10 ⁻⁸	4.11x10 ⁻⁵	1.73x10 ⁻⁸
Camper 4 - Toddler	3.53x10 ⁻⁶	5.46x10 ⁻⁵	1.76x10 ⁻⁸	2.97x10 ⁻⁹	2.25x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.69x10 ⁻⁹	1.56x10 ⁻⁶	3.12x10 ⁻⁶	5.78x10 ⁻⁷	0.00	1.60x10 ⁻⁶	1.13x10 ⁻⁴	4.42x10 ⁻⁸
Camper 4 - Child	2.36x10 ⁻⁶	4.43x10 ⁻⁵	1.26x10 ⁻⁸	2.12x10 ⁻⁹	1.61x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.21x10 ⁻⁹	1.11x10 ⁻⁶	2.23x10 ⁻⁶	3.29x10 ⁻⁷	0.00	2.01x10 ⁻⁷	8.50x10 ⁻⁵	3.36x10 ⁻⁸
Camper 4 - Adult	2.06x10 ⁻⁶	2.55x10 ⁻⁵	7.90x10 ⁻⁹	1.33x10 ⁻⁹	1.01x10 ⁻⁷	2.09x10 ⁻⁵	6.81x10 ⁻⁷	7.60x10 ⁻¹⁰	6.99x10 ⁻⁷	1.40x10 ⁻⁶	1.40x10 ⁻⁷	2.71x10 ⁻⁸	9.36x10 ⁻⁸	5.16x10 ⁻⁵	2.56x10 ⁻⁸
Camper 5 - Toddler	6.81x10 ⁻⁶	1.05x10 ⁻⁴	1.50x10 ⁻⁸	2.32x10 ⁻⁹	4.46x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.69x10 ⁻⁹	1.34x10 ⁻⁶	6.03x10 ⁻⁶	2.25x10 ⁻⁷	0.00	7.89x10 ⁻⁷	1.69x10 ⁻⁴	2.18x10 ⁻⁸
Camper 5 - Child	4.55x10 ⁻⁶	8.55x10 ⁻⁵	1.07x10 ⁻⁸	1.65x10 ⁻⁹	3.18x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.21x10 ⁻⁹	9.55x10 ⁻⁷	4.30x10 ⁻⁶	1.28x10 ⁻⁷	0.00	9.89x10 ⁻⁸	1.30x10 ⁻⁴	1.65x10 ⁻⁸
Camper 5 - Adult	3.97x10 ⁻⁶	4.91x10 ⁻⁵	6.72x10 ⁻⁹	1.04x10 ⁻⁹	2.00x10 ⁻⁷	2.09x10 ⁻⁵	6.81x10 ⁻⁷	7.60x10 ⁻¹⁰	6.01x10 ⁻⁷	2.70x10 ⁻⁶	5.47x10 ⁻⁸	2.71x10 ⁻⁸	4.60x10 ⁻⁸	7.83x10 ⁻⁵	1.26x10 ⁻⁸

TABLE 4.5-7 (Cont'd)
HUMAN INTAKES OF COPC FOR “REMEDIATION” SCENARIO – FUTURE 2

Copper mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	2.28x10 ⁻⁵	1.12x10 ⁻³	1.17x10 ⁻⁶	1.41x10 ⁻⁶	2.25x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.63x10 ⁻⁶	2.34x10 ⁻⁶	1.82x10 ⁻⁶	1.85x10 ⁻⁵	0.00	3.49x10 ⁻⁵	4.59x10 ⁻³	3.00x10 ⁻⁶
Camper 1 - Child	1.52x10 ⁻⁵	9.08x10 ⁻⁴	8.35x10 ⁻⁷	1.00x10 ⁻⁶	1.61x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.17x10 ⁻⁶	1.67x10 ⁻⁶	1.30x10 ⁻⁶	1.05x10 ⁻⁵	0.00	4.37x10 ⁻⁶	3.36x10 ⁻³	2.28x10 ⁻⁶
Camper 1 - Adult	1.33x10 ⁻⁵	5.22x10 ⁻⁴	5.25x10 ⁻⁷	6.31x10 ⁻⁷	1.01x10 ⁻⁶	1.31x10 ⁻³	2.08x10 ⁻⁴	7.33x10 ⁻⁷	1.05x10 ⁻⁶	8.17x10 ⁻⁷	4.50x10 ⁻⁶	5.86x10 ⁻⁶	2.03x10 ⁻⁶	2.07x10 ⁻³	1.74x10 ⁻⁶
Camper 3 - Toddler	2.28x10 ⁻⁵	1.12x10 ⁻³	7.59x10 ⁻⁷	9.33x10 ⁻⁷	2.25x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.63x10 ⁻⁶	1.69x10 ⁻⁶	1.82x10 ⁻⁶	1.72x10 ⁻⁵	0.00	1.58x10 ⁻⁵	4.57x10 ⁻³	1.36x10 ⁻⁶
Camper 3 - Child	1.52x10 ⁻⁵	9.08x10 ⁻⁴	5.42x10 ⁻⁷	6.66x10 ⁻⁷	1.61x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.17x10 ⁻⁶	1.21x10 ⁻⁶	1.30x10 ⁻⁶	9.78x10 ⁻⁶	0.00	1.98x10 ⁻⁶	3.36x10 ⁻³	1.03x10 ⁻⁶
Camper 3 - Adult	1.33x10 ⁻⁵	5.22x10 ⁻⁴	3.41x10 ⁻⁷	4.19x10 ⁻⁷	1.01x10 ⁻⁶	1.31x10 ⁻³	2.08x10 ⁻⁴	7.33x10 ⁻⁷	7.60x10 ⁻⁷	8.17x10 ⁻⁷	4.17x10 ⁻⁶	5.86x10 ⁻⁶	9.23x10 ⁻⁷	2.07x10 ⁻³	7.90x10 ⁻⁷
Camper 4 - Toddler	3.60x10 ⁻⁵	1.76x10 ⁻³	1.17x10 ⁻⁶	1.41x10 ⁻⁶	2.97x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.63x10 ⁻⁶	2.34x10 ⁻⁶	2.87x10 ⁻⁶	1.85x10 ⁻⁵	0.00	6.05x10 ⁻⁵	5.28x10 ⁻³	5.21x10 ⁻⁶
Camper 4 - Child	2.41x10 ⁻⁵	1.43x10 ⁻³	8.35x10 ⁻⁷	1.00x10 ⁻⁶	2.12x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.17x10 ⁻⁶	1.67x10 ⁻⁶	2.05x10 ⁻⁶	1.05x10 ⁻⁵	0.00	7.58x10 ⁻⁶	3.90x10 ⁻³	3.95x10 ⁻⁶
Camper 4 - Adult	2.10x10 ⁻⁵	8.24x10 ⁻⁴	5.25x10 ⁻⁷	6.31x10 ⁻⁷	1.33x10 ⁻⁶	1.31x10 ⁻³	2.08x10 ⁻⁴	7.33x10 ⁻⁷	1.05x10 ⁻⁶	1.29x10 ⁻⁶	4.50x10 ⁻⁶	5.86x10 ⁻⁶	3.53x10 ⁻⁶	2.38x10 ⁻³	3.02x10 ⁻⁶
Camper 5 - Toddler	1.23x10 ⁻⁵	6.05x10 ⁻⁴	7.59x10 ⁻⁷	9.33x10 ⁻⁷	1.56x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.63x10 ⁻⁶	1.69x10 ⁻⁶	9.86x10 ⁻⁷	1.72x10 ⁻⁵	0.00	2.12x10 ⁻⁵	4.05x10 ⁻³	1.83x10 ⁻⁶
Camper 5 - Child	8.26x10 ⁻⁶	4.92x10 ⁻⁴	5.42x10 ⁻⁷	6.66x10 ⁻⁷	1.11x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.17x10 ⁻⁶	1.21x10 ⁻⁶	7.03x10 ⁻⁷	9.78x10 ⁻⁶	0.00	2.66x10 ⁻⁶	2.93x10 ⁻³	1.39x10 ⁻⁶
Camper 5 - Adult	7.20x10 ⁻⁶	2.83x10 ⁻⁴	3.41x10 ⁻⁷	4.19x10 ⁻⁷	7.00x10 ⁻⁷	1.31x10 ⁻³	2.08x10 ⁻⁴	7.33x10 ⁻⁷	7.60x10 ⁻⁷	4.42x10 ⁻⁷	4.17x10 ⁻⁶	5.86x10 ⁻⁶	1.24x10 ⁻⁶	1.82x10 ⁻³	1.06x10 ⁻⁶

Lead mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	1.93x10 ⁻⁵	9.42x10 ⁻⁵	1.96x10 ⁻⁴	2.25x10 ⁻⁴	1.06x10 ⁻⁶	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.24x10 ⁻⁸	9.81x10 ⁻⁶	1.74x10 ⁻⁷	3.45x10 ⁻⁶	0.00	5.55x10 ⁻⁴	1.15x10 ⁻³	2.87x10 ⁻⁶
Camper 1 - Child	1.29x10 ⁻⁵	7.65x10 ⁻⁵	1.40x10 ⁻⁴	1.60x10 ⁻⁴	7.54x10 ⁻⁷	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.88x10 ⁻⁹	7.00x10 ⁻⁶	1.24x10 ⁻⁷	1.96x10 ⁻⁶	0.00	6.96x10 ⁻⁵	4.98x10 ⁻⁴	2.18x10 ⁻⁶
Camper 1 - Adult	1.12x10 ⁻⁵	4.39x10 ⁻⁵	8.82x10 ⁻⁵	1.01x10 ⁻⁴	4.74x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.58x10 ⁻⁹	4.40x10 ⁻⁶	7.80x10 ⁻⁸	8.39x10 ⁻⁷	2.34x10 ⁻⁶	3.24x10 ⁻⁵	3.03x10 ⁻⁴	1.66x10 ⁻⁶
Camper 3 - Toddler	1.93x10 ⁻⁵	9.42x10 ⁻⁵	2.38x10 ⁻⁵	2.85x10 ⁻⁵	1.06x10 ⁻⁶	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.24x10 ⁻⁸	1.17x10 ⁻⁶	1.74x10 ⁻⁷	1.16x10 ⁻⁶	0.00	8.86x10 ⁻⁵	2.99x10 ⁻⁴	4.58x10 ⁻⁷
Camper 3 - Child	1.29x10 ⁻⁵	7.65x10 ⁻⁵	1.70x10 ⁻⁵	2.03x10 ⁻⁵	7.54x10 ⁻⁷	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.88x10 ⁻⁹	8.31x10 ⁻⁷	1.24x10 ⁻⁷	6.63x10 ⁻⁷	0.00	1.11x10 ⁻⁵	1.69x10 ⁻⁴	3.48x10 ⁻⁷
Camper 3 - Adult	1.12x10 ⁻⁵	4.39x10 ⁻⁵	1.07x10 ⁻⁵	1.28x10 ⁻⁵	4.74x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.58x10 ⁻⁹	5.23x10 ⁻⁷	7.80x10 ⁻⁸	2.83x10 ⁻⁷	2.34x10 ⁻⁶	5.17x10 ⁻⁶	1.06x10 ⁻⁴	2.66x10 ⁻⁷
Camper 4 - Toddler	1.94x10 ⁻⁵	9.50x10 ⁻⁵	1.96x10 ⁻⁴	2.25x10 ⁻⁴	2.63x10 ⁻⁶	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.24x10 ⁻⁸	9.81x10 ⁻⁶	1.75x10 ⁻⁷	3.45x10 ⁻⁶	0.00	1.22x10 ⁻³	1.81x10 ⁻³	6.31x10 ⁻⁶
Camper 4 - Child	1.30x10 ⁻⁵	7.72x10 ⁻⁵	1.40x10 ⁻⁴	1.60x10 ⁻⁴	1.88x10 ⁻⁶	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.88x10 ⁻⁹	7.00x10 ⁻⁶	1.25x10 ⁻⁷	1.96x10 ⁻⁶	0.00	1.53x10 ⁻⁴	5.84x10 ⁻⁴	4.79x10 ⁻⁶
Camper 4 - Adult	1.13x10 ⁻⁵	4.43x10 ⁻⁵	8.82x10 ⁻⁵	1.01x10 ⁻⁴	1.18x10 ⁻⁶	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.58x10 ⁻⁹	4.40x10 ⁻⁶	7.88x10 ⁻⁸	8.39x10 ⁻⁷	2.34x10 ⁻⁶	7.12x10 ⁻⁵	3.43x10 ⁻⁴	3.66x10 ⁻⁶
Camper 5 - Toddler	4.11x10 ⁻⁵	2.01x10 ⁻⁴	2.38x10 ⁻⁵	2.85x10 ⁻⁵	2.01x10 ⁻⁶	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.24x10 ⁻⁸	1.17x10 ⁻⁶	3.71x10 ⁻⁷	1.16x10 ⁻⁶	0.00	1.50x10 ⁻⁴	4.90x10 ⁻⁴	7.75x10 ⁻⁷
Camper 5 - Child	2.75x10 ⁻⁵	1.63x10 ⁻⁴	1.70x10 ⁻⁵	2.03x10 ⁻⁵	1.43x10 ⁻⁶	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.88x10 ⁻⁹	8.31x10 ⁻⁷	2.65x10 ⁻⁷	6.63x10 ⁻⁷	0.00	1.88x10 ⁻⁵	2.79x10 ⁻⁴	5.89x10 ⁻⁷
Camper 5 - Adult	2.40x10 ⁻⁵	9.38x10 ⁻⁵	1.07x10 ⁻⁵	1.28x10 ⁻⁵	9.01x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.58x10 ⁻⁹	5.23x10 ⁻⁷	1.67x10 ⁻⁷	2.83x10 ⁻⁷	2.34x10 ⁻⁶	8.75x10 ⁻⁶	1.73x10 ⁻⁴	4.50x10 ⁻⁷

TABLE 4.5-7 (Cont'd)
HUMAN INTAKES OF COPC FOR “REMEDIATION” SCENARIO – FUTURE 2

Manganese mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	6.56x10 ⁻⁵	9.25x10 ⁻⁴	1.62x10 ⁻⁶	3.83x10 ⁻⁶	3.75x10 ⁻⁶	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.04x10 ⁻⁶	4.77x10 ⁻⁶	4.25x10 ⁻⁷	5.99x10 ⁻⁴	0.00	3.24x10 ⁻⁴	2.66x10 ⁻³	2.79x10 ⁻⁵
Camper 1 - Child	4.39x10 ⁻⁵	7.51x10 ⁻⁴	1.15x10 ⁻⁶	2.73x10 ⁻⁶	2.68x10 ⁻⁶	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.03x10 ⁻⁶	3.41x10 ⁻⁶	3.03x10 ⁻⁷	3.41x10 ⁻⁴	0.00	4.06x10 ⁻⁵	1.71x10 ⁻³	2.12x10 ⁻⁵
Camper 1 - Adult	3.83x10 ⁻⁵	4.32x10 ⁻⁴	7.26x10 ⁻⁷	1.72x10 ⁻⁶	1.68x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.16x10 ⁻⁶	2.14x10 ⁻⁶	1.91x10 ⁻⁷	1.46x10 ⁻⁴	6.11x10 ⁻⁴	1.89x10 ⁻⁵	1.58x10 ⁻³	1.62x10 ⁻⁵
Camper 3 - Toddler	6.56x10 ⁻⁵	9.25x10 ⁻⁴	4.09x10 ⁻⁶	5.26x10 ⁻⁶	3.75x10 ⁻⁶	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.04x10 ⁻⁶	1.73x10 ⁻⁵	4.25x10 ⁻⁷	2.10x10 ⁻⁴	0.00	7.83x10 ⁻⁴	2.75x10 ⁻³	6.75x10 ⁻⁵
Camper 3 - Child	4.39x10 ⁻⁵	7.51x10 ⁻⁴	2.92x10 ⁻⁶	3.75x10 ⁻⁶	2.68x10 ⁻⁶	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.03x10 ⁻⁶	1.23x10 ⁻⁵	3.03x10 ⁻⁷	1.20x10 ⁻⁴	0.00	9.82x10 ⁻⁵	1.56x10 ⁻³	5.12x10 ⁻⁵
Camper 3 - Adult	3.83x10 ⁻⁵	4.32x10 ⁻⁴	1.84x10 ⁻⁶	2.36x10 ⁻⁶	1.68x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.16x10 ⁻⁶	7.75x10 ⁻⁶	1.91x10 ⁻⁷	5.12x10 ⁻⁵	6.11x10 ⁻⁴	4.57x10 ⁻⁵	1.52x10 ⁻³	3.91x10 ⁻⁵
Camper 4 - Toddler	1.70x10 ⁻⁴	2.40x10 ⁻³	1.62x10 ⁻⁶	3.83x10 ⁻⁶	1.57x10 ⁻⁵	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.04x10 ⁻⁶	4.77x10 ⁻⁶	1.10x10 ⁻⁶	5.99x10 ⁻⁴	0.00	2.22x10 ⁻⁴	4.16x10 ⁻³	1.92x10 ⁻⁵
Camper 4 - Child	1.14x10 ⁻⁴	1.95x10 ⁻³	1.15x10 ⁻⁶	2.73x10 ⁻⁶	1.12x10 ⁻⁵	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.03x10 ⁻⁶	3.41x10 ⁻⁶	7.87x10 ⁻⁷	3.41x10 ⁻⁴	0.00	2.79x10 ⁻⁵	2.98x10 ⁻³	1.45x10 ⁻⁵
Camper 4 - Adult	9.94x10 ⁻⁵	1.12x10 ⁻³	7.26x10 ⁻⁷	1.72x10 ⁻⁶	7.05x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.16x10 ⁻⁶	2.14x10 ⁻⁶	4.95x10 ⁻⁷	1.46x10 ⁻⁴	6.11x10 ⁻⁴	1.30x10 ⁻⁵	2.33x10 ⁻³	1.11x10 ⁻⁵
Camper 5 - Toddler	1.09x10 ⁻⁴	1.53x10 ⁻³	4.09x10 ⁻⁶	5.26x10 ⁻⁶	3.82x10 ⁻⁶	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.04x10 ⁻⁶	1.73x10 ⁻⁵	7.03x10 ⁻⁷	2.10x10 ⁻⁴	0.00	8.39x10 ⁻⁴	3.45x10 ⁻³	7.23x10 ⁻⁵
Camper 5 - Child	7.26x10 ⁻⁵	1.24x10 ⁻³	2.92x10 ⁻⁶	3.75x10 ⁻⁶	2.73x10 ⁻⁶	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.03x10 ⁻⁶	1.23x10 ⁻⁵	5.02x10 ⁻⁷	1.20x10 ⁻⁴	0.00	1.05x10 ⁻⁴	2.09x10 ⁻³	5.49x10 ⁻⁵
Camper 5 - Adult	6.34x10 ⁻⁵	7.14x10 ⁻⁴	1.84x10 ⁻⁶	2.36x10 ⁻⁶	1.71x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.16x10 ⁻⁶	7.75x10 ⁻⁶	3.15x10 ⁻⁷	5.12x10 ⁻⁵	6.11x10 ⁻⁴	4.89x10 ⁻⁵	1.83x10 ⁻³	4.19x10 ⁻⁵

Nickel mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	4.77x10 ⁻⁶	1.65x10 ⁻⁵	2.44x10 ⁻⁷	2.08x10 ⁻⁷	3.09x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.38x10 ⁻⁷	5.75x10 ⁻⁶	3.96x10 ⁻⁷	4.82x10 ⁻⁶	0.00	6.94x10 ⁻⁶	6.10x10 ⁻⁵	2.09x10 ⁻⁶
Camper 1 - Child	3.19x10 ⁻⁶	1.34x10 ⁻⁵	1.74x10 ⁻⁷	1.48x10 ⁻⁷	2.20x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.12x10 ⁻⁷	4.11x10 ⁻⁶	2.83x10 ⁻⁷	2.74x10 ⁻⁶	0.00	8.70x10 ⁻⁷	4.02x10 ⁻⁵	1.59x10 ⁻⁶
Camper 1 - Adult	2.79x10 ⁻⁶	7.69x10 ⁻⁶	1.10x10 ⁻⁷	9.33x10 ⁻⁸	1.39x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	1.96x10 ⁻⁷	2.58x10 ⁻⁶	1.78x10 ⁻⁷	1.17x10 ⁻⁶	9.92x10 ⁻⁷	4.05x10 ⁻⁷	2.56x10 ⁻⁵	1.21x10 ⁻⁶
Camper 3 - Toddler	4.77x10 ⁻⁶	1.65x10 ⁻⁵	2.80x10 ⁻⁷	3.27x10 ⁻⁷	3.09x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.38x10 ⁻⁷	5.87x10 ⁻⁶	3.96x10 ⁻⁷	5.82x10 ⁻⁶	0.00	1.07x10 ⁻⁵	6.60x10 ⁻⁵	3.22x10 ⁻⁶
Camper 3 - Child	3.19x10 ⁻⁶	1.34x10 ⁻⁵	2.00x10 ⁻⁷	2.33x10 ⁻⁷	2.20x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.12x10 ⁻⁷	4.19x10 ⁻⁶	2.83x10 ⁻⁷	3.31x10 ⁻⁶	0.00	1.34x10 ⁻⁶	4.14x10 ⁻⁵	2.45x10 ⁻⁶
Camper 3 - Adult	2.79x10 ⁻⁶	7.69x10 ⁻⁶	1.25x10 ⁻⁷	1.47x10 ⁻⁷	1.39x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	1.96x10 ⁻⁷	2.64x10 ⁻⁶	1.78x10 ⁻⁷	1.41x10 ⁻⁶	9.92x10 ⁻⁷	6.24x10 ⁻⁷	2.62x10 ⁻⁵	1.87x10 ⁻⁶
Camper 4 - Toddler	1.77x10 ⁻⁵	6.09x10 ⁻⁵	2.44x10 ⁻⁷	2.08x10 ⁻⁷	4.45x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.38x10 ⁻⁷	5.75x10 ⁻⁶	1.47x10 ⁻⁶	4.82x10 ⁻⁶	0.00	8.11x10 ⁻⁶	1.21x10 ⁻⁴	2.45x10 ⁻⁶
Camper 4 - Child	1.18x10 ⁻⁵	4.95x10 ⁻⁵	1.74x10 ⁻⁷	1.48x10 ⁻⁷	3.17x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.12x10 ⁻⁷	4.11x10 ⁻⁶	1.05x10 ⁻⁶	2.74x10 ⁻⁶	0.00	1.02x10 ⁻⁶	8.59x10 ⁻⁵	1.86x10 ⁻⁶
Camper 4 - Adult	1.03x10 ⁻⁵	2.84x10 ⁻⁵	1.10x10 ⁻⁷	9.33x10 ⁻⁸	2.00x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	1.96x10 ⁻⁷	2.58x10 ⁻⁶	6.58x10 ⁻⁷	1.17x10 ⁻⁶	9.92x10 ⁻⁷	4.73x10 ⁻⁷	5.45x10 ⁻⁵	1.42x10 ⁻⁶
Camper 5 - Toddler	4.64x10 ⁻⁵	1.60x10 ⁻⁴	2.80x10 ⁻⁷	3.27x10 ⁻⁷	8.26x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.38x10 ⁻⁷	5.87x10 ⁻⁶	3.86x10 ⁻⁶	5.82x10 ⁻⁶	0.00	1.46x10 ⁻⁵	2.59x10 ⁻⁴	4.39x10 ⁻⁶
Camper 5 - Child	3.10x10 ⁻⁵	1.30x10 ⁻⁴	2.00x10 ⁻⁷	2.33x10 ⁻⁷	5.89x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.12x10 ⁻⁷	4.19x10 ⁻⁶	2.75x10 ⁻⁶	3.31x10 ⁻⁶	0.00	1.83x10 ⁻⁶	1.89x10 ⁻⁴	3.33x10 ⁻⁶
Camper 5 - Adult	2.71x10 ⁻⁵	7.48x10 ⁻⁵	1.25x10 ⁻⁷	1.47x10 ⁻⁷	3.71x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	1.96x10 ⁻⁷	2.64x10 ⁻⁶	1.73x10 ⁻⁶	1.41x10 ⁻⁶	9.92x10 ⁻⁷	8.50x10 ⁻⁷	1.20x10 ⁻⁴	2.55x10 ⁻⁶

TABLE 4.5-7 (Cont'd)
HUMAN INTAKES OF COPC FOR “REMEDIATION” SCENARIO – FUTURE 2

Silver mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	1.34x10 ⁻⁸	3.34x10 ⁻⁷	6.11x10 ⁻⁹	6.17x10 ⁻⁹	2.82x10 ⁻⁹	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.86x10 ⁻⁹	1.58x10 ⁻⁷	1.55x10 ⁻⁹	9.93x10 ⁻⁸	0.00	6.06x10 ⁻⁷	2.55x10 ⁻⁴	1.31x10 ⁻⁷
Camper 1 - Child	8.97x10 ⁻⁹	2.71x10 ⁻⁷	4.36x10 ⁻⁹	4.40x10 ⁻⁹	2.01x10 ⁻⁹	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.47x10 ⁻⁹	1.12x10 ⁻⁷	1.11x10 ⁻⁹	5.66x10 ⁻⁸	0.00	7.60x10 ⁻⁸	1.82x10 ⁻⁴	9.91x10 ⁻⁸
Camper 1 - Adult	7.83x10 ⁻⁹	1.56x10 ⁻⁷	2.74x10 ⁻⁹	2.77x10 ⁻⁹	1.27x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.18x10 ⁻⁹	7.07x10 ⁻⁸	6.96x10 ⁻¹⁰	2.41x10 ⁻⁸	9.02x10 ⁻⁹	3.54x10 ⁻⁸	1.14x10 ⁻⁴	7.57x10 ⁻⁸
Camper 3 - Toddler	1.34x10 ⁻⁸	3.34x10 ⁻⁷	4.42x10 ⁻⁹	4.17x10 ⁻⁹	2.82x10 ⁻⁹	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.86x10 ⁻⁹	1.29x10 ⁻⁷	1.55x10 ⁻⁹	4.36x10 ⁻⁸	0.00	6.06x10 ⁻⁷	2.55x10 ⁻⁴	1.31x10 ⁻⁷
Camper 3 - Child	8.97x10 ⁻⁹	2.71x10 ⁻⁷	3.16x10 ⁻⁹	2.98x10 ⁻⁹	2.01x10 ⁻⁹	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.47x10 ⁻⁹	9.21x10 ⁻⁸	1.11x10 ⁻⁹	2.48x10 ⁻⁸	0.00	7.60x10 ⁻⁸	1.82x10 ⁻⁴	9.91x10 ⁻⁸
Camper 3 - Adult	7.83x10 ⁻⁹	1.56x10 ⁻⁷	1.99x10 ⁻⁹	1.87x10 ⁻⁹	1.27x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.18x10 ⁻⁹	5.79x10 ⁻⁸	6.96x10 ⁻¹⁰	1.06x10 ⁻⁸	9.02x10 ⁻⁹	3.54x10 ⁻⁸	1.14x10 ⁻⁴	7.57x10 ⁻⁸
Camper 4 - Toddler	4.86x10 ⁻⁷	1.21x10 ⁻⁵	6.11x10 ⁻⁹	6.17x10 ⁻⁹	1.05x10 ⁻⁸	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.86x10 ⁻⁹	1.58x10 ⁻⁷	5.62x10 ⁻⁸	9.93x10 ⁻⁸	0.00	1.43x10 ⁻⁶	2.69x10 ⁻⁴	3.09x10 ⁻⁷
Camper 4 - Child	3.25x10 ⁻⁷	9.83x10 ⁻⁶	4.36x10 ⁻⁹	4.40x10 ⁻⁹	7.48x10 ⁻⁹	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.47x10 ⁻⁹	1.12x10 ⁻⁷	4.01x10 ⁻⁸	5.66x10 ⁻⁸	0.00	1.80x10 ⁻⁷	1.92x10 ⁻⁴	2.34x10 ⁻⁷
Camper 4 - Adult	2.84x10 ⁻⁷	5.65x10 ⁻⁶	2.74x10 ⁻⁹	2.77x10 ⁻⁹	4.70x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.18x10 ⁻⁹	7.07x10 ⁻⁸	2.52x10 ⁻⁸	2.41x10 ⁻⁸	9.02x10 ⁻⁹	8.36x10 ⁻⁸	1.20x10 ⁻⁴	1.79x10 ⁻⁷
Camper 5 - Toddler	1.77x10 ⁻⁶	4.42x10 ⁻⁵	4.42x10 ⁻⁹	4.17x10 ⁻⁹	3.40x10 ⁻⁸	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.86x10 ⁻⁹	1.29x10 ⁻⁷	2.05x10 ⁻⁷	4.36x10 ⁻⁸	0.00	6.06x10 ⁻⁷	3.01x10 ⁻⁴	1.31x10 ⁻⁷
Camper 5 - Child	1.19x10 ⁻⁶	3.59x10 ⁻⁵	3.16x10 ⁻⁹	2.98x10 ⁻⁹	2.42x10 ⁻⁸	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.47x10 ⁻⁹	9.21x10 ⁻⁸	1.46x10 ⁻⁷	2.48x10 ⁻⁸	0.00	7.60x10 ⁻⁸	2.19x10 ⁻⁴	9.91x10 ⁻⁸
Camper 5 - Adult	1.04x10 ⁻⁶	2.06x10 ⁻⁵	1.99x10 ⁻⁹	1.87x10 ⁻⁹	1.52x10 ⁻⁸	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.18x10 ⁻⁹	5.79x10 ⁻⁸	9.21x10 ⁻⁸	1.06x10 ⁻⁸	9.02x10 ⁻⁹	3.54x10 ⁻⁸	1.36x10 ⁻⁴	7.57x10 ⁻⁸

Thallium mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	0.00	0.00	1.77x10 ⁻⁸	6.69x10 ⁻⁸	4.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.79x10 ⁻⁸	0.00	2.21x10 ⁻⁸	0.00	0.00	4.10x10 ⁻⁶	0.00
Camper 1 - Child	0.00	0.00	1.26x10 ⁻⁸	4.78x10 ⁻⁸	3.22x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.99x10 ⁻⁸	0.00	1.26x10 ⁻⁸	0.00	0.00	2.92x10 ⁻⁶	0.00
Camper 1 - Adult	0.00	0.00	7.94x10 ⁻⁹	3.00x10 ⁻⁸	2.03x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.39x10 ⁻⁸	0.00	5.36x10 ⁻⁹	1.62x10 ⁻⁷	0.00	2.00x10 ⁻⁶	0.00
Camper 3 - Toddler	0.00	0.00	4.55x10 ⁻⁹	6.89x10 ⁻⁹	4.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.64x10 ⁻⁸	0.00	4.06x10 ⁻⁸	0.00	0.00	4.04x10 ⁻⁶	0.00
Camper 3 - Child	0.00	0.00	3.25x10 ⁻⁹	4.92x10 ⁻⁹	3.22x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.88x10 ⁻⁸	0.00	2.31x10 ⁻⁸	0.00	0.00	2.88x10 ⁻⁶	0.00
Camper 3 - Adult	0.00	0.00	2.04x10 ⁻⁹	3.09x10 ⁻⁹	2.03x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.33x10 ⁻⁸	0.00	9.88x10 ⁻⁹	1.62x10 ⁻⁷	0.00	1.97x10 ⁻⁶	0.00
Camper 4 - Toddler	0.00	0.00	1.77x10 ⁻⁸	6.69x10 ⁻⁸	3.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.79x10 ⁻⁸	0.00	2.21x10 ⁻⁸	0.00	0.00	4.10x10 ⁻⁶	0.00
Camper 4 - Child	0.00	0.00	1.26x10 ⁻⁸	4.78x10 ⁻⁸	2.51x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.99x10 ⁻⁸	0.00	1.26x10 ⁻⁸	0.00	0.00	2.92x10 ⁻⁶	0.00
Camper 4 - Adult	0.00	0.00	7.94x10 ⁻⁹	3.00x10 ⁻⁸	1.58x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.39x10 ⁻⁸	0.00	5.36x10 ⁻⁹	1.62x10 ⁻⁷	0.00	2.00x10 ⁻⁶	0.00
Camper 5 - Toddler	0.00	0.00	4.55x10 ⁻⁹	6.89x10 ⁻⁹	4.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.64x10 ⁻⁸	0.00	4.06x10 ⁻⁸	0.00	0.00	4.04x10 ⁻⁶	0.00
Camper 5 - Child	0.00	0.00	3.25x10 ⁻⁹	4.92x10 ⁻⁹	3.22x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.88x10 ⁻⁸	0.00	2.31x10 ⁻⁸	0.00	0.00	2.88x10 ⁻⁶	0.00
Camper 5 - Adult	0.00	0.00	2.04x10 ⁻⁹	3.09x10 ⁻⁹	2.03x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.33x10 ⁻⁸	0.00	9.88x10 ⁻⁹	1.62x10 ⁻⁷	0.00	1.97x10 ⁻⁶	0.00

TABLE 4.5-7 (Cont'd)
HUMAN INTAKES OF COPC FOR “REMEDIATION” SCENARIO – FUTURE 2

Tin mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	0.00	0.00	9.23x10 ⁻⁸	8.47x10 ⁻⁸	7.74x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	2.10x10 ⁻⁶	0.00	3.45x10 ⁻⁶	0.00	2.34x10 ⁻⁶	1.33x10 ⁻⁵	2.02x10 ⁻⁷
Camper 1 - Child	0.00	0.00	6.58x10 ⁻⁸	6.05x10 ⁻⁸	5.53x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	1.50x10 ⁻⁶	0.00	1.97x10 ⁻⁶	0.00	2.94x10 ⁻⁷	7.59x10 ⁻⁶	1.53x10 ⁻⁷
Camper 1 - Adult	0.00	0.00	4.14x10 ⁻⁸	3.80x10 ⁻⁸	3.48x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	9.42x10 ⁻⁷	0.00	8.39x10 ⁻⁷	1.80x10 ⁻⁷	1.37x10 ⁻⁷	4.51x10 ⁻⁶	1.17x10 ⁻⁷
Camper 3 - Toddler	0.00	0.00	2.18x10 ⁻⁷	1.58x10 ⁻⁷	7.74x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	4.69x10 ⁻⁶	0.00	2.03x10 ⁻⁷	0.00	3.04x10 ⁻⁶	1.35x10 ⁻⁵	2.62x10 ⁻⁷
Camper 3 - Child	0.00	0.00	1.55x10 ⁻⁷	1.13x10 ⁻⁷	5.53x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	3.35x10 ⁻⁶	0.00	1.16x10 ⁻⁷	0.00	3.81x10 ⁻⁷	7.82x10 ⁻⁶	1.99x10 ⁻⁷
Camper 3 - Adult	0.00	0.00	9.77x10 ⁻⁸	7.09x10 ⁻⁸	3.48x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	2.11x10 ⁻⁶	0.00	4.94x10 ⁻⁸	1.80x10 ⁻⁷	1.78x10 ⁻⁷	5.01x10 ⁻⁶	1.52x10 ⁻⁷
Camper 4 - Toddler	0.00	0.00	9.23x10 ⁻⁸	8.47x10 ⁻⁸	1.81x10 ⁻⁷	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	2.10x10 ⁻⁶	0.00	3.45x10 ⁻⁶	0.00	1.91x10 ⁻⁶	1.29x10 ⁻⁵	1.64x10 ⁻⁷
Camper 4 - Child	0.00	0.00	6.58x10 ⁻⁸	6.05x10 ⁻⁸	1.29x10 ⁻⁷	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	1.50x10 ⁻⁶	0.00	1.97x10 ⁻⁶	0.00	2.39x10 ⁻⁷	7.61x10 ⁻⁶	1.25x10 ⁻⁷
Camper 4 - Adult	0.00	0.00	4.14x10 ⁻⁸	3.80x10 ⁻⁸	8.12x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	9.42x10 ⁻⁷	0.00	8.39x10 ⁻⁷	1.80x10 ⁻⁷	1.11x10 ⁻⁷	4.53x10 ⁻⁶	9.52x10 ⁻⁸
Camper 5 - Toddler	0.00	0.00	2.18x10 ⁻⁷	1.58x10 ⁻⁷	7.74x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	4.69x10 ⁻⁶	0.00	2.03x10 ⁻⁷	0.00	4.73x10 ⁻⁶	1.52x10 ⁻⁵	4.08x10 ⁻⁷
Camper 5 - Child	0.00	0.00	1.55x10 ⁻⁷	1.13x10 ⁻⁷	5.53x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	3.35x10 ⁻⁶	0.00	1.16x10 ⁻⁷	0.00	5.93x10 ⁻⁷	8.03x10 ⁻⁶	3.10x10 ⁻⁷
Camper 5 - Adult	0.00	0.00	9.77x10 ⁻⁸	7.09x10 ⁻⁸	3.48x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	2.11x10 ⁻⁶	0.00	4.94x10 ⁻⁸	1.80x10 ⁻⁷	2.76x10 ⁻⁷	5.11x10 ⁻⁶	2.36x10 ⁻⁷

Zinc mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	4.53x10 ⁻⁵	3.50x10 ⁻³	5.67x10 ⁻⁴	3.50x10 ⁻⁴	3.95x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	5.42x10 ⁻³	2.01x10 ⁻³	1.07x10 ⁻⁴	5.63x10 ⁻⁵	0.00	4.45x10 ⁻⁴	2.10x10 ⁻¹	7.67x10 ⁻⁶
Camper 1 - Child	3.03x10 ⁻⁵	2.85x10 ⁻³	4.04x10 ⁻⁴	2.50x10 ⁻⁴	2.82x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	3.87x10 ⁻³	1.43x10 ⁻³	7.67x10 ⁻⁵	3.20x10 ⁻⁵	0.00	5.58x10 ⁻⁵	1.50x10 ⁻¹	5.83x10 ⁻⁶
Camper 1 - Adult	2.65x10 ⁻⁵	1.64x10 ⁻³	2.54x10 ⁻⁴	1.57x10 ⁻⁴	1.77x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.43x10 ⁻³	9.01x10 ⁻⁴	4.82x10 ⁻⁵	1.37x10 ⁻⁵	3.88x10 ⁻⁵	2.60x10 ⁻⁵	9.41x10 ⁻²	4.45x10 ⁻⁶
Camper 3 - Toddler	4.53x10 ⁻⁵	3.50x10 ⁻³	3.13x10 ⁻⁴	8.26x10 ⁻⁴	3.95x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	5.42x10 ⁻³	5.41x10 ⁻⁴	1.07x10 ⁻⁴	5.29x10 ⁻⁵	0.00	1.98x10 ⁻⁴	2.08x10 ⁻¹	3.42x10 ⁻⁶
Camper 3 - Child	3.03x10 ⁻⁵	2.85x10 ⁻³	2.24x10 ⁻⁴	5.90x10 ⁻⁴	2.82x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	3.87x10 ⁻³	3.86x10 ⁻⁴	7.67x10 ⁻⁵	3.01x10 ⁻⁵	0.00	2.49x10 ⁻⁵	1.49x10 ⁻¹	2.59x10 ⁻⁶
Camper 3 - Adult	2.65x10 ⁻⁵	1.64x10 ⁻³	1.41x10 ⁻⁴	3.71x10 ⁻⁴	1.77x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.43x10 ⁻³	2.43x10 ⁻⁴	4.82x10 ⁻⁵	1.29x10 ⁻⁵	3.88x10 ⁻⁵	1.16x10 ⁻⁵	9.35x10 ⁻²	1.98x10 ⁻⁶
Camper 4 - Toddler	6.02x10 ⁻⁴	4.65x10 ⁻²	5.67x10 ⁻⁴	3.50x10 ⁻⁴	9.91x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	5.42x10 ⁻³	2.01x10 ⁻³	1.43x10 ⁻³	5.63x10 ⁻⁵	0.00	7.48x10 ⁻⁴	2.56x10 ⁻¹	1.29x10 ⁻⁵
Camper 4 - Child	4.03x10 ⁻⁴	3.78x10 ⁻²	4.04x10 ⁻⁴	2.50x10 ⁻⁴	7.08x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	3.87x10 ⁻³	1.43x10 ⁻³	1.02x10 ⁻³	3.20x10 ⁻⁵	0.00	9.38x10 ⁻⁵	1.87x10 ⁻¹	9.79x10 ⁻⁶
Camper 4 - Adult	3.51x10 ⁻⁴	2.17x10 ⁻²	2.54x10 ⁻⁴	1.57x10 ⁻⁴	4.45x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.43x10 ⁻³	9.01x10 ⁻⁴	6.40x10 ⁻⁴	1.37x10 ⁻⁵	3.88x10 ⁻⁵	4.36x10 ⁻⁵	1.15x10 ⁻¹	7.47x10 ⁻⁶
Camper 5 - Toddler	1.66x10 ⁻⁴	1.28x10 ⁻²	3.13x10 ⁻⁴	8.26x10 ⁻⁴	4.97x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	5.42x10 ⁻³	5.41x10 ⁻⁴	3.94x10 ⁻⁴	5.29x10 ⁻⁵	0.00	2.73x10 ⁻⁴	2.18x10 ⁻¹	4.70x10 ⁻⁶
Camper 5 - Child	1.11x10 ⁻⁴	1.04x10 ⁻²	2.24x10 ⁻⁴	5.90x10 ⁻⁴	3.55x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	3.87x10 ⁻³	3.86x10 ⁻⁴	2.81x10 ⁻⁴	3.01x10 ⁻⁵	0.00	3.42x10 ⁻⁵	1.57x10 ⁻¹	3.57x10 ⁻⁶
Camper 5 - Adult	9.69x10 ⁻⁵	5.99x10 ⁻³	1.41x10 ⁻⁴	3.71x10 ⁻⁴	2.23x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.43x10 ⁻³	2.43x10 ⁻⁴	1.77x10 ⁻⁴	1.29x10 ⁻⁵	3.88x10 ⁻⁵	1.59x10 ⁻⁵	9.81x10 ⁻²	2.72x10 ⁻⁶

TABLE 4.5-8
PERCENTAGE BREAKDOWN BY PATHWAY FOR
“REMEDIATION” SCENARIO – FUTURE 2

Percent Intake by Pathway														
Arsenic	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	7.70%	34.33%	0.16%	0.15%	0.05%	10.11%	5.73%	0.05%	3.46%	1.46%	0.98%	n/a	34.87%	0.96%
Camper 1 - Child	9.57%	51.84%	0.21%	0.20%	0.06%	13.41%	7.60%	0.06%	4.59%	1.93%	1.04%	n/a	8.13%	1.36%
Camper 1 - Adult	13.63%	48.60%	0.22%	0.20%	0.06%	13.76%	7.80%	0.06%	4.71%	1.98%	0.72%	0.39%	6.17%	1.69%
Camper 3 - Toddler	9.81%	43.75%	0.10%	0.13%	0.06%	12.88%	7.30%	0.06%	1.80%	1.85%	2.47%	n/a	19.26%	0.53%
Camper 3 - Child	10.32%	55.90%	0.11%	0.14%	0.06%	14.46%	8.20%	0.07%	2.02%	2.08%	2.21%	n/a	3.80%	0.63%
Camper 3 - Adult	14.61%	52.11%	0.11%	0.14%	0.07%	14.75%	8.36%	0.07%	2.06%	2.12%	1.53%	0.42%	2.87%	0.79%
Camper 4 - Toddler	11.82%	52.70%	0.09%	0.09%	0.07%	5.96%	3.38%	0.03%	2.04%	2.23%	0.58%	n/a	20.44%	0.56%
Camper 4 - Child	12.36%	66.95%	0.10%	0.10%	0.08%	6.65%	3.77%	0.03%	2.28%	2.49%	0.51%	n/a	4.01%	0.67%
Camper 4 - Adult	17.48%	62.33%	0.11%	0.10%	0.09%	6.77%	3.84%	0.03%	2.32%	2.54%	0.36%	0.19%	3.02%	0.83%
Camper 5 - Toddler	15.37%	68.53%	0.02%	0.03%	0.04%	3.02%	1.71%	0.01%	0.42%	2.90%	0.58%	n/a	7.16%	0.20%
Camper 5 - Child	14.05%	76.11%	0.02%	0.03%	0.04%	2.94%	1.67%	0.01%	0.41%	2.83%	0.45%	n/a	1.23%	0.20%
Camper 5 - Adult	19.79%	70.57%	0.02%	0.03%	0.04%	2.99%	1.69%	0.01%	0.42%	2.88%	0.31%	0.08%	0.92%	0.25%

Cadmium	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	2.50%	38.64%	0.02%	0.00%	0.20%	51.10%	1.66%	0.00%	1.71%	2.21%	0.63%	n/a	1.27%	0.04%
Camper 1 - Child	2.25%	42.29%	0.02%	0.00%	0.20%	49.13%	1.60%	0.00%	1.64%	2.13%	0.49%	n/a	0.21%	0.04%
Camper 1 - Adult	3.22%	39.80%	0.02%	0.00%	0.20%	50.61%	1.65%	0.00%	1.69%	2.19%	0.34%	0.07%	0.16%	0.04%
Camper 3 - Toddler	2.52%	38.92%	0.02%	0.00%	0.21%	51.47%	1.68%	0.00%	1.48%	2.23%	0.25%	n/a	1.20%	0.03%
Camper 3 - Child	2.26%	42.53%	0.02%	0.00%	0.20%	49.40%	1.61%	0.00%	1.42%	2.14%	0.19%	n/a	0.20%	0.03%
Camper 3 - Adult	3.23%	39.99%	0.02%	0.00%	0.20%	50.84%	1.66%	0.00%	1.46%	2.20%	0.13%	0.07%	0.15%	0.04%
Camper 4 - Toddler	3.11%	48.14%	0.02%	0.00%	0.20%	41.09%	1.34%	0.00%	1.37%	2.76%	0.51%	n/a	1.42%	0.04%
Camper 4 - Child	2.77%	52.10%	0.01%	0.00%	0.19%	39.06%	1.27%	0.00%	1.31%	2.62%	0.39%	n/a	0.24%	0.04%
Camper 4 - Adult	3.99%	49.35%	0.02%	0.00%	0.20%	40.50%	1.32%	0.00%	1.35%	2.72%	0.27%	0.05%	0.18%	0.05%
Camper 5 - Toddler	4.03%	62.28%	0.01%	0.00%	0.26%	27.55%	0.90%	0.00%	0.79%	3.57%	0.13%	n/a	0.47%	0.01%
Camper 5 - Child	3.50%	65.67%	0.01%	0.00%	0.24%	25.52%	0.83%	0.00%	0.73%	3.30%	0.10%	n/a	0.08%	0.01%
Camper 5 - Adult	5.07%	62.72%	0.01%	0.00%	0.26%	26.68%	0.87%	0.00%	0.77%	3.45%	0.07%	0.03%	0.06%	0.02%

Copper	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.50%	24.33%	0.03%	0.03%	0.05%	63.61%	10.10%	0.04%	0.05%	0.04%	0.40%	n/a	0.76%	0.07%
Camper 1 - Child	0.45%	26.99%	0.02%	0.03%	0.05%	61.98%	9.84%	0.03%	0.05%	0.04%	0.31%	n/a	0.13%	0.07%
Camper 1 - Adult	0.64%	25.16%	0.03%	0.03%	0.05%	63.24%	10.04%	0.04%	0.05%	0.04%	0.22%	0.28%	0.10%	0.08%
Camper 3 - Toddler	0.50%	24.46%	0.02%	0.02%	0.05%	63.94%	10.15%	0.04%	0.04%	0.04%	0.38%	n/a	0.35%	0.03%
Camper 3 - Child	0.45%	27.03%	0.02%	0.02%	0.05%	62.08%	9.86%	0.03%	0.04%	0.04%	0.29%	n/a	0.06%	0.03%
Camper 3 - Adult	0.64%	25.20%	0.02%	0.02%	0.05%	63.34%	10.06%	0.04%	0.04%	0.04%	0.20%	0.28%	0.04%	0.04%
Camper 4 - Toddler	0.68%	33.40%	0.02%	0.03%	0.06%	55.31%	8.78%	0.03%	0.04%	0.05%	0.35%	n/a	1.14%	0.10%
Camper 4 - Child	0.62%	36.71%	0.02%	0.03%	0.05%	53.40%	8.48%	0.03%	0.04%	0.05%	0.27%	n/a	0.19%	0.10%
Camper 4 - Adult	0.88%	34.51%	0.02%	0.03%	0.06%	54.94%	8.73%	0.03%	0.04%	0.05%	0.19%	0.25%	0.15%	0.13%
Camper 5 - Toddler	0.30%	14.94%	0.02%	0.02%	0.04%	72.12%	11.45%	0.04%	0.04%	0.02%	0.42%	n/a	0.52%	0.05%
Camper 5 - Child	0.28%	16.75%	0.02%	0.02%	0.04%	71.03%	11.28%	0.04%	0.04%	0.02%	0.33%	n/a	0.09%	0.05%
Camper 5 - Adult	0.39%	15.48%	0.02%	0.02%	0.04%	71.85%	11.41%	0.04%	0.04%	0.02%	0.23%	0.32%	0.07%	0.06%

Lead	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	1.68%	8.20%	17.11%	19.57%	0.09%	3.11%	0.44%	0.00%	0.85%	0.02%	0.30%	n/a	48.38%	0.25%
Camper 1 - Child	2.57%	15.28%	28.01%	32.02%	0.15%	5.08%	0.72%	0.00%	1.40%	0.02%	0.39%	n/a	13.91%	0.44%
Camper 1 - Adult	3.69%	14.42%	28.94%	33.09%	0.16%	5.25%	0.74%	0.00%	1.45%	0.03%	0.28%	0.77%	10.64%	0.55%
Camper 3 - Toddler	6.44%	31.48%	7.95%	9.53%	0.35%	11.92%	1.69%	0.00%	0.39%	0.06%	0.39%	n/a	29.62%	0.15%
Camper 3 - Child	7.59%	45.10%	10.01%	12.00%	0.44%	15.01%	2.13%	0.01%	0.49%	0.07%	0.39%	n/a	6.55%	0.21%
Camper 3 - Adult	10.59%	41.43%	10.07%	12.06%	0.45%	15.09%	2.14%	0.01%	0.49%	0.07%	0.27%	2.21%	4.87%	0.25%
Camper 4 - Toddler	1.07%	5.22%	10.80%	12.35%	0.14%	1.96%	0.28%	0.00%	0.54%	0.01%	0.19%	n/a	67.08%	0.35%
Camper 4 - Child	2.21%	13.12%	23.83%	27.24%	0.32%	4.32%	0.61%	0.00%	1.19%	0.02%	0.33%	n/a	25.99%	0.81%
Camper 4 - Adult	3.27%	12.79%	25.44%	29.08%	0.34%	4.62%	0.65%	0.00%	1.27%	0.02%	0.24%	0.68%	20.54%	1.06%
Camper 5 - Toddler	8.38%	40.97%	4.85%	5.81%	0.41%	7.27%	1.03%	0.00%	0.24%	0.08%	0.24%	n/a	30.57%	0.16%
Camper 5 - Child	9.83%	58.37%	6.07%	7.27%	0.51%	9.10%	1.29%	0.00%	0.30%	0.09%	0.24%	n/a	6.72%	0.21%
Camper 5 - Adult	13.87%	54.24%	6.17%	7.40%	0.52%	9.25%	1.31%	0.00%	0.30%	0.10%	0.16%	1.36%	5.06%	0.26%

Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

TABLE 4.5-8 (Cont'd)
PERCENTAGE BREAKDOWN BY PATHWAY FOR
“REMEDIATION” SCENARIO – FUTURE 2

Manganese	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	2.44%	34.36%	0.06%	0.14%	0.14%	21.20%	5.86%	0.26%	0.18%	0.02%	22.27%	n/a	12.04%	1.04%
Camper 1 - Child	2.53%	43.34%	0.07%	0.16%	0.15%	23.49%	6.50%	0.29%	0.20%	0.02%	19.69%	n/a	2.34%	1.22%
Camper 1 - Adult	2.39%	27.00%	0.05%	0.11%	0.11%	16.02%	4.43%	0.20%	0.13%	0.01%	9.11%	38.25%	1.18%	1.01%
Camper 3 - Toddler	2.33%	32.82%	0.15%	0.19%	0.13%	20.25%	5.60%	0.25%	0.61%	0.02%	7.47%	n/a	27.79%	2.39%
Camper 3 - Child	2.72%	46.62%	0.18%	0.23%	0.17%	25.28%	6.99%	0.31%	0.77%	0.02%	7.44%	n/a	6.09%	3.18%
Camper 3 - Adult	2.45%	27.64%	0.12%	0.15%	0.11%	16.40%	4.54%	0.20%	0.50%	0.01%	3.28%	39.16%	2.93%	2.51%
Camper 4 - Toddler	4.08%	57.51%	0.04%	0.09%	0.38%	13.67%	3.78%	0.17%	0.11%	0.03%	14.36%	n/a	5.33%	0.46%
Camper 4 - Child	3.81%	65.19%	0.04%	0.09%	0.37%	13.61%	3.76%	0.17%	0.11%	0.03%	11.40%	n/a	0.93%	0.49%
Camper 4 - Adult	4.24%	47.82%	0.03%	0.07%	0.30%	10.93%	3.02%	0.13%	0.09%	0.02%	6.22%	26.09%	0.55%	0.47%
Camper 5 - Toddler	3.08%	43.39%	0.12%	0.15%	0.11%	16.18%	4.47%	0.20%	0.49%	0.02%	5.97%	n/a	23.78%	2.05%
Camper 5 - Child	3.39%	58.02%	0.14%	0.18%	0.13%	19.00%	5.26%	0.23%	0.58%	0.02%	5.59%	n/a	4.91%	2.56%
Camper 5 - Adult	3.38%	38.09%	0.10%	0.13%	0.09%	13.66%	3.78%	0.17%	0.41%	0.02%	2.73%	32.61%	2.61%	2.24%

Nickel	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	7.56%	26.10%	0.39%	0.33%	0.49%	28.25%	4.49%	0.69%	9.12%	0.63%	7.64%	n/a	10.99%	3.32%
Camper 1 - Child	7.64%	32.04%	0.42%	0.36%	0.53%	30.46%	4.84%	0.75%	9.83%	0.68%	6.57%	n/a	2.08%	3.80%
Camper 1 - Adult	10.38%	28.66%	0.41%	0.35%	0.52%	29.83%	4.74%	0.73%	9.63%	0.66%	4.37%	3.70%	1.51%	4.52%
Camper 3 - Toddler	6.89%	23.78%	0.40%	0.47%	0.45%	25.74%	4.09%	0.63%	8.48%	0.57%	8.40%	n/a	15.43%	4.65%
Camper 3 - Child	7.28%	30.51%	0.45%	0.53%	0.50%	29.01%	4.61%	0.71%	9.56%	0.65%	7.55%	n/a	3.06%	5.58%
Camper 3 - Adult	9.92%	27.40%	0.45%	0.52%	0.49%	28.51%	4.53%	0.70%	9.39%	0.63%	5.04%	3.53%	2.22%	6.66%
Camper 4 - Toddler	14.33%	49.46%	0.20%	0.17%	0.36%	14.48%	2.30%	0.36%	4.67%	1.19%	3.91%	n/a	6.59%	1.99%
Camper 4 - Child	13.45%	56.39%	0.20%	0.17%	0.36%	14.50%	2.30%	0.36%	4.68%	1.19%	3.13%	n/a	1.16%	2.12%
Camper 4 - Adult	18.42%	50.86%	0.20%	0.17%	0.36%	14.31%	2.27%	0.35%	4.62%	1.18%	2.10%	1.77%	0.85%	2.54%
Camper 5 - Toddler	17.61%	60.76%	0.11%	0.12%	0.31%	6.76%	1.07%	0.17%	2.23%	1.46%	2.21%	n/a	5.52%	1.67%
Camper 5 - Child	16.11%	67.55%	0.10%	0.12%	0.31%	6.60%	1.05%	0.16%	2.18%	1.43%	1.72%	n/a	0.95%	1.73%
Camper 5 - Adult	22.17%	61.22%	0.10%	0.12%	0.30%	6.55%	1.04%	0.16%	2.16%	1.42%	1.16%	0.81%	0.70%	2.08%

Silver	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.01%	0.13%	0.00%	0.00%	0.00%	96.22%	3.25%	0.00%	0.06%	0.00%	0.04%	n/a	0.24%	0.05%
Camper 1 - Child	0.00%	0.15%	0.00%	0.00%	0.00%	96.39%	3.25%	0.00%	0.06%	0.00%	0.03%	n/a	0.04%	0.05%
Camper 1 - Adult	0.01%	0.14%	0.00%	0.00%	0.00%	96.41%	3.26%	0.00%	0.06%	0.00%	0.02%	0.01%	0.03%	0.07%
Camper 3 - Toddler	0.01%	0.13%	0.00%	0.00%	0.00%	96.25%	3.25%	0.00%	0.05%	0.00%	0.02%	n/a	0.24%	0.05%
Camper 3 - Child	0.00%	0.15%	0.00%	0.00%	0.00%	96.42%	3.26%	0.00%	0.05%	0.00%	0.01%	n/a	0.04%	0.05%
Camper 3 - Adult	0.01%	0.14%	0.00%	0.00%	0.00%	96.43%	3.26%	0.00%	0.05%	0.00%	0.01%	0.01%	0.03%	0.07%
Camper 4 - Toddler	0.18%	4.50%	0.00%	0.00%	0.00%	91.46%	3.09%	0.00%	0.06%	0.02%	0.04%	n/a	0.53%	0.11%
Camper 4 - Child	0.17%	5.11%	0.00%	0.00%	0.00%	91.30%	3.08%	0.00%	0.06%	0.02%	0.03%	n/a	0.09%	0.12%
Camper 4 - Adult	0.24%	4.69%	0.00%	0.00%	0.00%	91.65%	3.09%	0.00%	0.06%	0.02%	0.02%	0.01%	0.07%	0.15%
Camper 5 - Toddler	0.59%	14.65%	0.00%	0.00%	0.01%	81.62%	2.76%	0.00%	0.04%	0.07%	0.01%	n/a	0.20%	0.04%
Camper 5 - Child	0.54%	16.38%	0.00%	0.00%	0.01%	80.15%	2.71%	0.00%	0.04%	0.07%	0.01%	n/a	0.03%	0.05%
Camper 5 - Adult	0.76%	15.15%	0.00%	0.00%	0.01%	81.13%	2.74%	0.00%	0.04%	0.07%	0.01%	0.01%	0.03%	0.06%

Thallium	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	n/a	n/a	0.43%	1.63%	0.11%	86.98%	6.91%	1.01%	2.39%	n/a	0.54%	n/a	n/a	n/a
Camper 1 - Child	n/a	n/a	0.43%	1.63%	0.11%	87.08%	6.92%	1.01%	2.39%	n/a	0.43%	n/a	n/a	n/a
Camper 1 - Adult	n/a	n/a	0.40%	1.50%	0.10%	80.11%	6.36%	0.93%	2.20%	n/a	0.27%	8.12%	n/a	n/a
Camper 3 - Toddler	n/a	n/a	0.11%	0.17%	0.11%	88.19%	7.01%	1.02%	2.38%	n/a	1.00%	n/a	n/a	n/a
Camper 3 - Child	n/a	n/a	0.11%	0.17%	0.11%	88.37%	7.02%	1.02%	2.39%	n/a	0.80%	n/a	n/a	n/a
Camper 3 - Adult	n/a	n/a	0.10%	0.16%	0.10%	81.29%	6.46%	0.94%	2.20%	n/a	0.50%	8.24%	n/a	n/a
Camper 4 - Toddler	n/a	n/a	0.43%	1.63%	0.09%	87.00%	6.91%	1.01%	2.39%	n/a	0.54%	n/a	n/a	n/a
Camper 4 - Child	n/a	n/a	0.43%	1.63%	0.09%	87.10%	6.92%	1.01%	2.39%	n/a	0.43%	n/a	n/a	n/a
Camper 4 - Adult	n/a	n/a	0.40%	1.50%	0.08%	80.13%	6.37%	0.93%	2.20%	n/a	0.27%	8.13%	n/a	n/a
Camper 5 - Toddler	n/a	n/a	0.11%	0.17%	0.11%	88.19%	7.01%	1.02%	2.38%	n/a	1.00%	n/a	n/a	n/a
Camper 5 - Child	n/a	n/a	0.11%	0.17%	0.11%	88.37%	7.02%	1.02%	2.39%	n/a	0.80%	n/a	n/a	n/a
Camper 5 - Adult	n/a	n/a	0.10%	0.16%	0.10%	81.29%	6.46%	0.94%	2.20%	n/a	0.50%	8.24%	n/a	n/a

TABLE 4.5-8 (Cont'd)
PERCENTAGE BREAKDOWN BY PATHWAY FOR
“REMEDICATION” SCENARIO – FUTURE 2

Tin	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	n/a	n/a	0.69%	0.63%	0.58%	26.48%	8.41%	3.11%	15.59%	n/a	25.63%	n/a	17.39%	1.50%
Camper 1 - Child	n/a	n/a	0.85%	0.78%	0.71%	32.86%	10.44%	3.86%	19.34%	n/a	25.38%	n/a	3.79%	1.98%
Camper 1 - Adult	n/a	n/a	0.89%	0.82%	0.75%	34.59%	10.99%	4.06%	20.36%	n/a	18.14%	3.90%	2.95%	2.53%
Camper 3 - Toddler	n/a	n/a	1.58%	1.15%	0.56%	25.90%	8.23%	3.04%	34.07%	n/a	1.47%	n/a	22.10%	1.90%
Camper 3 - Child	n/a	n/a	1.94%	1.41%	0.69%	31.73%	10.08%	3.72%	41.75%	n/a	1.44%	n/a	4.76%	2.48%
Camper 3 - Adult	n/a	n/a	1.89%	1.37%	0.67%	30.98%	9.85%	3.64%	40.77%	n/a	0.96%	3.49%	3.44%	2.94%
Camper 4 - Toddler	n/a	n/a	0.70%	0.65%	1.38%	27.23%	8.65%	3.20%	16.03%	n/a	26.36%	n/a	14.55%	1.25%
Camper 4 - Child	n/a	n/a	0.85%	0.78%	1.67%	32.90%	10.46%	3.86%	19.37%	n/a	25.41%	n/a	3.09%	1.61%
Camper 4 - Adult	n/a	n/a	0.90%	0.82%	1.76%	34.60%	11.00%	4.06%	20.37%	n/a	18.14%	3.90%	2.40%	2.06%
Camper 5 - Toddler	n/a	n/a	1.39%	1.01%	0.50%	22.85%	7.26%	2.68%	30.07%	n/a	1.30%	n/a	30.32%	2.61%
Camper 5 - Child	n/a	n/a	1.86%	1.35%	0.66%	30.51%	9.69%	3.58%	40.14%	n/a	1.39%	n/a	7.11%	3.71%
Camper 5 - Adult	n/a	n/a	1.83%	1.33%	0.65%	29.93%	9.51%	3.51%	39.38%	n/a	0.92%	3.37%	5.16%	4.42%

Zinc	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.02%	1.67%	0.27%	0.17%	0.19%	87.34%	6.51%	2.58%	0.96%	0.05%	0.03%	n/a	0.21%	0.004%
Camper 1 - Child	0.02%	1.90%	0.27%	0.17%	0.19%	87.30%	6.50%	2.58%	0.96%	0.05%	0.02%	n/a	0.04%	0.004%
Camper 1 - Adult	0.03%	1.74%	0.27%	0.17%	0.19%	87.41%	6.51%	2.59%	0.96%	0.05%	0.01%	0.04%	0.03%	0.005%
Camper 3 - Toddler	0.02%	1.68%	0.15%	0.40%	0.19%	87.97%	6.55%	2.60%	0.26%	0.05%	0.03%	n/a	0.10%	0.002%
Camper 3 - Child	0.02%	1.91%	0.15%	0.40%	0.19%	87.84%	6.54%	2.60%	0.26%	0.05%	0.02%	n/a	0.02%	0.002%
Camper 3 - Adult	0.03%	1.75%	0.15%	0.40%	0.19%	87.95%	6.55%	2.60%	0.26%	0.05%	0.01%	0.04%	0.01%	0.002%
Camper 4 - Toddler	0.24%	18.20%	0.22%	0.14%	0.39%	71.69%	5.34%	2.12%	0.79%	0.56%	0.02%	n/a	0.29%	0.005%
Camper 4 - Child	0.22%	20.26%	0.22%	0.13%	0.38%	70.11%	5.22%	2.07%	0.77%	0.55%	0.02%	n/a	0.05%	0.005%
Camper 4 - Adult	0.30%	18.82%	0.22%	0.14%	0.39%	71.29%	5.31%	2.11%	0.78%	0.55%	0.01%	0.03%	0.04%	0.006%
Camper 5 - Toddler	0.08%	5.88%	0.14%	0.38%	0.23%	83.97%	6.26%	2.48%	0.25%	0.18%	0.02%	n/a	0.12%	0.002%
Camper 5 - Child	0.07%	6.65%	0.14%	0.38%	0.23%	83.39%	6.21%	2.47%	0.25%	0.18%	0.02%	n/a	0.02%	0.002%
Camper 5 - Adult	0.10%	6.11%	0.14%	0.38%	0.23%	83.82%	6.24%	2.48%	0.25%	0.18%	0.01%	0.04%	0.02%	0.003%

Intakes are presented in Table 4.5-9 for the “Remediation” Future 3 scenario, when the maximum acid generating potential of the rock is realized. Not surprisingly, these intakes are higher than those predicted in the “Remediation” Future 2 scenario. As described above, thallium and tin intakes have not changed, as there were no measured water concentrations available to predict into the future. In the Future 3 scenario, Camper 4 generally represents the most exposed individuals.

Table 4.5-10 provides the percentage breakdown by pathway. Consumption of fish caught on site and moose hunted on site are still the greatest exposure pathways in this scenario. Soil ingestion for a Camper 1 toddler is still the dominant pathway of exposure to lead.

TABLE 4.5-9
HUMAN INTAKES OF COPC FOR “REMEDIATION” SCENARIO – FUTURE 3

Intake by Pathway															
Arsenic mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	2.87x10 ⁻⁶	1.28x10 ⁻⁵	5.65x10 ⁻⁸	5.27x10 ⁻⁸	1.63x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.65x10 ⁻⁸	1.22x10 ⁻⁶	5.43x10 ⁻⁷	3.46x10 ⁻⁷	0.00	1.23x10 ⁻⁵	3.58x10 ⁻⁵	3.39x10 ⁻⁷
Camper 1 - Child	1.92x10 ⁻⁶	1.04x10 ⁻⁵	4.03x10 ⁻⁸	3.76x10 ⁻⁸	1.16x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.18x10 ⁻⁸	8.73x10 ⁻⁷	3.87x10 ⁻⁷	1.97x10 ⁻⁷	0.00	1.54x10 ⁻⁶	1.94x10 ⁻⁵	2.58x10 ⁻⁷
Camper 1 - Adult	1.68x10 ⁻⁶	5.98x10 ⁻⁶	2.53x10 ⁻⁸	2.36x10 ⁻⁸	7.32x10 ⁻⁹	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.43x10 ⁻⁹	5.49x10 ⁻⁷	2.44x10 ⁻⁷	8.41x10 ⁻⁸	4.51x10 ⁻⁸	7.18x10 ⁻⁷	1.19x10 ⁻⁵	1.97x10 ⁻⁷
Camper 3 - Toddler	2.87x10 ⁻⁶	1.28x10 ⁻⁵	2.65x10 ⁻⁸	3.48x10 ⁻⁸	1.63x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.65x10 ⁻⁸	4.97x10 ⁻⁷	5.43x10 ⁻⁷	6.84x10 ⁻⁷	0.00	5.33x10 ⁻⁶	2.84x10 ⁻⁵	1.47x10 ⁻⁷
Camper 3 - Child	1.92x10 ⁻⁶	1.04x10 ⁻⁵	1.89x10 ⁻⁸	2.48x10 ⁻⁸	1.16x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.18x10 ⁻⁸	3.55x10 ⁻⁷	3.87x10 ⁻⁷	3.89x10 ⁻⁷	0.00	6.68x10 ⁻⁷	1.82x10 ⁻⁵	1.12x10 ⁻⁷
Camper 3 - Adult	1.68x10 ⁻⁶	5.98x10 ⁻⁶	1.19x10 ⁻⁸	1.56x10 ⁻⁸	7.32x10 ⁻⁹	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.43x10 ⁻⁹	2.23x10 ⁻⁷	2.44x10 ⁻⁷	1.66x10 ⁻⁷	4.51x10 ⁻⁸	3.11x10 ⁻⁷	1.12x10 ⁻⁵	8.52x10 ⁻⁸
Camper 4 - Toddler	3.56x10 ⁻⁵	1.59x10 ⁻⁴	5.65x10 ⁻⁸	5.27x10 ⁻⁸	1.08x10 ⁻⁷	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.65x10 ⁻⁸	1.22x10 ⁻⁶	6.73x10 ⁻⁶	3.46x10 ⁻⁷	0.00	1.22x10 ⁻⁵	2.21x10 ⁻⁴	3.37x10 ⁻⁷
Camper 4 - Child	2.38x10 ⁻⁵	1.29x10 ⁻⁴	4.03x10 ⁻⁸	3.76x10 ⁻⁸	7.68x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.18x10 ⁻⁸	8.73x10 ⁻⁷	4.80x10 ⁻⁶	1.97x10 ⁻⁷	0.00	1.53x10 ⁻⁶	1.64x10 ⁻⁴	2.56x10 ⁻⁷
Camper 4 - Adult	2.08x10 ⁻⁵	7.41x10 ⁻⁵	2.53x10 ⁻⁸	2.36x10 ⁻⁸	4.83x10 ⁻⁸	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.43x10 ⁻⁹	5.49x10 ⁻⁷	3.02x10 ⁻⁶	8.41x10 ⁻⁸	4.51x10 ⁻⁸	7.14x10 ⁻⁷	1.02x10 ⁻⁴	1.96x10 ⁻⁷
Camper 5 - Toddler	1.82x10 ⁻⁵	8.10x10 ⁻⁵	2.65x10 ⁻⁸	3.48x10 ⁻⁸	5.00x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.65x10 ⁻⁸	4.97x10 ⁻⁷	3.44x10 ⁻⁶	6.84x10 ⁻⁷	0.00	8.47x10 ⁻⁶	1.18x10 ⁻⁴	2.33x10 ⁻⁷
Camper 5 - Child	1.22x10 ⁻⁵	6.58x10 ⁻⁵	1.89x10 ⁻⁸	2.48x10 ⁻⁸	3.57x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.18x10 ⁻⁸	3.55x10 ⁻⁷	2.45x10 ⁻⁶	3.89x10 ⁻⁷	0.00	1.06x10 ⁻⁶	8.63x10 ⁻⁵	1.77x10 ⁻⁷
Camper 5 - Adult	1.06x10 ⁻⁵	3.78x10 ⁻⁵	1.19x10 ⁻⁸	1.56x10 ⁻⁸	2.24x10 ⁻⁸	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.43x10 ⁻⁹	2.23x10 ⁻⁷	1.54x10 ⁻⁶	1.66x10 ⁻⁷	4.51x10 ⁻⁸	4.94x10 ⁻⁷	5.35x10 ⁻⁵	1.35x10 ⁻⁷

Cadmium mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	2.33x10 ⁻⁶	3.60x10 ⁻⁵	1.76x10 ⁻⁸	3.00x10 ⁻⁹	1.89x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.70x10 ⁻⁹	1.56x10 ⁻⁶	2.06x10 ⁻⁶	5.78x10 ⁻⁷	0.00	1.16x10 ⁻⁶	9.20x10 ⁻⁵	3.20x10 ⁻⁸
Camper 1 - Child	1.56x10 ⁻⁶	2.93x10 ⁻⁵	1.26x10 ⁻⁸	2.14x10 ⁻⁹	1.35x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.21x10 ⁻⁹	1.11x10 ⁻⁶	1.47x10 ⁻⁶	3.29x10 ⁻⁷	0.00	1.45x10 ⁻⁷	6.83x10 ⁻⁵	2.43x10 ⁻⁸
Camper 1 - Adult	1.36x10 ⁻⁶	1.68x10 ⁻⁵	7.91x10 ⁻⁹	1.35x10 ⁻⁹	8.50x10 ⁻⁸	2.09x10 ⁻⁵	6.81x10 ⁻⁷	7.62x10 ⁻¹⁰	6.99x10 ⁻⁷	9.25x10 ⁻⁷	1.40x10 ⁻⁷	2.71x10 ⁻⁸	6.76x10 ⁻⁸	4.17x10 ⁻⁵	1.85x10 ⁻⁸
Camper 3 - Toddler	2.33x10 ⁻⁶	3.60x10 ⁻⁵	1.50x10 ⁻⁸	2.32x10 ⁻⁹	1.89x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.70x10 ⁻⁹	1.34x10 ⁻⁶	2.06x10 ⁻⁶	2.25x10 ⁻⁷	0.00	1.08x10 ⁻⁶	9.13x10 ⁻⁵	2.98x10 ⁻⁸
Camper 3 - Child	1.56x10 ⁻⁶	2.93x10 ⁻⁵	1.07x10 ⁻⁸	1.66x10 ⁻⁹	1.35x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.21x10 ⁻⁹	9.55x10 ⁻⁷	1.47x10 ⁻⁶	1.28x10 ⁻⁷	0.00	1.36x10 ⁻⁷	6.80x10 ⁻⁵	2.26x10 ⁻⁸
Camper 3 - Adult	1.36x10 ⁻⁶	1.68x10 ⁻⁵	6.72x10 ⁻⁹	1.04x10 ⁻⁹	8.50x10 ⁻⁸	2.09x10 ⁻⁵	6.81x10 ⁻⁷	7.62x10 ⁻¹⁰	6.01x10 ⁻⁷	9.25x10 ⁻⁷	5.47x10 ⁻⁸	2.71x10 ⁻⁸	6.31x10 ⁻⁸	4.15x10 ⁻⁵	1.73x10 ⁻⁸
Camper 4 - Toddler	1.27x10 ⁻⁵	1.96x10 ⁻⁴	1.76x10 ⁻⁸	3.00x10 ⁻⁹	7.49x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.70x10 ⁻⁹	1.56x10 ⁻⁶	1.12x10 ⁻⁵	5.78x10 ⁻⁷	0.00	1.60x10 ⁻⁶	2.72x10 ⁻⁴	4.42x10 ⁻⁸
Camper 4 - Child	8.48x10 ⁻⁶	1.59x10 ⁻⁴	1.26x10 ⁻⁸	2.14x10 ⁻⁹	5.35x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.21x10 ⁻⁹	1.11x10 ⁻⁶	8.01x10 ⁻⁶	3.29x10 ⁻⁷	0.00	2.01x10 ⁻⁷	2.12x10 ⁻⁴	3.36x10 ⁻⁸
Camper 4 - Adult	7.40x10 ⁻⁶	9.15x10 ⁻⁵	7.91x10 ⁻⁹	1.35x10 ⁻⁹	3.36x10 ⁻⁷	2.09x10 ⁻⁵	6.81x10 ⁻⁷	7.62x10 ⁻¹⁰	6.99x10 ⁻⁷	5.04x10 ⁻⁶	1.40x10 ⁻⁷	2.71x10 ⁻⁸	9.36x10 ⁻⁸	1.27x10 ⁻⁴	2.56x10 ⁻⁸
Camper 5 - Toddler	8.53x10 ⁻⁶	1.32x10 ⁻⁴	1.50x10 ⁻⁸	2.32x10 ⁻⁹	5.44x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.70x10 ⁻⁹	1.34x10 ⁻⁶	7.55x10 ⁻⁶	2.25x10 ⁻⁷	0.00	7.89x10 ⁻⁷	1.99x10 ⁻⁴	2.18x10 ⁻⁸
Camper 5 - Child	5.70x10 ⁻⁶	1.07x10 ⁻⁴	1.07x10 ⁻⁸	1.66x10 ⁻⁹	3.89x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.21x10 ⁻⁹	9.55x10 ⁻⁷	5.39x10 ⁻⁶	1.28x10 ⁻⁷	0.00	9.89x10 ⁻⁸	1.54x10 ⁻⁴	1.65x10 ⁻⁸
Camper 5 - Adult	4.98x10 ⁻⁶	6.16x10 ⁻⁵	6.72x10 ⁻⁹	1.04x10 ⁻⁹	2.44x10 ⁻⁷	2.09x10 ⁻⁵	6.81x10 ⁻⁷	7.62x10 ⁻¹⁰	6.01x10 ⁻⁷	3.39x10 ⁻⁶	5.47x10 ⁻⁸	2.71x10 ⁻⁸	4.60x10 ⁻⁸	9.25x10 ⁻⁵	1.26x10 ⁻⁸

TABLE 4.5-9 (Cont'd)
HUMAN INTAKES OF COPC FOR “REMEDIATION” SCENARIO – FUTURE 3

Copper mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	2.40x10 ⁻⁵	1.18x10 ⁻³	1.17x10 ⁻⁶	1.42x10 ⁻⁶	2.33x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.64x10 ⁻⁶	2.35x10 ⁻⁶	1.92x10 ⁻⁶	1.85x10 ⁻⁵	0.00	3.49x10 ⁻⁵	4.65x10 ⁻³	3.00x10 ⁻⁶
Camper 1 - Child	1.61x10 ⁻⁵	9.57x10 ⁻⁴	8.38x10 ⁻⁷	1.01x10 ⁻⁶	1.67x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.17x10 ⁻⁶	1.68x10 ⁻⁶	1.37x10 ⁻⁶	1.05x10 ⁻⁵	0.00	4.37x10 ⁻⁶	3.41x10 ⁻³	2.28x10 ⁻⁶
Camper 1 - Adult	1.40x10 ⁻⁵	5.50x10 ⁻⁴	5.27x10 ⁻⁷	6.35x10 ⁻⁷	1.05x10 ⁻⁶	1.31x10 ⁻³	2.08x10 ⁻⁴	7.34x10 ⁻⁷	1.05x10 ⁻⁶	8.61x10 ⁻⁷	4.50x10 ⁻⁶	5.86x10 ⁻⁶	2.03x10 ⁻⁶	2.10x10 ⁻³	1.74x10 ⁻⁶
Camper 3 - Toddler	2.40x10 ⁻⁵	1.18x10 ⁻³	7.60x10 ⁻⁷	9.35x10 ⁻⁷	2.33x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.64x10 ⁻⁶	1.69x10 ⁻⁶	1.92x10 ⁻⁶	1.72x10 ⁻⁵	0.00	1.58x10 ⁻⁵	4.63x10 ⁻³	1.36x10 ⁻⁶
Camper 3 - Child	1.61x10 ⁻⁵	9.57x10 ⁻⁴	5.43x10 ⁻⁷	6.67x10 ⁻⁷	1.67x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.17x10 ⁻⁶	1.21x10 ⁻⁶	1.37x10 ⁻⁶	9.78x10 ⁻⁶	0.00	1.98x10 ⁻⁶	3.41x10 ⁻³	1.03x10 ⁻⁶
Camper 3 - Adult	1.40x10 ⁻⁵	5.50x10 ⁻⁴	3.41x10 ⁻⁷	4.20x10 ⁻⁷	1.05x10 ⁻⁶	1.31x10 ⁻³	2.08x10 ⁻⁴	7.34x10 ⁻⁷	7.61x10 ⁻⁷	8.61x10 ⁻⁷	4.17x10 ⁻⁶	5.86x10 ⁻⁶	9.23x10 ⁻⁷	2.10x10 ⁻³	7.90x10 ⁻⁷
Camper 4 - Toddler	2.28x10 ⁻⁴	1.12x10 ⁻²	1.17x10 ⁻⁶	1.42x10 ⁻⁶	1.57x10 ⁻⁵	2.92x10 ⁻³	4.64x10 ⁻⁴	1.64x10 ⁻⁶	2.35x10 ⁻⁶	1.82x10 ⁻⁵	1.85x10 ⁻⁵	0.00	6.05x10 ⁻⁵	1.49x10 ⁻²	5.21x10 ⁻⁶
Camper 4 - Child	1.52x10 ⁻⁴	9.08x10 ⁻³	8.38x10 ⁻⁷	1.01x10 ⁻⁶	1.12x10 ⁻⁵	2.09x10 ⁻³	3.31x10 ⁻⁴	1.17x10 ⁻⁶	1.68x10 ⁻⁶	1.30x10 ⁻⁵	1.05x10 ⁻⁵	0.00	7.58x10 ⁻⁶	1.17x10 ⁻²	3.95x10 ⁻⁶
Camper 4 - Adult	1.33x10 ⁻⁴	5.22x10 ⁻³	5.27x10 ⁻⁷	6.35x10 ⁻⁷	7.04x10 ⁻⁶	1.31x10 ⁻³	2.08x10 ⁻⁴	7.34x10 ⁻⁷	1.05x10 ⁻⁶	8.17x10 ⁻⁶	4.50x10 ⁻⁶	5.86x10 ⁻⁶	3.53x10 ⁻⁶	6.90x10 ⁻³	3.02x10 ⁻⁶
Camper 5 - Toddler	4.63x10 ⁻⁵	2.27x10 ⁻³	7.60x10 ⁻⁷	9.35x10 ⁻⁷	3.81x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.64x10 ⁻⁶	1.69x10 ⁻⁶	3.70x10 ⁻⁶	1.72x10 ⁻⁵	0.00	2.12x10 ⁻⁵	5.75x10 ⁻³	1.83x10 ⁻⁶
Camper 5 - Child	3.10x10 ⁻⁵	1.85x10 ⁻³	5.43x10 ⁻⁷	6.67x10 ⁻⁷	2.72x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.17x10 ⁻⁶	1.21x10 ⁻⁶	2.64x10 ⁻⁶	9.78x10 ⁻⁶	0.00	2.66x10 ⁻⁶	4.31x10 ⁻³	1.39x10 ⁻⁶
Camper 5 - Adult	2.70x10 ⁻⁵	1.06x10 ⁻³	3.41x10 ⁻⁷	4.20x10 ⁻⁷	1.71x10 ⁻⁶	1.31x10 ⁻³	2.08x10 ⁻⁴	7.34x10 ⁻⁷	7.61x10 ⁻⁷	1.66x10 ⁻⁶	4.17x10 ⁻⁶	5.86x10 ⁻⁶	1.24x10 ⁻⁶	2.62x10 ⁻³	1.06x10 ⁻⁶

Lead mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	1.93x10 ⁻⁵	9.42x10 ⁻⁵	1.96x10 ⁻⁴	2.25x10 ⁻⁴	1.06x10 ⁻⁶	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.24x10 ⁻⁸	9.81x10 ⁻⁶	1.74x10 ⁻⁷	3.45x10 ⁻⁶	0.00	5.55x10 ⁻⁴	1.15x10 ⁻³	2.87x10 ⁻⁶
Camper 1 - Child	1.29x10 ⁻⁵	7.65x10 ⁻⁵	1.40x10 ⁻⁴	1.60x10 ⁻⁴	7.54x10 ⁻⁷	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.88x10 ⁻⁹	7.00x10 ⁻⁶	1.24x10 ⁻⁷	1.96x10 ⁻⁶	0.00	6.96x10 ⁻⁵	4.99x10 ⁻⁴	2.18x10 ⁻⁶
Camper 1 - Adult	1.12x10 ⁻⁵	4.40x10 ⁻⁵	8.82x10 ⁻⁵	1.01x10 ⁻⁴	4.74x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.58x10 ⁻⁹	4.40x10 ⁻⁶	7.81x10 ⁻⁸	8.39x10 ⁻⁷	2.34x10 ⁻⁶	3.24x10 ⁻⁵	3.03x10 ⁻⁴	1.66x10 ⁻⁶
Camper 3 - Toddler	1.93x10 ⁻⁵	9.42x10 ⁻⁵	2.38x10 ⁻⁵	2.85x10 ⁻⁵	1.06x10 ⁻⁶	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.24x10 ⁻⁸	1.17x10 ⁻⁶	1.74x10 ⁻⁷	1.16x10 ⁻⁶	0.00	8.86x10 ⁻⁵	2.99x10 ⁻⁴	4.58x10 ⁻⁷
Camper 3 - Child	1.29x10 ⁻⁵	7.65x10 ⁻⁵	1.70x10 ⁻⁵	2.03x10 ⁻⁵	7.54x10 ⁻⁷	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.88x10 ⁻⁹	8.31x10 ⁻⁷	1.24x10 ⁻⁷	6.63x10 ⁻⁷	0.00	1.11x10 ⁻⁵	1.69x10 ⁻⁴	3.48x10 ⁻⁷
Camper 3 - Adult	1.12x10 ⁻⁵	4.40x10 ⁻⁵	1.07x10 ⁻⁵	1.28x10 ⁻⁵	4.74x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.58x10 ⁻⁹	5.23x10 ⁻⁷	7.81x10 ⁻⁸	2.83x10 ⁻⁷	2.34x10 ⁻⁶	5.17x10 ⁻⁶	1.06x10 ⁻⁴	2.66x10 ⁻⁷
Camper 4 - Toddler	2.17x10 ⁻⁵	1.06x10 ⁻⁴	1.96x10 ⁻⁴	2.25x10 ⁻⁴	2.73x10 ⁻⁶	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.24x10 ⁻⁸	9.81x10 ⁻⁶	1.96x10 ⁻⁷	3.45x10 ⁻⁶	0.00	1.22x10 ⁻³	1.83x10 ⁻³	6.31x10 ⁻⁶
Camper 4 - Child	1.45x10 ⁻⁵	8.61x10 ⁻⁵	1.40x10 ⁻⁴	1.60x10 ⁻⁴	1.95x10 ⁻⁶	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.88x10 ⁻⁹	7.00x10 ⁻⁶	1.40x10 ⁻⁷	1.96x10 ⁻⁶	0.00	1.53x10 ⁻⁴	5.94x10 ⁻⁴	4.79x10 ⁻⁶
Camper 4 - Adult	1.26x10 ⁻⁵	4.95x10 ⁻⁵	8.82x10 ⁻⁵	1.01x10 ⁻⁴	1.23x10 ⁻⁶	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.58x10 ⁻⁹	4.40x10 ⁻⁶	8.79x10 ⁻⁸	8.39x10 ⁻⁷	2.34x10 ⁻⁶	7.12x10 ⁻⁵	3.49x10 ⁻⁴	3.66x10 ⁻⁶
Camper 5 - Toddler	4.16x10 ⁻⁵	2.03x10 ⁻⁴	2.38x10 ⁻⁵	2.85x10 ⁻⁵	2.03x10 ⁻⁶	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.24x10 ⁻⁸	1.17x10 ⁻⁶	3.76x10 ⁻⁷	1.16x10 ⁻⁶	0.00	1.50x10 ⁻⁴	4.93x10 ⁻⁴	7.75x10 ⁻⁷
Camper 5 - Child	2.78x10 ⁻⁵	1.65x10 ⁻⁴	1.70x10 ⁻⁵	2.03x10 ⁻⁵	1.45x10 ⁻⁶	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.88x10 ⁻⁹	8.31x10 ⁻⁷	2.68x10 ⁻⁷	6.63x10 ⁻⁷	0.00	1.88x10 ⁻⁵	2.81x10 ⁻⁴	5.89x10 ⁻⁷
Camper 5 - Adult	2.43x10 ⁻⁵	9.49x10 ⁻⁵	1.07x10 ⁻⁵	1.28x10 ⁻⁵	9.10x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.58x10 ⁻⁹	5.23x10 ⁻⁷	1.69x10 ⁻⁷	2.83x10 ⁻⁷	2.34x10 ⁻⁶	8.75x10 ⁻⁶	1.74x10 ⁻⁴	4.50x10 ⁻⁷

TABLE 4.5-9 (Cont'd)
HUMAN INTAKES OF COPC FOR “REMEDIATION” SCENARIO – FUTURE 3

Manganese mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	7.12x10 ⁻⁵	1.00x10 ⁻³	1.62x10 ⁻⁶	3.83x10 ⁻⁶	3.76x10 ⁻⁶	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.04x10 ⁻⁶	4.78x10 ⁻⁶	4.61x10 ⁻⁷	5.99x10 ⁻⁴	0.00	3.24x10 ⁻⁴	2.75x10 ⁻³	2.79x10 ⁻⁵
Camper 1 - Child	4.76x10 ⁻⁵	8.15x10 ⁻⁴	1.15x10 ⁻⁶	2.73x10 ⁻⁶	2.69x10 ⁻⁶	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.03x10 ⁻⁶	3.41x10 ⁻⁶	3.29x10 ⁻⁷	3.41x10 ⁻⁴	0.00	4.06x10 ⁻⁵	1.78x10 ⁻³	2.12x10 ⁻⁵
Camper 1 - Adult	4.15x10 ⁻⁵	4.68x10 ⁻⁴	7.26x10 ⁻⁷	1.72x10 ⁻⁶	1.69x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.16x10 ⁻⁶	2.14x10 ⁻⁶	2.07x10 ⁻⁷	1.46x10 ⁻⁴	6.11x10 ⁻⁴	1.89x10 ⁻⁵	1.62x10 ⁻³	1.62x10 ⁻⁵
Camper 3 - Toddler	7.12x10 ⁻⁵	1.00x10 ⁻³	4.09x10 ⁻⁶	5.26x10 ⁻⁶	3.76x10 ⁻⁶	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.04x10 ⁻⁶	1.73x10 ⁻⁵	4.61x10 ⁻⁷	2.10x10 ⁻⁴	0.00	7.83x10 ⁻⁴	2.83x10 ⁻³	6.75x10 ⁻⁵
Camper 3 - Child	4.76x10 ⁻⁵	8.15x10 ⁻⁴	2.92x10 ⁻⁶	3.75x10 ⁻⁶	2.69x10 ⁻⁶	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.03x10 ⁻⁶	1.23x10 ⁻⁵	3.29x10 ⁻⁷	1.20x10 ⁻⁴	0.00	9.82x10 ⁻⁵	1.63x10 ⁻³	5.12x10 ⁻⁵
Camper 3 - Adult	4.15x10 ⁻⁵	4.68x10 ⁻⁴	1.84x10 ⁻⁶	2.36x10 ⁻⁶	1.69x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.16x10 ⁻⁶	7.75x10 ⁻⁶	2.07x10 ⁻⁷	5.12x10 ⁻⁵	6.11x10 ⁻⁴	4.57x10 ⁻⁵	1.56x10 ⁻³	3.91x10 ⁻⁵
Camper 4 - Toddler	1.06x10 ⁻³	1.49x10 ⁻²	1.62x10 ⁻⁶	3.83x10 ⁻⁶	1.71x10 ⁻⁵	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.04x10 ⁻⁶	4.78x10 ⁻⁶	6.85x10 ⁻⁶	5.99x10 ⁻⁴	0.00	2.22x10 ⁻⁴	1.76x10 ⁻²	1.92x10 ⁻⁵
Camper 4 - Child	7.08x10 ⁻⁴	1.21x10 ⁻²	1.15x10 ⁻⁶	2.73x10 ⁻⁶	1.22x10 ⁻⁵	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.03x10 ⁻⁶	3.41x10 ⁻⁶	4.89x10 ⁻⁶	3.41x10 ⁻⁴	0.00	2.79x10 ⁻⁵	1.38x10 ⁻²	1.45x10 ⁻⁵
Camper 4 - Adult	6.18x10 ⁻⁴	6.97x10 ⁻³	7.26x10 ⁻⁷	1.72x10 ⁻⁶	7.67x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.16x10 ⁻⁶	2.14x10 ⁻⁶	3.08x10 ⁻⁶	1.46x10 ⁻⁴	6.11x10 ⁻⁴	1.30x10 ⁻⁵	8.70x10 ⁻³	1.11x10 ⁻⁵
Camper 5 - Toddler	6.60x10 ⁻⁴	9.30x10 ⁻³	4.09x10 ⁻⁶	5.26x10 ⁻⁶	4.67x10 ⁻⁶	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.04x10 ⁻⁶	1.73x10 ⁻⁵	4.27x10 ⁻⁶	2.10x10 ⁻⁴	0.00	8.39x10 ⁻⁴	1.18x10 ⁻²	7.23x10 ⁻⁵
Camper 5 - Child	4.41x10 ⁻⁴	7.55x10 ⁻³	2.92x10 ⁻⁶	3.75x10 ⁻⁶	3.33x10 ⁻⁶	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.03x10 ⁻⁶	1.23x10 ⁻⁵	3.05x10 ⁻⁶	1.20x10 ⁻⁴	0.00	1.05x10 ⁻⁴	8.77x10 ⁻³	5.49x10 ⁻⁵
Camper 5 - Adult	3.85x10 ⁻⁴	4.34x10 ⁻³	1.84x10 ⁻⁶	2.36x10 ⁻⁶	2.10x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.16x10 ⁻⁶	7.75x10 ⁻⁶	1.92x10 ⁻⁶	5.12x10 ⁻⁵	6.11x10 ⁻⁴	4.89x10 ⁻⁵	5.78x10 ⁻³	4.19x10 ⁻⁵

Nickel mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	4.83x10 ⁻⁶	1.67x10 ⁻⁵	2.44x10 ⁻⁷	2.08x10 ⁻⁷	3.09x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.38x10 ⁻⁷	5.76x10 ⁻⁶	4.01x10 ⁻⁷	4.82x10 ⁻⁶	0.00	6.94x10 ⁻⁶	6.13x10 ⁻⁵	2.09x10 ⁻⁶
Camper 1 - Child	3.23x10 ⁻⁶	1.35x10 ⁻⁵	1.74x10 ⁻⁷	1.49x10 ⁻⁷	2.21x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.12x10 ⁻⁷	4.11x10 ⁻⁶	2.86x10 ⁻⁷	2.74x10 ⁻⁶	0.00	8.70x10 ⁻⁷	4.04x10 ⁻⁵	1.59x10 ⁻⁶
Camper 1 - Adult	2.82x10 ⁻⁶	7.77x10 ⁻⁶	1.10x10 ⁻⁷	9.34x10 ⁻⁸	1.39x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	1.96x10 ⁻⁷	2.58x10 ⁻⁶	1.80x10 ⁻⁷	1.17x10 ⁻⁶	9.92x10 ⁻⁷	4.05x10 ⁻⁷	2.57x10 ⁻⁵	1.21x10 ⁻⁶
Camper 3 - Toddler	4.83x10 ⁻⁶	1.67x10 ⁻⁵	2.80x10 ⁻⁷	3.27x10 ⁻⁷	3.09x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.38x10 ⁻⁷	5.88x10 ⁻⁶	4.01x10 ⁻⁷	5.82x10 ⁻⁶	0.00	1.07x10 ⁻⁵	6.63x10 ⁻⁵	3.22x10 ⁻⁶
Camper 3 - Child	3.23x10 ⁻⁶	1.35x10 ⁻⁵	2.00x10 ⁻⁷	2.33x10 ⁻⁷	2.21x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.12x10 ⁻⁷	4.19x10 ⁻⁶	2.86x10 ⁻⁷	3.31x10 ⁻⁶	0.00	1.34x10 ⁻⁶	4.16x10 ⁻⁵	2.45x10 ⁻⁶
Camper 3 - Adult	2.82x10 ⁻⁶	7.77x10 ⁻⁶	1.26x10 ⁻⁷	1.47x10 ⁻⁷	1.39x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	1.96x10 ⁻⁷	2.64x10 ⁻⁶	1.80x10 ⁻⁷	1.41x10 ⁻⁶	9.92x10 ⁻⁷	6.24x10 ⁻⁷	2.63x10 ⁻⁵	1.87x10 ⁻⁶
Camper 4 - Toddler	2.56x10 ⁻⁵	8.85x10 ⁻⁵	2.44x10 ⁻⁷	2.08x10 ⁻⁷	5.44x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.38x10 ⁻⁷	5.76x10 ⁻⁶	2.13x10 ⁻⁶	4.82x10 ⁻⁶	0.00	8.11x10 ⁻⁶	1.57x10 ⁻⁴	2.45x10 ⁻⁶
Camper 4 - Child	1.71x10 ⁻⁵	7.19x10 ⁻⁵	1.74x10 ⁻⁷	1.49x10 ⁻⁷	3.88x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.12x10 ⁻⁷	4.11x10 ⁻⁶	1.52x10 ⁻⁶	2.74x10 ⁻⁶	0.00	1.02x10 ⁻⁶	1.14x10 ⁻⁴	1.86x10 ⁻⁶
Camper 4 - Adult	1.50x10 ⁻⁵	4.13x10 ⁻⁵	1.10x10 ⁻⁷	9.34x10 ⁻⁸	2.44x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	1.96x10 ⁻⁷	2.58x10 ⁻⁶	9.55x10 ⁻⁷	1.17x10 ⁻⁶	9.92x10 ⁻⁷	4.73x10 ⁻⁷	7.23x10 ⁻⁵	1.42x10 ⁻⁶
Camper 5 - Toddler	5.18x10 ⁻⁵	1.79x10 ⁻⁴	2.80x10 ⁻⁷	3.27x10 ⁻⁷	8.93x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.38x10 ⁻⁷	5.88x10 ⁻⁶	4.30x10 ⁻⁶	5.82x10 ⁻⁶	0.00	1.46x10 ⁻⁵	2.84x10 ⁻⁴	4.39x10 ⁻⁶
Camper 5 - Child	3.47x10 ⁻⁵	1.45x10 ⁻⁴	2.00x10 ⁻⁷	2.33x10 ⁻⁷	6.37x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.12x10 ⁻⁷	4.19x10 ⁻⁶	3.07x10 ⁻⁶	3.31x10 ⁻⁶	0.00	1.83x10 ⁻⁶	2.09x10 ⁻⁴	3.33x10 ⁻⁶
Camper 5 - Adult	3.02x10 ⁻⁵	8.35x10 ⁻⁵	1.26x10 ⁻⁷	1.47x10 ⁻⁷	4.01x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	1.96x10 ⁻⁷	2.64x10 ⁻⁶	1.93x10 ⁻⁶	1.41x10 ⁻⁶	9.92x10 ⁻⁷	8.50x10 ⁻⁷	1.32x10 ⁻⁴	2.55x10 ⁻⁶

TABLE 4.5-9 (Cont'd)
HUMAN INTAKES OF COPC FOR “REMEDIATION” SCENARIO – FUTURE 3

Silver mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	1.49x10 ⁻⁸	3.69x10 ⁻⁷	6.11x10 ⁻⁹	6.17x10 ⁻⁹	2.85x10 ⁻⁹	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.86x10 ⁻⁹	1.58x10 ⁻⁷	1.72x10 ⁻⁹	9.93x10 ⁻⁸	0.00	6.06x10 ⁻⁷	2.55x10 ⁻⁴	1.31x10 ⁻⁷
Camper 1 - Child	9.93x10 ⁻⁹	3.00x10 ⁻⁷	4.36x10 ⁻⁹	4.40x10 ⁻⁹	2.03x10 ⁻⁹	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.47x10 ⁻⁹	1.13x10 ⁻⁷	1.23x10 ⁻⁹	5.66x10 ⁻⁸	0.00	7.60x10 ⁻⁸	1.82x10 ⁻⁴	9.91x10 ⁻⁸
Camper 1 - Adult	8.67x10 ⁻⁹	1.72x10 ⁻⁷	2.74x10 ⁻⁹	2.77x10 ⁻⁹	1.28x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.18x10 ⁻⁹	7.08x10 ⁻⁸	7.71x10 ⁻¹⁰	2.41x10 ⁻⁸	9.02x10 ⁻⁹	3.54x10 ⁻⁸	1.14x10 ⁻⁴	7.57x10 ⁻⁸
Camper 3 - Toddler	1.49x10 ⁻⁸	3.69x10 ⁻⁷	4.42x10 ⁻⁹	4.17x10 ⁻⁹	2.85x10 ⁻⁹	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.86x10 ⁻⁹	1.29x10 ⁻⁷	1.72x10 ⁻⁹	4.36x10 ⁻⁸	0.00	6.06x10 ⁻⁷	2.55x10 ⁻⁴	1.31x10 ⁻⁷
Camper 3 - Child	9.93x10 ⁻⁹	3.00x10 ⁻⁷	3.16x10 ⁻⁹	2.98x10 ⁻⁹	2.03x10 ⁻⁹	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.47x10 ⁻⁹	9.21x10 ⁻⁸	1.23x10 ⁻⁹	2.48x10 ⁻⁸	0.00	7.60x10 ⁻⁸	1.82x10 ⁻⁴	9.91x10 ⁻⁸
Camper 3 - Adult	8.67x10 ⁻⁹	1.72x10 ⁻⁷	1.99x10 ⁻⁹	1.87x10 ⁻⁹	1.28x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.18x10 ⁻⁹	5.79x10 ⁻⁸	7.71x10 ⁻¹⁰	1.06x10 ⁻⁸	9.02x10 ⁻⁹	3.54x10 ⁻⁸	1.14x10 ⁻⁴	7.57x10 ⁻⁸
Camper 4 - Toddler	7.04x10 ⁻⁷	1.75x10 ⁻⁵	6.11x10 ⁻⁹	6.17x10 ⁻⁹	1.43x10 ⁻⁸	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.86x10 ⁻⁹	1.58x10 ⁻⁷	8.14x10 ⁻⁸	9.93x10 ⁻⁸	0.00	1.43x10 ⁻⁶	2.74x10 ⁻⁴	3.09x10 ⁻⁷
Camper 4 - Child	4.71x10 ⁻⁷	1.42x10 ⁻⁵	4.36x10 ⁻⁹	4.40x10 ⁻⁹	1.02x10 ⁻⁸	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.47x10 ⁻⁹	1.13x10 ⁻⁷	5.81x10 ⁻⁸	5.66x10 ⁻⁸	0.00	1.80x10 ⁻⁷	1.97x10 ⁻⁴	2.34x10 ⁻⁷
Camper 4 - Adult	4.11x10 ⁻⁷	8.17x10 ⁻⁶	2.74x10 ⁻⁹	2.77x10 ⁻⁹	6.43x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.18x10 ⁻⁹	7.08x10 ⁻⁸	3.65x10 ⁻⁸	2.41x10 ⁻⁸	9.02x10 ⁻⁹	8.36x10 ⁻⁸	1.23x10 ⁻⁴	1.79x10 ⁻⁷
Camper 5 - Toddler	1.77x10 ⁻⁶	4.42x10 ⁻⁵	4.42x10 ⁻⁹	4.17x10 ⁻⁹	3.40x10 ⁻⁸	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.86x10 ⁻⁹	1.29x10 ⁻⁷	2.05x10 ⁻⁷	4.36x10 ⁻⁸	0.00	6.06x10 ⁻⁷	3.01x10 ⁻⁴	1.31x10 ⁻⁷
Camper 5 - Child	1.19x10 ⁻⁶	3.59x10 ⁻⁵	3.16x10 ⁻⁹	2.98x10 ⁻⁹	2.42x10 ⁻⁸	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.47x10 ⁻⁹	9.21x10 ⁻⁸	1.46x10 ⁻⁷	2.48x10 ⁻⁸	0.00	7.60x10 ⁻⁸	2.19x10 ⁻⁴	9.91x10 ⁻⁸
Camper 5 - Adult	1.04x10 ⁻⁶	2.06x10 ⁻⁵	1.99x10 ⁻⁹	1.87x10 ⁻⁹	1.52x10 ⁻⁸	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.18x10 ⁻⁹	5.79x10 ⁻⁸	9.21x10 ⁻⁸	1.06x10 ⁻⁸	9.02x10 ⁻⁹	3.54x10 ⁻⁸	1.36x10 ⁻⁴	7.57x10 ⁻⁸

Thallium mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	0.00	0.00	1.77x10 ⁻⁸	6.69x10 ⁻⁸	4.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.79x10 ⁻⁸	0.00	2.21x10 ⁻⁸	0.00	0.00	4.10x10 ⁻⁶	0.00
Camper 1 - Child	0.00	0.00	1.26x10 ⁻⁸	4.78x10 ⁻⁸	3.22x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.99x10 ⁻⁸	0.00	1.26x10 ⁻⁸	0.00	0.00	2.92x10 ⁻⁶	0.00
Camper 1 - Adult	0.00	0.00	7.94x10 ⁻⁹	3.00x10 ⁻⁸	2.03x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.39x10 ⁻⁸	0.00	5.36x10 ⁻⁹	1.62x10 ⁻⁷	0.00	2.00x10 ⁻⁶	0.00
Camper 3 - Toddler	0.00	0.00	4.55x10 ⁻⁹	6.89x10 ⁻⁹	4.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.64x10 ⁻⁸	0.00	4.06x10 ⁻⁸	0.00	0.00	4.04x10 ⁻⁶	0.00
Camper 3 - Child	0.00	0.00	3.25x10 ⁻⁹	4.92x10 ⁻⁹	3.22x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.88x10 ⁻⁸	0.00	2.31x10 ⁻⁸	0.00	0.00	2.88x10 ⁻⁶	0.00
Camper 3 - Adult	0.00	0.00	2.04x10 ⁻⁹	3.09x10 ⁻⁹	2.03x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.33x10 ⁻⁸	0.00	9.88x10 ⁻⁹	1.62x10 ⁻⁷	0.00	1.97x10 ⁻⁶	0.00
Camper 4 - Toddler	0.00	0.00	1.77x10 ⁻⁸	6.69x10 ⁻⁸	3.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.79x10 ⁻⁸	0.00	2.21x10 ⁻⁸	0.00	0.00	4.10x10 ⁻⁶	0.00
Camper 4 - Child	0.00	0.00	1.26x10 ⁻⁸	4.78x10 ⁻⁸	2.51x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.99x10 ⁻⁸	0.00	1.26x10 ⁻⁸	0.00	0.00	2.92x10 ⁻⁶	0.00
Camper 4 - Adult	0.00	0.00	7.94x10 ⁻⁹	3.00x10 ⁻⁸	1.58x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.39x10 ⁻⁸	0.00	5.36x10 ⁻⁹	1.62x10 ⁻⁷	0.00	2.00x10 ⁻⁶	0.00
Camper 5 - Toddler	0.00	0.00	4.55x10 ⁻⁹	6.89x10 ⁻⁹	4.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.64x10 ⁻⁸	0.00	4.06x10 ⁻⁸	0.00	0.00	4.04x10 ⁻⁶	0.00
Camper 5 - Child	0.00	0.00	3.25x10 ⁻⁹	4.92x10 ⁻⁹	3.22x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.88x10 ⁻⁸	0.00	2.31x10 ⁻⁸	0.00	0.00	2.88x10 ⁻⁶	0.00
Camper 5 - Adult	0.00	0.00	2.04x10 ⁻⁹	3.09x10 ⁻⁹	2.03x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.33x10 ⁻⁸	0.00	9.88x10 ⁻⁹	1.62x10 ⁻⁷	0.00	1.97x10 ⁻⁶	0.00

TABLE 4.5-9 (Cont'd)
HUMAN INTAKES OF COPC FOR “REMEDIATION” SCENARIO – FUTURE 3

Tin mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	0.00	0.00	9.23x10 ⁻⁸	8.47x10 ⁻⁸	7.74x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	2.10x10 ⁻⁶	0.00	3.45x10 ⁻⁶	0.00	2.34x10 ⁻⁶	1.33x10 ⁻⁵	2.02x10 ⁻⁷
Camper 1 - Child	0.00	0.00	6.58x10 ⁻⁸	6.05x10 ⁻⁸	5.53x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	1.50x10 ⁻⁶	0.00	1.97x10 ⁻⁶	0.00	2.94x10 ⁻⁷	7.59x10 ⁻⁶	1.53x10 ⁻⁷
Camper 1 - Adult	0.00	0.00	4.14x10 ⁻⁸	3.80x10 ⁻⁸	3.48x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	9.42x10 ⁻⁷	0.00	8.39x10 ⁻⁷	1.80x10 ⁻⁷	1.37x10 ⁻⁷	4.51x10 ⁻⁶	1.17x10 ⁻⁷
Camper 3 - Toddler	0.00	0.00	2.18x10 ⁻⁷	1.58x10 ⁻⁷	7.74x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	4.69x10 ⁻⁶	0.00	2.03x10 ⁻⁷	0.00	3.04x10 ⁻⁶	1.35x10 ⁻⁵	2.62x10 ⁻⁷
Camper 3 - Child	0.00	0.00	1.55x10 ⁻⁷	1.13x10 ⁻⁷	5.53x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	3.35x10 ⁻⁶	0.00	1.16x10 ⁻⁷	0.00	3.81x10 ⁻⁷	7.82x10 ⁻⁶	1.99x10 ⁻⁷
Camper 3 - Adult	0.00	0.00	9.77x10 ⁻⁸	7.09x10 ⁻⁸	3.48x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	2.11x10 ⁻⁶	0.00	4.94x10 ⁻⁸	1.80x10 ⁻⁷	1.78x10 ⁻⁷	5.01x10 ⁻⁶	1.52x10 ⁻⁷
Camper 4 - Toddler	0.00	0.00	9.23x10 ⁻⁸	8.47x10 ⁻⁸	1.81x10 ⁻⁷	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	2.10x10 ⁻⁶	0.00	3.45x10 ⁻⁶	0.00	1.91x10 ⁻⁶	1.29x10 ⁻⁵	1.64x10 ⁻⁷
Camper 4 - Child	0.00	0.00	6.58x10 ⁻⁸	6.05x10 ⁻⁸	1.29x10 ⁻⁷	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	1.50x10 ⁻⁶	0.00	1.97x10 ⁻⁶	0.00	2.39x10 ⁻⁷	7.61x10 ⁻⁶	1.25x10 ⁻⁷
Camper 4 - Adult	0.00	0.00	4.14x10 ⁻⁸	3.80x10 ⁻⁸	8.12x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	9.42x10 ⁻⁷	0.00	8.39x10 ⁻⁷	1.80x10 ⁻⁷	1.11x10 ⁻⁷	4.53x10 ⁻⁶	9.52x10 ⁻⁸
Camper 5 - Toddler	0.00	0.00	2.18x10 ⁻⁷	1.58x10 ⁻⁷	7.74x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	4.69x10 ⁻⁶	0.00	2.03x10 ⁻⁷	0.00	4.73x10 ⁻⁶	1.52x10 ⁻⁵	4.08x10 ⁻⁷
Camper 5 - Child	0.00	0.00	1.55x10 ⁻⁷	1.13x10 ⁻⁷	5.53x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	3.35x10 ⁻⁶	0.00	1.16x10 ⁻⁷	0.00	5.93x10 ⁻⁷	8.03x10 ⁻⁶	3.10x10 ⁻⁷
Camper 5 - Adult	0.00	0.00	9.77x10 ⁻⁸	7.09x10 ⁻⁸	3.48x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	2.11x10 ⁻⁶	0.00	4.94x10 ⁻⁸	1.80x10 ⁻⁷	2.76x10 ⁻⁷	5.11x10 ⁻⁶	2.36x10 ⁻⁷

Zinc mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	8.71x10 ⁻⁵	6.73x10 ⁻³	5.68x10 ⁻⁴	3.54x10 ⁻⁴	4.30x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	5.46x10 ⁻³	2.01x10 ⁻³	2.06x10 ⁻⁴	5.63x10 ⁻⁵	0.00	4.45x10 ⁻⁴	2.13x10 ⁻¹	7.67x10 ⁻⁶
Camper 1 - Child	5.82x10 ⁻⁵	5.47x10 ⁻³	4.06x10 ⁻⁴	2.52x10 ⁻⁴	3.07x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	3.89x10 ⁻³	1.44x10 ⁻³	1.47x10 ⁻⁴	3.20x10 ⁻⁵	0.00	5.58x10 ⁻⁵	1.53x10 ⁻¹	5.83x10 ⁻⁶
Camper 1 - Adult	5.08x10 ⁻⁵	3.14x10 ⁻³	2.55x10 ⁻⁴	1.59x10 ⁻⁴	1.93x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.45x10 ⁻³	9.03x10 ⁻⁴	9.26x10 ⁻⁵	1.37x10 ⁻⁵	3.88x10 ⁻⁵	2.60x10 ⁻⁵	9.57x10 ⁻²	4.45x10 ⁻⁶
Camper 3 - Toddler	8.71x10 ⁻⁵	6.73x10 ⁻³	3.14x10 ⁻⁴	8.27x10 ⁻⁴	4.30x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	5.46x10 ⁻³	5.41x10 ⁻⁴	2.06x10 ⁻⁴	5.29x10 ⁻⁵	0.00	1.98x10 ⁻⁴	2.12x10 ⁻¹	3.42x10 ⁻⁶
Camper 3 - Child	5.82x10 ⁻⁵	5.47x10 ⁻³	2.24x10 ⁻⁴	5.90x10 ⁻⁴	3.07x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	3.89x10 ⁻³	3.86x10 ⁻⁴	1.47x10 ⁻⁴	3.01x10 ⁻⁵	0.00	2.49x10 ⁻⁵	1.52x10 ⁻¹	2.59x10 ⁻⁶
Camper 3 - Adult	5.08x10 ⁻⁵	3.14x10 ⁻³	1.41x10 ⁻⁴	3.71x10 ⁻⁴	1.93x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.45x10 ⁻³	2.43x10 ⁻⁴	9.26x10 ⁻⁵	1.29x10 ⁻⁵	3.88x10 ⁻⁵	1.16x10 ⁻⁵	9.51x10 ⁻²	1.98x10 ⁻⁶
Camper 4 - Toddler	7.49x10 ⁻³	5.79x10 ⁻¹	5.68x10 ⁻⁴	3.54x10 ⁻⁴	6.80x10 ⁻³	1.83x10 ⁻¹	1.37x10 ⁻²	5.46x10 ⁻³	2.01x10 ⁻³	1.78x10 ⁻²	5.63x10 ⁻⁵	0.00	7.48x10 ⁻⁴	8.17x10 ⁻¹	1.29x10 ⁻⁵
Camper 4 - Child	5.01x10 ⁻³	4.70x10 ⁻¹	4.06x10 ⁻⁴	2.52x10 ⁻⁴	4.86x10 ⁻³	1.31x10 ⁻¹	9.74x10 ⁻³	3.89x10 ⁻³	1.44x10 ⁻³	1.27x10 ⁻²	3.20x10 ⁻⁵	0.00	9.38x10 ⁻⁵	6.40x10 ⁻¹	9.79x10 ⁻⁶
Camper 4 - Adult	4.37x10 ⁻³	2.70x10 ⁻¹	2.55x10 ⁻⁴	1.59x10 ⁻⁴	3.05x10 ⁻³	8.23x10 ⁻²	6.13x10 ⁻³	2.45x10 ⁻³	9.03x10 ⁻⁴	7.97x10 ⁻³	1.37x10 ⁻⁵	3.88x10 ⁻⁵	4.36x10 ⁻⁵	3.78x10 ⁻¹	7.47x10 ⁻⁶
Camper 5 - Toddler	1.67x10 ⁻³	1.29x10 ⁻¹	3.14x10 ⁻⁴	8.27x10 ⁻⁴	1.76x10 ⁻³	1.83x10 ⁻¹	1.37x10 ⁻²	5.46x10 ⁻³	5.41x10 ⁻⁴	3.95x10 ⁻³	5.29x10 ⁻⁵	0.00	2.73x10 ⁻⁴	3.41x10 ⁻¹	4.70x10 ⁻⁶
Camper 5 - Child	1.11x10 ⁻³	1.05x10 ⁻¹	2.24x10 ⁻⁴	5.90x10 ⁻⁴	1.26x10 ⁻³	1.31x10 ⁻¹	9.74x10 ⁻³	3.89x10 ⁻³	3.86x10 ⁻⁴	2.82x10 ⁻³	3.01x10 ⁻⁵	0.00	3.42x10 ⁻⁵	2.56x10 ⁻¹	3.57x10 ⁻⁶
Camper 5 - Adult	9.72x10 ⁻⁴	6.01x10 ⁻²	1.41x10 ⁻⁴	3.71x10 ⁻⁴	7.91x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.45x10 ⁻³	2.43x10 ⁻⁴	1.77x10 ⁻³	1.29x10 ⁻⁵	3.88x10 ⁻⁵	1.59x10 ⁻⁵	1.55x10 ⁻¹	2.72x10 ⁻⁶

TABLE 4.5-10
PERCENTAGE BREAKDOWN BY PATHWAY FOR
“REMEDIATION” SCENARIO – FUTURE 3

Percent Intake by Pathway														
Arsenic	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	7.94%	35.41%	0.16%	0.15%	0.05%	9.86%	5.59%	0.05%	3.38%	1.50%	0.96%	n/a	34.03%	0.94%
Camper 1 - Child	9.76%	52.88%	0.20%	0.19%	0.06%	12.94%	7.34%	0.06%	4.44%	1.97%	1.00%	n/a	7.84%	1.31%
Camper 1 - Adult	13.90%	49.55%	0.21%	0.20%	0.06%	13.27%	7.52%	0.06%	4.55%	2.02%	0.70%	0.37%	5.95%	1.63%
Camper 3 - Toddler	10.06%	44.83%	0.09%	0.12%	0.06%	12.49%	7.08%	0.06%	1.74%	1.90%	2.39%	n/a	18.67%	0.51%
Camper 3 - Child	10.50%	56.88%	0.10%	0.14%	0.06%	13.91%	7.89%	0.06%	1.94%	2.12%	2.13%	n/a	3.65%	0.61%
Camper 3 - Adult	14.86%	53.00%	0.11%	0.14%	0.06%	14.19%	8.05%	0.07%	1.98%	2.16%	1.47%	0.40%	2.76%	0.76%
Camper 4 - Toddler	16.11%	71.82%	0.03%	0.02%	0.05%	1.61%	0.91%	0.01%	0.55%	3.04%	0.16%	n/a	5.54%	0.15%
Camper 4 - Child	14.47%	78.35%	0.02%	0.02%	0.05%	1.55%	0.88%	0.01%	0.53%	2.92%	0.12%	n/a	0.93%	0.16%
Camper 4 - Adult	20.35%	72.58%	0.02%	0.02%	0.05%	1.57%	0.89%	0.01%	0.54%	2.96%	0.08%	0.04%	0.70%	0.19%
Camper 5 - Toddler	15.37%	68.53%	0.02%	0.03%	0.04%	3.02%	1.71%	0.01%	0.42%	2.90%	0.58%	n/a	7.16%	0.20%
Camper 5 - Child	14.05%	76.11%	0.02%	0.03%	0.04%	2.94%	1.67%	0.01%	0.41%	2.83%	0.45%	n/a	1.23%	0.20%
Camper 5 - Adult	19.79%	70.57%	0.02%	0.03%	0.04%	2.99%	1.69%	0.01%	0.42%	2.88%	0.31%	0.08%	0.92%	0.25%

Cadmium	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	2.53%	39.14%	0.02%	0.00%	0.21%	50.60%	1.65%	0.00%	1.69%	2.24%	0.63%	n/a	1.26%	0.03%
Camper 1 - Child	2.28%	42.80%	0.02%	0.00%	0.20%	48.61%	1.58%	0.00%	1.63%	2.15%	0.48%	n/a	0.21%	0.04%
Camper 1 - Adult	3.26%	40.29%	0.02%	0.00%	0.20%	50.09%	1.63%	0.00%	1.68%	2.22%	0.34%	0.06%	0.16%	0.04%
Camper 3 - Toddler	2.55%	39.42%	0.02%	0.00%	0.21%	50.96%	1.66%	0.00%	1.46%	2.26%	0.25%	n/a	1.18%	0.03%
Camper 3 - Child	2.29%	43.03%	0.02%	0.00%	0.20%	48.88%	1.59%	0.00%	1.40%	2.16%	0.19%	n/a	0.20%	0.03%
Camper 3 - Adult	3.27%	40.48%	0.02%	0.00%	0.20%	50.32%	1.64%	0.00%	1.45%	2.23%	0.13%	0.07%	0.15%	0.04%
Camper 4 - Toddler	4.65%	71.92%	0.01%	0.00%	0.27%	17.09%	0.56%	0.00%	0.57%	4.12%	0.21%	n/a	0.59%	0.02%
Camper 4 - Child	3.99%	75.02%	0.01%	0.00%	0.25%	15.66%	0.51%	0.00%	0.52%	3.77%	0.15%	n/a	0.09%	0.02%
Camper 4 - Adult	5.83%	72.13%	0.01%	0.00%	0.27%	16.48%	0.54%	0.00%	0.55%	3.97%	0.11%	0.02%	0.07%	0.02%
Camper 5 - Toddler	4.29%	66.28%	0.01%	0.00%	0.27%	23.40%	0.76%	0.00%	0.67%	3.79%	0.11%	n/a	0.40%	0.01%
Camper 5 - Child	3.70%	69.50%	0.01%	0.00%	0.25%	21.56%	0.70%	0.00%	0.62%	3.50%	0.08%	n/a	0.06%	0.01%
Camper 5 - Adult	5.38%	66.55%	0.01%	0.00%	0.26%	22.59%	0.74%	0.00%	0.65%	3.66%	0.06%	0.03%	0.05%	0.01%

Copper	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.52%	25.31%	0.03%	0.03%	0.05%	62.76%	9.97%	0.04%	0.05%	0.04%	0.40%	n/a	0.75%	0.06%
Camper 1 - Child	0.47%	28.04%	0.02%	0.03%	0.05%	61.07%	9.70%	0.03%	0.05%	0.04%	0.31%	n/a	0.13%	0.07%
Camper 1 - Adult	0.67%	26.16%	0.03%	0.03%	0.05%	62.37%	9.90%	0.03%	0.05%	0.04%	0.21%	0.28%	0.10%	0.08%
Camper 3 - Toddler	0.52%	25.44%	0.02%	0.02%	0.05%	63.08%	10.02%	0.04%	0.04%	0.04%	0.37%	n/a	0.34%	0.03%
Camper 3 - Child	0.47%	28.08%	0.02%	0.02%	0.05%	61.17%	9.71%	0.03%	0.04%	0.04%	0.29%	n/a	0.06%	0.03%
Camper 3 - Adult	0.67%	26.20%	0.02%	0.02%	0.05%	62.46%	9.92%	0.03%	0.04%	0.04%	0.20%	0.28%	0.04%	0.04%
Camper 4 - Toddler	1.53%	74.94%	0.01%	0.01%	0.11%	19.59%	3.11%	0.01%	0.02%	0.12%	0.12%	n/a	0.41%	0.03%
Camper 4 - Child	1.30%	77.61%	0.01%	0.01%	0.10%	17.82%	2.83%	0.01%	0.01%	0.11%	0.09%	n/a	0.06%	0.03%
Camper 4 - Adult	1.93%	75.56%	0.01%	0.01%	0.10%	18.99%	3.02%	0.01%	0.02%	0.12%	0.07%	0.08%	0.05%	0.04%
Camper 5 - Toddler	0.80%	39.45%	0.01%	0.02%	0.07%	50.76%	8.06%	0.03%	0.03%	0.06%	0.30%	n/a	0.37%	0.03%
Camper 5 - Child	0.72%	42.76%	0.01%	0.02%	0.06%	48.32%	7.67%	0.03%	0.03%	0.06%	0.23%	n/a	0.06%	0.03%
Camper 5 - Adult	1.03%	40.39%	0.01%	0.02%	0.07%	49.96%	7.93%	0.03%	0.03%	0.06%	0.16%	0.22%	0.05%	0.04%

Lead	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	1.68%	8.21%	17.11%	19.57%	0.09%	3.11%	0.44%	0.00%	0.85%	0.02%	0.30%	n/a	48.38%	0.25%
Camper 1 - Child	2.57%	15.29%	28.00%	32.02%	0.15%	5.08%	0.72%	0.00%	1.40%	0.02%	0.39%	n/a	13.91%	0.44%
Camper 1 - Adult	3.69%	14.43%	28.94%	33.09%	0.16%	5.25%	0.74%	0.00%	1.45%	0.03%	0.28%	0.77%	10.63%	0.55%
Camper 3 - Toddler	6.44%	31.50%	7.95%	9.53%	0.35%	11.92%	1.69%	0.00%	0.39%	0.06%	0.39%	n/a	29.62%	0.15%
Camper 3 - Child	7.60%	45.12%	10.01%	11.99%	0.44%	15.00%	2.13%	0.01%	0.49%	0.07%	0.39%	n/a	6.55%	0.20%
Camper 3 - Adult	10.60%	41.44%	10.06%	12.06%	0.45%	15.08%	2.14%	0.01%	0.49%	0.07%	0.27%	2.21%	4.87%	0.25%
Camper 4 - Toddler	1.18%	5.79%	10.72%	12.26%	0.15%	1.95%	0.28%	0.00%	0.54%	0.01%	0.19%	n/a	66.59%	0.34%
Camper 4 - Child	2.42%	14.38%	23.41%	26.76%	0.33%	4.25%	0.60%	0.00%	1.17%	0.02%	0.33%	n/a	25.54%	0.80%
Camper 4 - Adult	3.58%	14.01%	24.97%	28.55%	0.35%	4.53%	0.64%	0.00%	1.25%	0.02%	0.24%	0.66%	20.16%	1.04%
Camper 5 - Toddler	8.43%	41.21%	4.82%	5.78%	0.41%	7.23%	1.02%	0.00%	0.24%	0.08%	0.24%	n/a	30.39%	0.16%
Camper 5 - Child	9.86%	58.58%	6.02%	7.21%	0.51%	9.02%	1.28%	0.00%	0.29%	0.10%	0.24%	n/a	6.67%	0.21%
Camper 5 - Adult	13.92%	54.44%	6.12%	7.34%	0.52%	9.18%	1.30%	0.00%	0.30%	0.10%	0.16%	1.34%	5.02%	0.26%

TABLE 4.5-10 (Cont'd)
PERCENTAGE BREAKDOWN BY PATHWAY FOR
“REMEDIATION” SCENARIO – FUTURE 3

Manganese	Ingestion													
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Dermal
Camper 1 - Toddler	2.56%	36.14%	0.06%	0.14%	0.14%	20.56%	5.69%	0.25%	0.17%	0.02%	21.60%	n/a	11.67%	1.01%
Camper 1 - Child	2.64%	45.25%	0.06%	0.15%	0.15%	22.61%	6.25%	0.28%	0.19%	0.02%	18.95%	n/a	2.26%	1.18%
Camper 1 - Adult	2.53%	28.57%	0.04%	0.10%	0.10%	15.63%	4.32%	0.19%	0.13%	0.01%	8.89%	37.32%	1.15%	0.99%
Camper 3 - Toddler	2.45%	34.57%	0.14%	0.18%	0.13%	19.67%	5.44%	0.24%	0.60%	0.02%	7.26%	n/a	26.99%	2.33%
Camper 3 - Child	2.84%	48.54%	0.17%	0.22%	0.16%	24.26%	6.71%	0.30%	0.73%	0.02%	7.14%	n/a	5.85%	3.05%
Camper 3 - Adult	2.59%	29.24%	0.11%	0.15%	0.11%	16.00%	4.42%	0.20%	0.48%	0.01%	3.20%	38.19%	2.85%	2.44%
Camper 4 - Toddler	6.02%	84.83%	0.01%	0.02%	0.10%	3.24%	0.90%	0.04%	0.03%	0.04%	3.41%	n/a	1.26%	0.11%
Camper 4 - Child	5.14%	88.08%	0.01%	0.02%	0.09%	2.96%	0.82%	0.04%	0.02%	0.04%	2.48%	n/a	0.20%	0.11%
Camper 4 - Adult	7.09%	79.97%	0.01%	0.02%	0.09%	2.94%	0.81%	0.04%	0.02%	0.04%	1.67%	7.02%	0.15%	0.13%
Camper 5 - Toddler	5.57%	78.46%	0.03%	0.04%	0.04%	4.82%	1.33%	0.06%	0.15%	0.04%	1.78%	n/a	7.08%	0.61%
Camper 5 - Child	5.00%	85.59%	0.03%	0.04%	0.04%	4.61%	1.28%	0.06%	0.14%	0.03%	1.36%	n/a	1.19%	0.62%
Camper 5 - Adult	6.61%	74.51%	0.03%	0.04%	0.04%	4.40%	1.22%	0.05%	0.13%	0.03%	0.88%	10.50%	0.84%	0.72%

Nickel	Ingestion													
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Dermal
Camper 1 - Toddler	7.62%	26.29%	0.39%	0.33%	0.49%	28.15%	4.47%	0.69%	9.09%	0.63%	7.61%	n/a	10.95%	3.30%
Camper 1 - Child	7.69%	32.25%	0.42%	0.35%	0.53%	30.33%	4.82%	0.74%	9.79%	0.68%	6.54%	n/a	2.07%	3.79%
Camper 1 - Adult	10.45%	28.85%	0.41%	0.35%	0.52%	29.70%	4.72%	0.73%	9.59%	0.67%	4.35%	3.68%	1.50%	4.50%
Camper 3 - Toddler	6.94%	23.96%	0.40%	0.47%	0.45%	25.65%	4.08%	0.63%	8.45%	0.58%	8.37%	n/a	15.38%	4.64%
Camper 3 - Child	7.32%	30.71%	0.45%	0.53%	0.50%	28.89%	4.59%	0.71%	9.52%	0.65%	7.52%	n/a	3.04%	5.56%
Camper 3 - Adult	9.99%	27.58%	0.45%	0.52%	0.49%	28.39%	4.51%	0.70%	9.36%	0.64%	5.02%	3.52%	2.21%	6.63%
Camper 4 - Toddler	16.07%	55.48%	0.15%	0.13%	0.34%	11.18%	1.78%	0.27%	3.61%	1.34%	3.02%	n/a	5.09%	1.53%
Camper 4 - Child	14.77%	61.94%	0.15%	0.13%	0.33%	10.97%	1.74%	0.27%	3.54%	1.31%	2.37%	n/a	0.88%	1.60%
Camper 4 - Adult	20.28%	55.98%	0.15%	0.13%	0.33%	10.85%	1.72%	0.27%	3.50%	1.30%	1.59%	1.34%	0.64%	1.92%
Camper 5 - Toddler	17.98%	62.05%	0.10%	0.11%	0.31%	6.19%	0.98%	0.15%	2.04%	1.49%	2.02%	n/a	5.05%	1.52%
Camper 5 - Child	16.36%	68.60%	0.09%	0.11%	0.30%	6.01%	0.95%	0.15%	1.98%	1.45%	1.56%	n/a	0.86%	1.57%
Camper 5 - Adult	22.53%	62.19%	0.09%	0.11%	0.30%	5.96%	0.95%	0.15%	1.96%	1.44%	1.05%	0.74%	0.63%	1.90%

Silver	Ingestion													
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Dermal
Camper 1 - Toddler	0.01%	0.14%	0.00%	0.00%	0.00%	96.20%	3.25%	0.00%	0.06%	0.00%	0.04%	n/a	0.24%	0.05%
Camper 1 - Child	0.01%	0.16%	0.00%	0.00%	0.00%	96.38%	3.25%	0.00%	0.06%	0.00%	0.03%	n/a	0.04%	0.05%
Camper 1 - Adult	0.01%	0.15%	0.00%	0.00%	0.00%	96.39%	3.25%	0.00%	0.06%	0.00%	0.02%	0.01%	0.03%	0.07%
Camper 3 - Toddler	0.01%	0.14%	0.00%	0.00%	0.00%	96.24%	3.25%	0.00%	0.05%	0.00%	0.02%	n/a	0.24%	0.05%
Camper 3 - Child	0.01%	0.16%	0.00%	0.00%	0.00%	96.41%	3.26%	0.00%	0.05%	0.00%	0.01%	n/a	0.04%	0.05%
Camper 3 - Adult	0.01%	0.15%	0.00%	0.00%	0.00%	96.41%	3.26%	0.00%	0.05%	0.00%	0.01%	0.01%	0.03%	0.07%
Camper 4 - Toddler	0.26%	6.38%	0.00%	0.00%	0.01%	89.57%	3.02%	0.00%	0.06%	0.03%	0.04%	n/a	0.52%	0.11%
Camper 4 - Child	0.24%	7.23%	0.00%	0.00%	0.01%	89.19%	3.01%	0.00%	0.06%	0.03%	0.03%	n/a	0.09%	0.12%
Camper 4 - Adult	0.33%	6.64%	0.00%	0.00%	0.01%	89.66%	3.03%	0.00%	0.06%	0.03%	0.02%	0.01%	0.07%	0.15%
Camper 5 - Toddler	0.59%	14.65%	0.00%	0.00%	0.01%	81.62%	2.76%	0.00%	0.04%	0.07%	0.01%	n/a	0.20%	0.04%
Camper 5 - Child	0.54%	16.38%	0.00%	0.00%	0.01%	80.15%	2.71%	0.00%	0.04%	0.07%	0.01%	n/a	0.03%	0.05%
Camper 5 - Adult	0.76%	15.15%	0.00%	0.00%	0.01%	81.13%	2.74%	0.00%	0.04%	0.07%	0.01%	0.01%	0.03%	0.06%

Thallium	Ingestion													
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Dermal
Camper 1 - Toddler	n/a	n/a	0.43%	1.63%	0.11%	86.98%	6.91%	1.01%	2.39%	n/a	0.54%	n/a	n/a	n/a
Camper 1 - Child	n/a	n/a	0.43%	1.63%	0.11%	87.08%	6.92%	1.01%	2.39%	n/a	0.43%	n/a	n/a	n/a
Camper 1 - Adult	n/a	n/a	0.40%	1.50%	0.10%	80.11%	6.36%	0.93%	2.20%	n/a	0.27%	8.12%	n/a	n/a
Camper 3 - Toddler	n/a	n/a	0.11%	0.17%	0.11%	88.19%	7.01%	1.02%	2.38%	n/a	1.00%	n/a	n/a	n/a
Camper 3 - Child	n/a	n/a	0.11%	0.17%	0.11%	88.37%	7.02%	1.02%	2.39%	n/a	0.80%	n/a	n/a	n/a
Camper 3 - Adult	n/a	n/a	0.10%	0.16%	0.10%	81.29%	6.46%	0.94%	2.20%	n/a	0.50%	8.24%	n/a	n/a
Camper 4 - Toddler	n/a	n/a	0.43%	1.63%	0.09%	87.00%	6.91%	1.01%	2.39%	n/a	0.54%	n/a	n/a	n/a
Camper 4 - Child	n/a	n/a	0.43%	1.63%	0.09%	87.10%	6.92%	1.01%	2.39%	n/a	0.43%	n/a	n/a	n/a
Camper 4 - Adult	n/a	n/a	0.40%	1.50%	0.08%	80.13%	6.37%	0.93%	2.20%	n/a	0.27%	8.13%	n/a	n/a
Camper 5 - Toddler	n/a	n/a	0.11%	0.17%	0.11%	88.19%	7.01%	1.02%	2.38%	n/a	1.00%	n/a	n/a	n/a
Camper 5 - Child	n/a	n/a	0.11%	0.17%	0.11%	88.37%	7.02%	1.02%	2.39%	n/a	0.80%	n/a	n/a	n/a
Camper 5 - Adult	n/a	n/a	0.10%	0.16%	0.10%	81.29%	6.46%	0.94%	2.20%	n/a	0.50%	8.24%	n/a	n/a

TABLE 4.5-10 (Cont'd)
PERCENTAGE BREAKDOWN BY PATHWAY FOR
“REMEDICATION” SCENARIO – FUTURE 3

Tin	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	n/a	n/a	0.69%	0.63%	0.58%	26.48%	8.41%	3.11%	15.59%	n/a	25.63%	n/a	17.39%	1.50%
Camper 1 - Child	n/a	n/a	0.85%	0.78%	0.71%	32.86%	10.44%	3.86%	19.34%	n/a	25.38%	n/a	3.79%	1.98%
Camper 1 - Adult	n/a	n/a	0.89%	0.82%	0.75%	34.59%	10.99%	4.06%	20.36%	n/a	18.14%	3.90%	2.95%	2.53%
Camper 3 - Toddler	n/a	n/a	1.58%	1.15%	0.56%	25.90%	8.23%	3.04%	34.07%	n/a	1.47%	n/a	22.10%	1.90%
Camper 3 - Child	n/a	n/a	1.94%	1.41%	0.69%	31.73%	10.08%	3.72%	41.75%	n/a	1.44%	n/a	4.76%	2.48%
Camper 3 - Adult	n/a	n/a	1.89%	1.37%	0.67%	30.98%	9.85%	3.64%	40.77%	n/a	0.96%	3.49%	3.44%	2.94%
Camper 4 - Toddler	n/a	n/a	0.70%	0.65%	1.38%	27.23%	8.65%	3.20%	16.03%	n/a	26.36%	n/a	14.55%	1.25%
Camper 4 - Child	n/a	n/a	0.85%	0.78%	1.67%	32.90%	10.46%	3.86%	19.37%	n/a	25.41%	n/a	3.09%	1.61%
Camper 4 - Adult	n/a	n/a	0.90%	0.82%	1.76%	34.60%	11.00%	4.06%	20.37%	n/a	18.14%	3.90%	2.40%	2.06%
Camper 5 - Toddler	n/a	n/a	1.39%	1.01%	0.50%	22.85%	7.26%	2.68%	30.07%	n/a	1.30%	n/a	30.32%	2.61%
Camper 5 - Child	n/a	n/a	1.86%	1.35%	0.66%	30.51%	9.69%	3.58%	40.14%	n/a	1.39%	n/a	7.11%	3.71%
Camper 5 - Adult	n/a	n/a	1.83%	1.33%	0.65%	29.93%	9.51%	3.51%	39.38%	n/a	0.92%	3.37%	5.16%	4.42%

Zinc	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.04%	3.16%	0.27%	0.17%	0.20%	85.93%	6.40%	2.56%	0.94%	0.10%	0.03%	n/a	0.21%	0.004%
Camper 1 - Child	0.04%	3.58%	0.27%	0.17%	0.20%	85.71%	6.38%	2.55%	0.94%	0.10%	0.02%	n/a	0.04%	0.004%
Camper 1 - Adult	0.05%	3.28%	0.27%	0.17%	0.20%	85.94%	6.40%	2.56%	0.94%	0.10%	0.01%	0.04%	0.03%	0.005%
Camper 3 - Toddler	0.04%	3.18%	0.15%	0.39%	0.20%	86.54%	6.45%	2.58%	0.26%	0.10%	0.02%	n/a	0.09%	0.002%
Camper 3 - Child	0.04%	3.61%	0.15%	0.39%	0.20%	86.24%	6.42%	2.57%	0.25%	0.10%	0.02%	n/a	0.02%	0.002%
Camper 3 - Adult	0.05%	3.30%	0.15%	0.39%	0.20%	86.47%	6.44%	2.57%	0.26%	0.10%	0.01%	0.04%	0.01%	0.002%
Camper 4 - Toddler	0.92%	70.85%	0.07%	0.04%	0.83%	22.43%	1.67%	0.67%	0.25%	2.17%	0.01%	n/a	0.09%	0.002%
Camper 4 - Child	0.78%	73.54%	0.06%	0.04%	0.76%	20.45%	1.52%	0.61%	0.22%	1.98%	0.01%	n/a	0.01%	0.002%
Camper 4 - Adult	1.16%	71.51%	0.07%	0.04%	0.81%	21.77%	1.62%	0.65%	0.24%	2.11%	0.00%	0.01%	0.01%	0.002%
Camper 5 - Toddler	0.49%	37.81%	0.09%	0.24%	0.52%	53.82%	4.01%	1.60%	0.16%	1.16%	0.02%	n/a	0.08%	0.001%
Camper 5 - Child	0.44%	40.94%	0.09%	0.23%	0.49%	51.19%	3.81%	1.52%	0.15%	1.10%	0.01%	n/a	0.01%	0.001%
Camper 5 - Adult	0.63%	38.70%	0.09%	0.24%	0.51%	52.97%	3.95%	1.58%	0.16%	1.14%	0.01%	0.02%	0.01%	0.002%

4.5.4 “Treat All Flows” Scenario

The predicted intakes of the COPC for the various receptors are provided on Table 4.5-11 for the “Treat All Flows” scenario. In this scenario, the predicted intakes are similar to the “Remediation” Future 2 scenario with Campers 4 and 5 being the most exposed individuals. For lead exposures, Camper 4 has higher exposures than Camper 5 due to ingestion of soil. Soil represents 67% of the exposure for a Camper 4 toddler and 26% for a Camper 4 child whereas it only represents 30% for a Camper 5 toddler and 7% for a Camper 4 child (see Table 4.5-12). Consumption of fish and moose are the highest pathways of exposure for the other COPC (see Table 4.5-12).

Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

**TABLE 4.5-11
HUMAN INTAKES OF COPC FOR “TREAT ALL FLOWS” SCENARIO**

Intake by Pathway															
Arsenic mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	2.71x10 ⁻⁶	1.21x10 ⁻⁵	5.63x10 ⁻⁸	5.24x10 ⁻⁸	1.60x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.65x10 ⁻⁸	1.22x10 ⁻⁶	5.13x10 ⁻⁷	3.46x10 ⁻⁷	0.00	1.23x10 ⁻⁵	3.49x10 ⁻⁵	3.39x10 ⁻⁷
Camper 1 - Child	1.81x10 ⁻⁶	9.82x10 ⁻⁶	4.02x10 ⁻⁸	3.74x10 ⁻⁸	1.14x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.18x10 ⁻⁸	8.71x10 ⁻⁷	3.66x10 ⁻⁷	1.97x10 ⁻⁷	0.00	1.54x10 ⁻⁶	1.87x10 ⁻⁵	2.58x10 ⁻⁷
Camper 1 - Adult	1.58x10 ⁻⁶	5.64x10 ⁻⁶	2.53x10 ⁻⁸	2.35x10 ⁻⁸	7.17x10 ⁻⁹	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.42x10 ⁻⁹	5.48x10 ⁻⁷	2.30x10 ⁻⁷	8.41x10 ⁻⁸	4.51x10 ⁻⁸	7.18x10 ⁻⁷	1.14x10 ⁻⁵	1.97x10 ⁻⁷
Camper 3 - Toddler	2.71x10 ⁻⁶	1.21x10 ⁻⁵	2.65x10 ⁻⁸	3.48x10 ⁻⁸	1.60x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.65x10 ⁻⁸	4.97x10 ⁻⁷	5.13x10 ⁻⁷	6.84x10 ⁻⁷	0.00	5.33x10 ⁻⁶	2.75x10 ⁻⁵	1.47x10 ⁻⁷
Camper 3 - Child	1.81x10 ⁻⁶	9.82x10 ⁻⁶	1.89x10 ⁻⁸	2.48x10 ⁻⁸	1.14x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.18x10 ⁻⁸	3.55x10 ⁻⁷	3.66x10 ⁻⁷	3.89x10 ⁻⁷	0.00	6.68x10 ⁻⁷	1.75x10 ⁻⁵	1.12x10 ⁻⁷
Camper 3 - Adult	1.58x10 ⁻⁶	5.64x10 ⁻⁶	1.19x10 ⁻⁸	1.56x10 ⁻⁸	7.17x10 ⁻⁹	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.42x10 ⁻⁹	2.23x10 ⁻⁷	2.30x10 ⁻⁷	1.66x10 ⁻⁷	4.51x10 ⁻⁸	3.11x10 ⁻⁷	1.08x10 ⁻⁵	8.52x10 ⁻⁸
Camper 4 - Toddler	6.56x10 ⁻⁶	2.92x10 ⁻⁵	5.63x10 ⁻⁸	5.24x10 ⁻⁸	4.37x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.65x10 ⁻⁸	1.22x10 ⁻⁶	1.24x10 ⁻⁶	3.46x10 ⁻⁷	0.00	1.22x10 ⁻⁵	5.66x10 ⁻⁵	3.37x10 ⁻⁷
Camper 4 - Child	4.39x10 ⁻⁶	2.38x10 ⁻⁵	4.02x10 ⁻⁸	3.74x10 ⁻⁸	3.12x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.18x10 ⁻⁸	8.71x10 ⁻⁷	8.85x10 ⁻⁷	1.97x10 ⁻⁷	0.00	1.53x10 ⁻⁶	3.57x10 ⁻⁵	2.56x10 ⁻⁷
Camper 4 - Adult	3.83x10 ⁻⁶	1.37x10 ⁻⁵	2.53x10 ⁻⁸	2.35x10 ⁻⁸	1.96x10 ⁻⁸	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.42x10 ⁻⁹	5.48x10 ⁻⁷	5.56x10 ⁻⁷	8.41x10 ⁻⁸	4.51x10 ⁻⁸	7.14x10 ⁻⁷	2.20x10 ⁻⁵	1.96x10 ⁻⁷
Camper 5 - Toddler	1.77x10 ⁻⁵	7.90x10 ⁻⁵	2.65x10 ⁻⁸	3.48x10 ⁻⁸	4.90x10 ⁻⁸	3.57x10 ⁻⁶	2.02x10 ⁻⁶	1.65x10 ⁻⁸	4.97x10 ⁻⁷	3.35x10 ⁻⁶	6.84x10 ⁻⁷	0.00	8.47x10 ⁻⁶	1.15x10 ⁻⁴	2.33x10 ⁻⁷
Camper 5 - Child	1.19x10 ⁻⁵	6.42x10 ⁻⁵	1.89x10 ⁻⁸	2.48x10 ⁻⁸	3.50x10 ⁻⁸	2.55x10 ⁻⁶	1.44x10 ⁻⁶	1.18x10 ⁻⁸	3.55x10 ⁻⁷	2.39x10 ⁻⁶	3.89x10 ⁻⁷	0.00	1.06x10 ⁻⁶	8.43x10 ⁻⁵	1.77x10 ⁻⁷
Camper 5 - Adult	1.03x10 ⁻⁵	3.69x10 ⁻⁵	1.19x10 ⁻⁸	1.56x10 ⁻⁸	2.20x10 ⁻⁸	1.60x10 ⁻⁶	9.07x10 ⁻⁷	7.42x10 ⁻⁹	2.23x10 ⁻⁷	1.50x10 ⁻⁶	1.66x10 ⁻⁷	4.51x10 ⁻⁸	4.94x10 ⁻⁷	5.22x10 ⁻⁵	1.35x10 ⁻⁷

Cadmium mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	2.28x10 ⁻⁶	3.52x10 ⁻⁵	1.76x10 ⁻⁸	2.97x10 ⁻⁹	1.86x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.69x10 ⁻⁹	1.56x10 ⁻⁶	2.02x10 ⁻⁶	5.78x10 ⁻⁷	0.00	1.16x10 ⁻⁶	9.11x10 ⁻⁵	3.20x10 ⁻⁸
Camper 1 - Child	1.52x10 ⁻⁶	2.86x10 ⁻⁵	1.26x10 ⁻⁸	2.12x10 ⁻⁹	1.33x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.21x10 ⁻⁹	1.11x10 ⁻⁶	1.44x10 ⁻⁶	3.29x10 ⁻⁷	0.00	1.45x10 ⁻⁷	6.76x10 ⁻⁵	2.43x10 ⁻⁸
Camper 1 - Adult	1.33x10 ⁻⁶	1.64x10 ⁻⁵	7.90x10 ⁻⁹	1.33x10 ⁻⁹	8.36x10 ⁻⁸	2.09x10 ⁻⁵	6.81x10 ⁻⁷	7.60x10 ⁻¹⁰	6.99x10 ⁻⁷	9.05x10 ⁻⁷	1.40x10 ⁻⁷	2.71x10 ⁻⁸	6.76x10 ⁻⁸	4.13x10 ⁻⁵	1.85x10 ⁻⁸
Camper 3 - Toddler	2.28x10 ⁻⁶	3.52x10 ⁻⁵	1.50x10 ⁻⁸	2.32x10 ⁻⁹	1.86x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.69x10 ⁻⁹	1.34x10 ⁻⁶	2.02x10 ⁻⁶	2.25x10 ⁻⁷	0.00	1.08x10 ⁻⁶	9.04x10 ⁻⁵	2.98x10 ⁻⁸
Camper 3 - Child	1.52x10 ⁻⁶	2.86x10 ⁻⁵	1.07x10 ⁻⁸	1.65x10 ⁻⁹	1.33x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.21x10 ⁻⁹	9.55x10 ⁻⁷	1.44x10 ⁻⁶	1.28x10 ⁻⁷	0.00	1.36x10 ⁻⁷	6.73x10 ⁻⁵	2.26x10 ⁻⁸
Camper 3 - Adult	1.33x10 ⁻⁶	1.64x10 ⁻⁵	6.72x10 ⁻⁹	1.04x10 ⁻⁹	8.36x10 ⁻⁸	2.09x10 ⁻⁵	6.81x10 ⁻⁷	7.60x10 ⁻¹⁰	6.01x10 ⁻⁷	9.05x10 ⁻⁷	5.47x10 ⁻⁸	2.71x10 ⁻⁸	6.31x10 ⁻⁸	4.11x10 ⁻⁵	1.73x10 ⁻⁸
Camper 4 - Toddler	3.33x10 ⁻⁶	5.14x10 ⁻⁵	1.76x10 ⁻⁸	2.97x10 ⁻⁹	2.13x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.69x10 ⁻⁹	1.56x10 ⁻⁶	2.94x10 ⁻⁶	5.78x10 ⁻⁷	0.00	1.60x10 ⁻⁶	1.10x10 ⁻⁴	4.42x10 ⁻⁸
Camper 4 - Child	2.22x10 ⁻⁶	4.18x10 ⁻⁵	1.26x10 ⁻⁸	2.12x10 ⁻⁹	1.52x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.21x10 ⁻⁹	1.11x10 ⁻⁶	2.10x10 ⁻⁶	3.29x10 ⁻⁷	0.00	2.01x10 ⁻⁷	8.22x10 ⁻⁵	3.36x10 ⁻⁸
Camper 4 - Adult	1.94x10 ⁻⁶	2.40x10 ⁻⁵	7.90x10 ⁻⁹	1.33x10 ⁻⁹	9.58x10 ⁻⁸	2.09x10 ⁻⁵	6.81x10 ⁻⁷	7.60x10 ⁻¹⁰	6.99x10 ⁻⁷	1.32x10 ⁻⁶	1.40x10 ⁻⁷	2.71x10 ⁻⁸	9.36x10 ⁻⁸	4.99x10 ⁻⁵	2.56x10 ⁻⁸
Camper 5 - Toddler	7.01x10 ⁻⁶	1.08x10 ⁻⁴	1.50x10 ⁻⁸	2.32x10 ⁻⁹	4.57x10 ⁻⁷	4.66x10 ⁻⁵	1.52x10 ⁻⁶	1.69x10 ⁻⁹	1.34x10 ⁻⁶	6.20x10 ⁻⁶	2.25x10 ⁻⁷	0.00	7.89x10 ⁻⁷	1.72x10 ⁻⁴	2.18x10 ⁻⁸
Camper 5 - Child	4.69x10 ⁻⁶	8.81x10 ⁻⁵	1.07x10 ⁻⁸	1.65x10 ⁻⁹	3.26x10 ⁻⁷	3.32x10 ⁻⁵	1.08x10 ⁻⁶	1.21x10 ⁻⁹	9.55x10 ⁻⁷	4.43x10 ⁻⁶	1.28x10 ⁻⁷	0.00	9.89x10 ⁻⁸	1.33x10 ⁻⁴	1.65x10 ⁻⁸
Camper 5 - Adult	4.09x10 ⁻⁶	5.06x10 ⁻⁵	6.72x10 ⁻⁹	1.04x10 ⁻⁹	2.05x10 ⁻⁷	2.09x10 ⁻⁵	6.81x10 ⁻⁷	7.60x10 ⁻¹⁰	6.01x10 ⁻⁷	2.78x10 ⁻⁶	5.47x10 ⁻⁸	2.71x10 ⁻⁸	4.60x10 ⁻⁸	8.00x10 ⁻⁵	1.26x10 ⁻⁸

TABLE 4.5-11 (Cont'd)
HUMAN INTAKES OF COPC FOR “TREAT ALL FLOWS” SCENARIO

Copper mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	2.26x10 ⁻⁵	1.11x10 ⁻³	1.17x10 ⁻⁶	1.40x10 ⁻⁶	2.24x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.64x10 ⁻⁶	2.34x10 ⁻⁶	1.81x10 ⁻⁶	1.85x10 ⁻⁵	0.00	3.49x10 ⁻⁵	4.58x10 ⁻³	3.00x10 ⁻⁶
Camper 1 - Child	1.51x10 ⁻⁵	9.01x10 ⁻⁴	8.34x10 ⁻⁷	1.00x10 ⁻⁶	1.60x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.17x10 ⁻⁶	1.67x10 ⁻⁶	1.29x10 ⁻⁶	1.05x10 ⁻⁵	0.00	4.37x10 ⁻⁶	3.36x10 ⁻³	2.28x10 ⁻⁶
Camper 1 - Adult	1.32x10 ⁻⁵	5.18x10 ⁻⁴	5.25x10 ⁻⁷	6.30x10 ⁻⁷	1.01x10 ⁻⁶	1.31x10 ⁻³	2.08x10 ⁻⁴	7.34x10 ⁻⁷	1.05x10 ⁻⁶	8.10x10 ⁻⁷	4.50x10 ⁻⁶	5.86x10 ⁻⁶	2.03x10 ⁻⁶	2.07x10 ⁻³	1.74x10 ⁻⁶
Camper 3 - Toddler	2.26x10 ⁻⁵	1.11x10 ⁻³	7.61x10 ⁻⁷	9.36x10 ⁻⁷	2.24x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.64x10 ⁻⁶	1.70x10 ⁻⁶	1.81x10 ⁻⁶	1.72x10 ⁻⁵	0.00	1.58x10 ⁻⁵	4.56x10 ⁻³	1.36x10 ⁻⁶
Camper 3 - Child	1.51x10 ⁻⁵	9.01x10 ⁻⁴	5.43x10 ⁻⁷	6.68x10 ⁻⁷	1.60x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.17x10 ⁻⁶	1.21x10 ⁻⁶	1.29x10 ⁻⁶	9.78x10 ⁻⁶	0.00	1.98x10 ⁻⁶	3.35x10 ⁻³	1.03x10 ⁻⁶
Camper 3 - Adult	1.32x10 ⁻⁵	5.18x10 ⁻⁴	3.41x10 ⁻⁷	4.20x10 ⁻⁷	1.01x10 ⁻⁶	1.31x10 ⁻³	2.08x10 ⁻⁴	7.34x10 ⁻⁷	7.61x10 ⁻⁷	8.10x10 ⁻⁷	4.17x10 ⁻⁶	5.86x10 ⁻⁶	9.23x10 ⁻⁷	2.07x10 ⁻³	7.90x10 ⁻⁷
Camper 4 - Toddler	2.07x10 ⁻⁵	1.02x10 ⁻³	1.17x10 ⁻⁶	1.40x10 ⁻⁶	1.96x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.64x10 ⁻⁶	2.34x10 ⁻⁶	1.65x10 ⁻⁶	1.85x10 ⁻⁵	0.00	6.05x10 ⁻⁵	4.51x10 ⁻³	5.21x10 ⁻⁶
Camper 4 - Child	1.38x10 ⁻⁵	8.25x10 ⁻⁴	8.34x10 ⁻⁷	1.00x10 ⁻⁶	1.40x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.17x10 ⁻⁶	1.67x10 ⁻⁶	1.18x10 ⁻⁶	1.05x10 ⁻⁵	0.00	7.58x10 ⁻⁶	3.28x10 ⁻³	3.95x10 ⁻⁶
Camper 4 - Adult	1.21x10 ⁻⁵	4.74x10 ⁻⁴	5.25x10 ⁻⁷	6.30x10 ⁻⁷	8.79x10 ⁻⁷	1.31x10 ⁻³	2.08x10 ⁻⁴	7.34x10 ⁻⁷	1.05x10 ⁻⁶	7.42x10 ⁻⁷	4.50x10 ⁻⁶	5.86x10 ⁻⁶	3.53x10 ⁻⁶	2.02x10 ⁻³	3.02x10 ⁻⁶
Camper 5 - Toddler	6.38x10 ⁻⁵	3.13x10 ⁻³	7.61x10 ⁻⁷	9.36x10 ⁻⁷	4.97x10 ⁻⁶	2.92x10 ⁻³	4.64x10 ⁻⁴	1.64x10 ⁻⁶	1.70x10 ⁻⁶	5.10x10 ⁻⁶	1.72x10 ⁻⁵	0.00	2.12x10 ⁻⁵	6.63x10 ⁻³	1.83x10 ⁻⁶
Camper 5 - Child	4.27x10 ⁻⁵	2.54x10 ⁻³	5.43x10 ⁻⁷	6.68x10 ⁻⁷	3.55x10 ⁻⁶	2.09x10 ⁻³	3.31x10 ⁻⁴	1.17x10 ⁻⁶	1.21x10 ⁻⁶	3.64x10 ⁻⁶	9.78x10 ⁻⁶	0.00	2.66x10 ⁻⁶	5.03x10 ⁻³	1.39x10 ⁻⁶
Camper 5 - Adult	3.72x10 ⁻⁵	1.46x10 ⁻³	3.41x10 ⁻⁷	4.20x10 ⁻⁷	2.23x10 ⁻⁶	1.31x10 ⁻³	2.08x10 ⁻⁴	7.34x10 ⁻⁷	7.61x10 ⁻⁷	2.29x10 ⁻⁶	4.17x10 ⁻⁶	5.86x10 ⁻⁶	1.24x10 ⁻⁶	3.04x10 ⁻³	1.06x10 ⁻⁶

Lead mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	1.93x10 ⁻⁵	9.42x10 ⁻⁵	1.96x10 ⁻⁴	2.25x10 ⁻⁴	1.06x10 ⁻⁶	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.24x10 ⁻⁸	9.81x10 ⁻⁶	1.74x10 ⁻⁷	3.45x10 ⁻⁶	0.00	5.55x10 ⁻⁴	1.15x10 ⁻³	2.87x10 ⁻⁶
Camper 1 - Child	1.29x10 ⁻⁵	7.65x10 ⁻⁵	1.40x10 ⁻⁴	1.60x10 ⁻⁴	7.54x10 ⁻⁷	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.88x10 ⁻⁹	7.00x10 ⁻⁶	1.24x10 ⁻⁷	1.96x10 ⁻⁶	0.00	6.96x10 ⁻⁵	4.99x10 ⁻⁴	2.18x10 ⁻⁶
Camper 1 - Adult	1.12x10 ⁻⁵	4.40x10 ⁻⁵	8.82x10 ⁻⁵	1.01x10 ⁻⁴	4.74x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.58x10 ⁻⁹	4.40x10 ⁻⁶	7.81x10 ⁻⁸	8.39x10 ⁻⁷	2.34x10 ⁻⁶	3.24x10 ⁻⁵	3.03x10 ⁻⁴	1.66x10 ⁻⁶
Camper 3 - Toddler	1.93x10 ⁻⁵	9.42x10 ⁻⁵	2.38x10 ⁻⁵	2.85x10 ⁻⁵	1.06x10 ⁻⁶	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.24x10 ⁻⁸	1.17x10 ⁻⁶	1.74x10 ⁻⁷	1.16x10 ⁻⁶	0.00	8.86x10 ⁻⁵	2.99x10 ⁻⁴	4.58x10 ⁻⁷
Camper 3 - Child	1.29x10 ⁻⁵	7.65x10 ⁻⁵	1.70x10 ⁻⁵	2.04x10 ⁻⁵	7.54x10 ⁻⁷	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.88x10 ⁻⁹	8.31x10 ⁻⁷	1.24x10 ⁻⁷	6.63x10 ⁻⁷	0.00	1.11x10 ⁻⁵	1.69x10 ⁻⁴	3.48x10 ⁻⁷
Camper 3 - Adult	1.12x10 ⁻⁵	4.40x10 ⁻⁵	1.07x10 ⁻⁵	1.28x10 ⁻⁵	4.74x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.58x10 ⁻⁹	5.23x10 ⁻⁷	7.81x10 ⁻⁸	2.83x10 ⁻⁷	2.34x10 ⁻⁶	5.17x10 ⁻⁶	1.06x10 ⁻⁴	2.66x10 ⁻⁷
Camper 4 - Toddler	1.95x10 ⁻⁵	9.52x10 ⁻⁵	1.96x10 ⁻⁴	2.25x10 ⁻⁴	2.63x10 ⁻⁶	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.24x10 ⁻⁸	9.81x10 ⁻⁶	1.76x10 ⁻⁷	3.45x10 ⁻⁶	0.00	1.22x10 ⁻³	1.81x10 ⁻³	6.31x10 ⁻⁶
Camper 4 - Child	1.30x10 ⁻⁵	7.73x10 ⁻⁵	1.40x10 ⁻⁴	1.60x10 ⁻⁴	1.88x10 ⁻⁶	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.88x10 ⁻⁹	7.00x10 ⁻⁶	1.25x10 ⁻⁷	1.96x10 ⁻⁶	0.00	1.53x10 ⁻⁴	5.84x10 ⁻⁴	4.79x10 ⁻⁶
Camper 4 - Adult	1.14x10 ⁻⁵	4.44x10 ⁻⁵	8.82x10 ⁻⁵	1.01x10 ⁻⁴	1.18x10 ⁻⁶	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.58x10 ⁻⁹	4.40x10 ⁻⁶	7.89x10 ⁻⁸	8.39x10 ⁻⁷	2.34x10 ⁻⁶	7.12x10 ⁻⁵	3.43x10 ⁻⁴	3.66x10 ⁻⁶
Camper 5 - Toddler	4.21x10 ⁻⁵	2.06x10 ⁻⁴	2.38x10 ⁻⁵	2.85x10 ⁻⁵	2.05x10 ⁻⁶	3.57x10 ⁻⁵	5.05x10 ⁻⁶	1.24x10 ⁻⁸	1.17x10 ⁻⁶	3.80x10 ⁻⁷	1.16x10 ⁻⁶	0.00	1.50x10 ⁻⁴	4.96x10 ⁻⁴	7.75x10 ⁻⁷
Camper 5 - Child	2.82x10 ⁻⁵	1.67x10 ⁻⁴	1.70x10 ⁻⁵	2.04x10 ⁻⁵	1.46x10 ⁻⁶	2.55x10 ⁻⁵	3.61x10 ⁻⁶	8.88x10 ⁻⁹	8.31x10 ⁻⁷	2.71x10 ⁻⁷	6.63x10 ⁻⁷	0.00	1.88x10 ⁻⁵	2.84x10 ⁻⁴	5.89x10 ⁻⁷
Camper 5 - Adult	2.46x10 ⁻⁵	9.61x10 ⁻⁵	1.07x10 ⁻⁵	1.28x10 ⁻⁵	9.20x10 ⁻⁷	1.60x10 ⁻⁵	2.27x10 ⁻⁶	5.58x10 ⁻⁹	5.23x10 ⁻⁷	1.71x10 ⁻⁷	2.83x10 ⁻⁷	2.34x10 ⁻⁶	8.75x10 ⁻⁶	1.75x10 ⁻⁴	4.50x10 ⁻⁷

TABLE 4.5-11 (Cont'd)
HUMAN INTAKES OF COPC FOR “TREAT ALL FLOWS” SCENARIO

Manganese mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	6.53x10 ⁻⁵	9.20x10 ⁻⁴	1.62x10 ⁻⁶	3.83x10 ⁻⁶	3.75x10 ⁻⁶	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.04x10 ⁻⁶	4.77x10 ⁻⁶	4.23x10 ⁻⁷	5.99x10 ⁻⁴	0.00	3.24x10 ⁻⁴	2.66x10 ⁻³	2.79x10 ⁻⁵
Camper 1 - Child	4.37x10 ⁻⁵	7.47x10 ⁻⁴	1.15x10 ⁻⁶	2.73x10 ⁻⁶	2.68x10 ⁻⁶	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.03x10 ⁻⁶	3.41x10 ⁻⁶	3.02x10 ⁻⁷	3.41x10 ⁻⁴	0.00	4.06x10 ⁻⁵	1.71x10 ⁻³	2.12x10 ⁻⁵
Camper 1 - Adult	3.81x10 ⁻⁵	4.29x10 ⁻⁴	7.26x10 ⁻⁷	1.72x10 ⁻⁶	1.68x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.16x10 ⁻⁶	2.14x10 ⁻⁶	1.90x10 ⁻⁷	1.46x10 ⁻⁴	6.11x10 ⁻⁴	1.89x10 ⁻⁵	1.58x10 ⁻³	1.62x10 ⁻⁵
Camper 3 - Toddler	6.53x10 ⁻⁵	9.20x10 ⁻⁴	4.09x10 ⁻⁶	5.26x10 ⁻⁶	3.75x10 ⁻⁶	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.04x10 ⁻⁶	1.73x10 ⁻⁵	4.23x10 ⁻⁷	2.10x10 ⁻⁴	0.00	7.83x10 ⁻⁴	2.74x10 ⁻³	6.75x10 ⁻⁵
Camper 3 - Child	4.37x10 ⁻⁵	7.47x10 ⁻⁴	2.92x10 ⁻⁶	3.75x10 ⁻⁶	2.68x10 ⁻⁶	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.03x10 ⁻⁶	1.23x10 ⁻⁵	3.02x10 ⁻⁷	1.20x10 ⁻⁴	0.00	9.82x10 ⁻⁵	1.56x10 ⁻³	5.12x10 ⁻⁵
Camper 3 - Adult	3.81x10 ⁻⁵	4.29x10 ⁻⁴	1.84x10 ⁻⁶	2.36x10 ⁻⁶	1.68x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.16x10 ⁻⁶	7.75x10 ⁻⁶	1.90x10 ⁻⁷	5.12x10 ⁻⁵	6.11x10 ⁻⁴	4.57x10 ⁻⁵	1.52x10 ⁻³	3.91x10 ⁻⁵
Camper 4 - Toddler	1.33x10 ⁻⁴	1.87x10 ⁻³	1.62x10 ⁻⁶	3.83x10 ⁻⁶	1.57x10 ⁻⁵	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.04x10 ⁻⁶	4.77x10 ⁻⁶	8.58x10 ⁻⁷	5.99x10 ⁻⁴	0.00	2.22x10 ⁻⁴	3.59x10 ⁻³	1.92x10 ⁻⁵
Camper 4 - Child	8.87x10 ⁻⁵	1.52x10 ⁻³	1.15x10 ⁻⁶	2.73x10 ⁻⁶	1.12x10 ⁻⁵	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.03x10 ⁻⁶	3.41x10 ⁻⁶	6.13x10 ⁻⁷	3.41x10 ⁻⁴	0.00	2.79x10 ⁻⁵	2.52x10 ⁻³	1.45x10 ⁻⁵
Camper 4 - Adult	7.74x10 ⁻⁵	8.72x10 ⁻⁴	7.26x10 ⁻⁷	1.72x10 ⁻⁶	7.02x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.16x10 ⁻⁶	2.14x10 ⁻⁶	3.85x10 ⁻⁷	1.46x10 ⁻⁴	6.11x10 ⁻⁴	1.30x10 ⁻⁵	2.06x10 ⁻³	1.11x10 ⁻⁵
Camper 5 - Toddler	1.01x10 ⁻⁴	1.43x10 ⁻³	4.09x10 ⁻⁶	5.26x10 ⁻⁶	3.81x10 ⁻⁶	5.71x10 ⁻⁴	1.58x10 ⁻⁴	7.04x10 ⁻⁶	1.73x10 ⁻⁵	6.56x10 ⁻⁷	2.10x10 ⁻⁴	0.00	8.39x10 ⁻⁴	3.34x10 ⁻³	7.23x10 ⁻⁵
Camper 5 - Child	6.77x10 ⁻⁵	1.16x10 ⁻³	2.92x10 ⁻⁶	3.75x10 ⁻⁶	2.72x10 ⁻⁶	4.07x10 ⁻⁴	1.13x10 ⁻⁴	5.03x10 ⁻⁶	1.23x10 ⁻⁵	4.68x10 ⁻⁷	1.20x10 ⁻⁴	0.00	1.05x10 ⁻⁴	2.00x10 ⁻³	5.49x10 ⁻⁵
Camper 5 - Adult	5.91x10 ⁻⁵	6.66x10 ⁻⁴	1.84x10 ⁻⁶	2.36x10 ⁻⁶	1.71x10 ⁻⁶	2.56x10 ⁻⁴	7.08x10 ⁻⁵	3.16x10 ⁻⁶	7.75x10 ⁻⁶	2.94x10 ⁻⁷	5.12x10 ⁻⁵	6.11x10 ⁻⁴	4.89x10 ⁻⁵	1.78x10 ⁻³	4.19x10 ⁻⁵

Nickel mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	4.78x10 ⁻⁶	1.65x10 ⁻⁵	2.44x10 ⁻⁷	2.08x10 ⁻⁷	3.09x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.38x10 ⁻⁷	5.75x10 ⁻⁶	3.97x10 ⁻⁷	4.82x10 ⁻⁶	0.00	6.94x10 ⁻⁶	6.10x10 ⁻⁵	2.09x10 ⁻⁶
Camper 1 - Child	3.19x10 ⁻⁶	1.34x10 ⁻⁵	1.74x10 ⁻⁷	1.48x10 ⁻⁷	2.20x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.12x10 ⁻⁷	4.11x10 ⁻⁶	2.83x10 ⁻⁷	2.74x10 ⁻⁶	0.00	8.70x10 ⁻⁷	4.02x10 ⁻⁵	1.59x10 ⁻⁶
Camper 1 - Adult	2.79x10 ⁻⁶	7.69x10 ⁻⁶	1.10x10 ⁻⁷	9.33x10 ⁻⁸	1.39x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	1.96x10 ⁻⁷	2.58x10 ⁻⁶	1.78x10 ⁻⁷	1.17x10 ⁻⁶	9.92x10 ⁻⁷	4.05x10 ⁻⁷	2.56x10 ⁻⁵	1.21x10 ⁻⁶
Camper 3 - Toddler	4.78x10 ⁻⁶	1.65x10 ⁻⁵	2.80x10 ⁻⁷	3.27x10 ⁻⁷	3.09x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.38x10 ⁻⁷	5.87x10 ⁻⁶	3.97x10 ⁻⁷	5.82x10 ⁻⁶	0.00	1.07x10 ⁻⁵	6.61x10 ⁻⁵	3.22x10 ⁻⁶
Camper 3 - Child	3.19x10 ⁻⁶	1.34x10 ⁻⁵	2.00x10 ⁻⁷	2.33x10 ⁻⁷	2.20x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.12x10 ⁻⁷	4.19x10 ⁻⁶	2.83x10 ⁻⁷	3.31x10 ⁻⁶	0.00	1.34x10 ⁻⁶	4.14x10 ⁻⁵	2.45x10 ⁻⁶
Camper 3 - Adult	2.79x10 ⁻⁶	7.69x10 ⁻⁶	1.25x10 ⁻⁷	1.47x10 ⁻⁷	1.39x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	1.96x10 ⁻⁷	2.64x10 ⁻⁶	1.78x10 ⁻⁷	1.41x10 ⁻⁶	9.92x10 ⁻⁷	6.24x10 ⁻⁷	2.62x10 ⁻⁵	1.87x10 ⁻⁶
Camper 4 - Toddler	1.70x10 ⁻⁵	5.88x10 ⁻⁵	2.44x10 ⁻⁷	2.08x10 ⁻⁷	4.37x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.38x10 ⁻⁷	5.75x10 ⁻⁶	1.42x10 ⁻⁶	4.82x10 ⁻⁶	0.00	8.11x10 ⁻⁶	1.18x10 ⁻⁴	2.45x10 ⁻⁶
Camper 4 - Child	1.14x10 ⁻⁵	4.78x10 ⁻⁵	1.74x10 ⁻⁷	1.48x10 ⁻⁷	3.12x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.12x10 ⁻⁷	4.11x10 ⁻⁶	1.01x10 ⁻⁶	2.74x10 ⁻⁶	0.00	1.02x10 ⁻⁶	8.37x10 ⁻⁵	1.86x10 ⁻⁶
Camper 4 - Adult	9.94x10 ⁻⁶	2.74x10 ⁻⁵	1.10x10 ⁻⁷	9.33x10 ⁻⁸	1.96x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	1.96x10 ⁻⁷	2.58x10 ⁻⁶	6.35x10 ⁻⁷	1.17x10 ⁻⁶	9.92x10 ⁻⁷	4.73x10 ⁻⁷	5.31x10 ⁻⁵	1.42x10 ⁻⁶
Camper 5 - Toddler	4.49x10 ⁻⁵	1.55x10 ⁻⁴	2.80x10 ⁻⁷	3.27x10 ⁻⁷	8.07x10 ⁻⁷	1.78x10 ⁻⁵	2.83x10 ⁻⁶	4.38x10 ⁻⁷	5.87x10 ⁻⁶	3.73x10 ⁻⁶	5.82x10 ⁻⁶	0.00	1.46x10 ⁻⁵	2.52x10 ⁻⁴	4.39x10 ⁻⁶
Camper 5 - Child	3.00x10 ⁻⁵	1.26x10 ⁻⁴	2.00x10 ⁻⁷	2.33x10 ⁻⁷	5.76x10 ⁻⁷	1.27x10 ⁻⁵	2.02x10 ⁻⁶	3.12x10 ⁻⁷	4.19x10 ⁻⁶	2.66x10 ⁻⁶	3.31x10 ⁻⁶	0.00	1.83x10 ⁻⁶	1.84x10 ⁻⁴	3.33x10 ⁻⁶
Camper 5 - Adult	2.62x10 ⁻⁵	7.24x10 ⁻⁵	1.25x10 ⁻⁷	1.47x10 ⁻⁷	3.62x10 ⁻⁷	8.00x10 ⁻⁶	1.27x10 ⁻⁶	1.96x10 ⁻⁷	2.64x10 ⁻⁶	1.67x10 ⁻⁶	1.41x10 ⁻⁶	9.92x10 ⁻⁷	8.50x10 ⁻⁷	1.16x10 ⁻⁴	2.55x10 ⁻⁶

TABLE 4.5-11 (Cont'd)
HUMAN INTAKES OF COPC FOR “TREAT ALL FLOWS” SCENARIO

Silver mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	1.31x10 ⁻⁸	3.25x10 ⁻⁷	6.11x10 ⁻⁹	6.17x10 ⁻⁹	2.81x10 ⁻⁹	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.85x10 ⁻⁹	1.58x10 ⁻⁷	1.51x10 ⁻⁹	9.93x10 ⁻⁸	0.00	6.06x10 ⁻⁷	2.55x10 ⁻⁴	1.31x10 ⁻⁷
Camper 1 - Child	8.75x10 ⁻⁹	2.64x10 ⁻⁷	4.36x10 ⁻⁹	4.40x10 ⁻⁹	2.01x10 ⁻⁹	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.46x10 ⁻⁹	1.12x10 ⁻⁷	1.08x10 ⁻⁹	5.66x10 ⁻⁸	0.00	7.60x10 ⁻⁸	1.82x10 ⁻⁴	9.91x10 ⁻⁸
Camper 1 - Adult	7.63x10 ⁻⁹	1.52x10 ⁻⁷	2.74x10 ⁻⁹	2.77x10 ⁻⁹	1.26x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.18x10 ⁻⁹	7.07x10 ⁻⁸	6.79x10 ⁻¹⁰	2.41x10 ⁻⁸	9.02x10 ⁻⁹	3.54x10 ⁻⁸	1.14x10 ⁻⁴	7.57x10 ⁻⁸
Camper 3 - Toddler	1.31x10 ⁻⁸	3.25x10 ⁻⁷	4.42x10 ⁻⁹	4.17x10 ⁻⁹	2.81x10 ⁻⁹	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.85x10 ⁻⁹	1.29x10 ⁻⁷	1.51x10 ⁻⁹	4.36x10 ⁻⁸	0.00	6.06x10 ⁻⁷	2.55x10 ⁻⁴	1.31x10 ⁻⁷
Camper 3 - Child	8.75x10 ⁻⁹	2.64x10 ⁻⁷	3.16x10 ⁻⁹	2.98x10 ⁻⁹	2.01x10 ⁻⁹	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.46x10 ⁻⁹	9.21x10 ⁻⁸	1.08x10 ⁻⁹	2.48x10 ⁻⁸	0.00	7.60x10 ⁻⁸	1.82x10 ⁻⁴	9.91x10 ⁻⁸
Camper 3 - Adult	7.63x10 ⁻⁹	1.52x10 ⁻⁷	1.99x10 ⁻⁹	1.87x10 ⁻⁹	1.26x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.18x10 ⁻⁹	5.79x10 ⁻⁸	6.79x10 ⁻¹⁰	1.06x10 ⁻⁸	9.02x10 ⁻⁹	3.54x10 ⁻⁸	1.14x10 ⁻⁴	7.57x10 ⁻⁸
Camper 4 - Toddler	4.55x10 ⁻⁷	1.13x10 ⁻⁵	6.11x10 ⁻⁹	6.17x10 ⁻⁹	9.91x10 ⁻⁹	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.85x10 ⁻⁹	1.58x10 ⁻⁷	5.26x10 ⁻⁸	9.93x10 ⁻⁸	0.00	1.43x10 ⁻⁶	2.68x10 ⁻⁴	3.09x10 ⁻⁷
Camper 4 - Child	3.04x10 ⁻⁷	9.19x10 ⁻⁶	4.36x10 ⁻⁹	4.40x10 ⁻⁹	7.08x10 ⁻⁹	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.46x10 ⁻⁹	1.12x10 ⁻⁷	3.75x10 ⁻⁸	5.66x10 ⁻⁸	0.00	1.80x10 ⁻⁷	1.91x10 ⁻⁴	2.34x10 ⁻⁷
Camper 4 - Adult	2.65x10 ⁻⁷	5.28x10 ⁻⁶	2.74x10 ⁻⁹	2.77x10 ⁻⁹	4.45x10 ⁻⁹	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.18x10 ⁻⁹	7.07x10 ⁻⁸	2.36x10 ⁻⁸	2.41x10 ⁻⁸	9.02x10 ⁻⁹	8.36x10 ⁻⁸	1.20x10 ⁻⁴	1.79x10 ⁻⁷
Camper 5 - Toddler	1.74x10 ⁻⁶	4.32x10 ⁻⁵	4.42x10 ⁻⁹	4.17x10 ⁻⁹	3.33x10 ⁻⁸	2.46x10 ⁻⁴	8.30x10 ⁻⁶	4.85x10 ⁻⁹	1.29x10 ⁻⁷	2.01x10 ⁻⁷	4.36x10 ⁻⁸	0.00	6.06x10 ⁻⁷	3.00x10 ⁻⁴	1.31x10 ⁻⁷
Camper 5 - Child	1.16x10 ⁻⁶	3.51x10 ⁻⁵	3.16x10 ⁻⁹	2.98x10 ⁻⁹	2.38x10 ⁻⁸	1.76x10 ⁻⁴	5.93x10 ⁻⁶	3.46x10 ⁻⁹	9.21x10 ⁻⁸	1.43x10 ⁻⁷	2.48x10 ⁻⁸	0.00	7.60x10 ⁻⁸	2.18x10 ⁻⁴	9.91x10 ⁻⁸
Camper 5 - Adult	1.01x10 ⁻⁶	2.02x10 ⁻⁵	1.99x10 ⁻⁹	1.87x10 ⁻⁹	1.50x10 ⁻⁸	1.10x10 ⁻⁴	3.73x10 ⁻⁶	2.18x10 ⁻⁹	5.79x10 ⁻⁸	9.02x10 ⁻⁸	1.06x10 ⁻⁸	9.02x10 ⁻⁹	3.54x10 ⁻⁸	1.36x10 ⁻⁴	7.57x10 ⁻⁸

Thallium mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	0.00	0.00	1.77x10 ⁻⁸	6.69x10 ⁻⁸	4.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.79x10 ⁻⁸	0.00	2.21x10 ⁻⁸	0.00	0.00	4.10x10 ⁻⁶	0.00
Camper 1 - Child	0.00	0.00	1.26x10 ⁻⁸	4.78x10 ⁻⁸	3.22x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.99x10 ⁻⁸	0.00	1.26x10 ⁻⁸	0.00	0.00	2.92x10 ⁻⁶	0.00
Camper 1 - Adult	0.00	0.00	7.94x10 ⁻⁹	3.00x10 ⁻⁸	2.03x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.39x10 ⁻⁸	0.00	5.36x10 ⁻⁹	1.62x10 ⁻⁷	0.00	2.00x10 ⁻⁶	0.00
Camper 3 - Toddler	0.00	0.00	4.55x10 ⁻⁹	6.89x10 ⁻⁹	4.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.64x10 ⁻⁸	0.00	4.06x10 ⁻⁸	0.00	0.00	4.04x10 ⁻⁶	0.00
Camper 3 - Child	0.00	0.00	3.25x10 ⁻⁹	4.92x10 ⁻⁹	3.22x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.88x10 ⁻⁸	0.00	2.31x10 ⁻⁸	0.00	0.00	2.88x10 ⁻⁶	0.00
Camper 3 - Adult	0.00	0.00	2.04x10 ⁻⁹	3.09x10 ⁻⁹	2.03x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.33x10 ⁻⁸	0.00	9.88x10 ⁻⁹	1.62x10 ⁻⁷	0.00	1.97x10 ⁻⁶	0.00
Camper 4 - Toddler	0.00	0.00	1.77x10 ⁻⁸	6.69x10 ⁻⁸	3.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.79x10 ⁻⁸	0.00	2.21x10 ⁻⁸	0.00	0.00	4.10x10 ⁻⁶	0.00
Camper 4 - Child	0.00	0.00	1.26x10 ⁻⁸	4.78x10 ⁻⁸	2.51x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.99x10 ⁻⁸	0.00	1.26x10 ⁻⁸	0.00	0.00	2.92x10 ⁻⁶	0.00
Camper 4 - Adult	0.00	0.00	7.94x10 ⁻⁹	3.00x10 ⁻⁸	1.58x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.39x10 ⁻⁸	0.00	5.36x10 ⁻⁹	1.62x10 ⁻⁷	0.00	2.00x10 ⁻⁶	0.00
Camper 5 - Toddler	0.00	0.00	4.55x10 ⁻⁹	6.89x10 ⁻⁹	4.51x10 ⁻⁹	3.57x10 ⁻⁶	2.83x10 ⁻⁷	4.13x10 ⁻⁸	9.64x10 ⁻⁸	0.00	4.06x10 ⁻⁸	0.00	0.00	4.04x10 ⁻⁶	0.00
Camper 5 - Child	0.00	0.00	3.25x10 ⁻⁹	4.92x10 ⁻⁹	3.22x10 ⁻⁹	2.55x10 ⁻⁶	2.02x10 ⁻⁷	2.95x10 ⁻⁸	6.88x10 ⁻⁸	0.00	2.31x10 ⁻⁸	0.00	0.00	2.88x10 ⁻⁶	0.00
Camper 5 - Adult	0.00	0.00	2.04x10 ⁻⁹	3.09x10 ⁻⁹	2.03x10 ⁻⁹	1.60x10 ⁻⁶	1.27x10 ⁻⁷	1.85x10 ⁻⁸	4.33x10 ⁻⁸	0.00	9.88x10 ⁻⁹	1.62x10 ⁻⁷	0.00	1.97x10 ⁻⁶	0.00

TABLE 4.5-11 (Cont'd)
HUMAN INTAKES OF COPC FOR “TREAT ALL FLOWS” SCENARIO

Tin mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	0.00	0.00	9.23x10 ⁻⁸	8.47x10 ⁻⁸	7.74x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	2.10x10 ⁻⁶	0.00	3.45x10 ⁻⁶	0.00	2.34x10 ⁻⁶	1.33x10 ⁻⁵	2.02x10 ⁻⁷
Camper 1 - Child	0.00	0.00	6.58x10 ⁻⁸	6.05x10 ⁻⁸	5.53x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	1.50x10 ⁻⁶	0.00	1.97x10 ⁻⁶	0.00	2.94x10 ⁻⁷	7.59x10 ⁻⁶	1.53x10 ⁻⁷
Camper 1 - Adult	0.00	0.00	4.14x10 ⁻⁸	3.80x10 ⁻⁸	3.48x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	9.42x10 ⁻⁷	0.00	8.39x10 ⁻⁷	1.80x10 ⁻⁷	1.37x10 ⁻⁷	4.51x10 ⁻⁶	1.17x10 ⁻⁷
Camper 3 - Toddler	0.00	0.00	2.18x10 ⁻⁷	1.58x10 ⁻⁷	7.74x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	4.69x10 ⁻⁶	0.00	2.03x10 ⁻⁷	0.00	3.04x10 ⁻⁶	1.35x10 ⁻⁵	2.62x10 ⁻⁷
Camper 3 - Child	0.00	0.00	1.55x10 ⁻⁷	1.13x10 ⁻⁷	5.53x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	3.35x10 ⁻⁶	0.00	1.16x10 ⁻⁷	0.00	3.81x10 ⁻⁷	7.82x10 ⁻⁶	1.99x10 ⁻⁷
Camper 3 - Adult	0.00	0.00	9.77x10 ⁻⁸	7.09x10 ⁻⁸	3.48x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	2.11x10 ⁻⁶	0.00	4.94x10 ⁻⁸	1.80x10 ⁻⁷	1.78x10 ⁻⁷	5.01x10 ⁻⁶	1.52x10 ⁻⁷
Camper 4 - Toddler	0.00	0.00	9.23x10 ⁻⁸	8.47x10 ⁻⁸	1.81x10 ⁻⁷	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	2.10x10 ⁻⁶	0.00	3.45x10 ⁻⁶	0.00	1.91x10 ⁻⁶	1.29x10 ⁻⁵	1.64x10 ⁻⁷
Camper 4 - Child	0.00	0.00	6.58x10 ⁻⁸	6.05x10 ⁻⁸	1.29x10 ⁻⁷	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	1.50x10 ⁻⁶	0.00	1.97x10 ⁻⁶	0.00	2.39x10 ⁻⁷	7.61x10 ⁻⁶	1.25x10 ⁻⁷
Camper 4 - Adult	0.00	0.00	4.14x10 ⁻⁸	3.80x10 ⁻⁸	8.12x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	9.42x10 ⁻⁷	0.00	8.39x10 ⁻⁷	1.80x10 ⁻⁷	1.11x10 ⁻⁷	4.53x10 ⁻⁶	9.52x10 ⁻⁸
Camper 5 - Toddler	0.00	0.00	2.18x10 ⁻⁷	1.58x10 ⁻⁷	7.74x10 ⁻⁸	3.57x10 ⁻⁶	1.13x10 ⁻⁶	4.18x10 ⁻⁷	4.69x10 ⁻⁶	0.00	2.03x10 ⁻⁷	0.00	4.73x10 ⁻⁶	1.52x10 ⁻⁵	4.08x10 ⁻⁷
Camper 5 - Child	0.00	0.00	1.55x10 ⁻⁷	1.13x10 ⁻⁷	5.53x10 ⁻⁸	2.55x10 ⁻⁶	8.09x10 ⁻⁷	2.99x10 ⁻⁷	3.35x10 ⁻⁶	0.00	1.16x10 ⁻⁷	0.00	5.93x10 ⁻⁷	8.03x10 ⁻⁶	3.10x10 ⁻⁷
Camper 5 - Adult	0.00	0.00	9.77x10 ⁻⁸	7.09x10 ⁻⁸	3.48x10 ⁻⁸	1.60x10 ⁻⁶	5.09x10 ⁻⁷	1.88x10 ⁻⁷	2.11x10 ⁻⁶	0.00	4.94x10 ⁻⁸	1.80x10 ⁻⁷	2.76x10 ⁻⁷	5.11x10 ⁻⁶	2.36x10 ⁻⁷

Zinc mg/(kg d)	Ingestion													Total Intake	
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	Ingestion	Dermal
Camper 1 - Toddler	4.03x10 ⁻⁵	3.11x10 ⁻³	5.66x10 ⁻⁴	3.50x10 ⁻⁴	3.91x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	5.42x10 ⁻³	2.01x10 ⁻³	9.54x10 ⁻⁵	5.63x10 ⁻⁵	0.00	4.45x10 ⁻⁴	2.09x10 ⁻¹	7.67x10 ⁻⁶
Camper 1 - Child	2.69x10 ⁻⁵	2.53x10 ⁻³	4.04x10 ⁻⁴	2.50x10 ⁻⁴	2.79x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	3.87x10 ⁻³	1.43x10 ⁻³	6.81x10 ⁻⁵	3.20x10 ⁻⁵	0.00	5.58x10 ⁻⁵	1.50x10 ⁻¹	5.83x10 ⁻⁶
Camper 1 - Adult	2.35x10 ⁻⁵	1.45x10 ⁻³	2.54x10 ⁻⁴	1.57x10 ⁻⁴	1.75x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.43x10 ⁻³	9.01x10 ⁻⁴	4.28x10 ⁻⁵	1.37x10 ⁻⁵	3.88x10 ⁻⁵	2.60x10 ⁻⁵	9.39x10 ⁻²	4.45x10 ⁻⁶
Camper 3 - Toddler	4.03x10 ⁻⁵	3.11x10 ⁻³	3.13x10 ⁻⁴	8.26x10 ⁻⁴	3.91x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	5.42x10 ⁻³	5.41x10 ⁻⁴	9.54x10 ⁻⁵	5.29x10 ⁻⁵	0.00	1.98x10 ⁻⁴	2.08x10 ⁻¹	3.42x10 ⁻⁶
Camper 3 - Child	2.69x10 ⁻⁵	2.53x10 ⁻³	2.24x10 ⁻⁴	5.90x10 ⁻⁴	2.79x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	3.87x10 ⁻³	3.86x10 ⁻⁴	6.81x10 ⁻⁵	3.01x10 ⁻⁵	0.00	2.49x10 ⁻⁵	1.49x10 ⁻¹	2.59x10 ⁻⁶
Camper 3 - Adult	2.35x10 ⁻⁵	1.45x10 ⁻³	1.41x10 ⁻⁴	3.71x10 ⁻⁴	1.75x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.43x10 ⁻³	2.43x10 ⁻⁴	4.28x10 ⁻⁵	1.29x10 ⁻⁵	3.88x10 ⁻⁵	1.16x10 ⁻⁵	9.33x10 ⁻²	1.98x10 ⁻⁶
Camper 4 - Toddler	1.31x10 ⁻⁴	1.01x10 ⁻²	5.66x10 ⁻⁴	3.50x10 ⁻⁴	5.94x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	5.42x10 ⁻³	2.01x10 ⁻³	3.11x10 ⁻⁴	5.63x10 ⁻⁵	0.00	7.48x10 ⁻⁴	2.17x10 ⁻¹	1.29x10 ⁻⁵
Camper 4 - Child	8.77x10 ⁻⁵	8.23x10 ⁻³	4.04x10 ⁻⁴	2.50x10 ⁻⁴	4.24x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	3.87x10 ⁻³	1.43x10 ⁻³	2.22x10 ⁻⁴	3.20x10 ⁻⁵	0.00	9.38x10 ⁻⁵	1.56x10 ⁻¹	9.79x10 ⁻⁶
Camper 4 - Adult	7.65x10 ⁻⁵	4.73x10 ⁻³	2.54x10 ⁻⁴	1.57x10 ⁻⁴	2.67x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.43x10 ⁻³	9.01x10 ⁻⁴	1.39x10 ⁻⁴	1.37x10 ⁻⁵	3.88x10 ⁻⁵	4.36x10 ⁻⁵	9.74x10 ⁻²	7.47x10 ⁻⁶
Camper 5 - Toddler	1.39x10 ⁻⁴	1.07x10 ⁻²	3.13x10 ⁻⁴	8.26x10 ⁻⁴	4.74x10 ⁻⁴	1.83x10 ⁻¹	1.37x10 ⁻²	5.42x10 ⁻³	5.41x10 ⁻⁴	3.29x10 ⁻⁴	5.29x10 ⁻⁵	0.00	2.73x10 ⁻⁴	2.16x10 ⁻¹	4.70x10 ⁻⁶
Camper 5 - Child	9.29x10 ⁻⁵	8.72x10 ⁻³	2.24x10 ⁻⁴	5.90x10 ⁻⁴	3.38x10 ⁻⁴	1.31x10 ⁻¹	9.74x10 ⁻³	3.87x10 ⁻³	3.86x10 ⁻⁴	2.35x10 ⁻⁴	3.01x10 ⁻⁵	0.00	3.42x10 ⁻⁵	1.55x10 ⁻¹	3.57x10 ⁻⁶
Camper 5 - Adult	8.11x10 ⁻⁵	5.01x10 ⁻³	1.41x10 ⁻⁴	3.71x10 ⁻⁴	2.13x10 ⁻⁴	8.23x10 ⁻²	6.13x10 ⁻³	2.43x10 ⁻³	2.43x10 ⁻⁴	1.48x10 ⁻⁴	1.29x10 ⁻⁵	3.88x10 ⁻⁵	1.59x10 ⁻⁵	9.71x10 ⁻²	2.72x10 ⁻⁶

TABLE 4.5-12
PERCENTAGE BREAKDOWN BY PATHWAY FOR
“TREAT ALL FLOWS” SCENARIO

Percent Intake by Pathway														
Arsenic	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	7.69%	34.30%	0.16%	0.15%	0.05%	10.11%	5.73%	0.05%	3.46%	1.45%	0.98%	n/a	34.90%	0.96%
Camper 1 - Child	9.57%	51.81%	0.21%	0.20%	0.06%	13.42%	7.61%	0.06%	4.60%	1.93%	1.04%	n/a	8.14%	1.36%
Camper 1 - Adult	13.62%	48.57%	0.22%	0.20%	0.06%	13.77%	7.81%	0.06%	4.72%	1.98%	0.72%	0.39%	6.18%	1.69%
Camper 3 - Toddler	9.81%	43.72%	0.10%	0.13%	0.06%	12.89%	7.31%	0.06%	1.80%	1.85%	2.47%	n/a	19.27%	0.53%
Camper 3 - Child	10.32%	55.87%	0.11%	0.14%	0.06%	14.47%	8.21%	0.07%	2.02%	2.08%	2.21%	n/a	3.80%	0.63%
Camper 3 - Adult	14.60%	52.08%	0.11%	0.14%	0.07%	14.77%	8.37%	0.07%	2.06%	2.12%	1.53%	0.42%	2.87%	0.79%
Camper 4 - Toddler	11.52%	51.36%	0.10%	0.09%	0.08%	6.26%	3.55%	0.03%	2.14%	2.18%	0.61%	n/a	21.49%	0.59%
Camper 4 - Child	12.19%	66.00%	0.11%	0.10%	0.09%	7.07%	4.01%	0.03%	2.42%	2.46%	0.55%	n/a	4.26%	0.71%
Camper 4 - Adult	17.24%	61.47%	0.11%	0.11%	0.09%	7.21%	4.09%	0.03%	2.47%	2.51%	0.38%	0.20%	3.22%	0.88%
Camper 5 - Toddler	15.32%	68.30%	0.02%	0.03%	0.04%	3.08%	1.75%	0.01%	0.43%	2.90%	0.59%	n/a	7.32%	0.20%
Camper 5 - Child	14.03%	75.97%	0.02%	0.03%	0.04%	3.01%	1.71%	0.01%	0.42%	2.83%	0.46%	n/a	1.26%	0.21%
Camper 5 - Adult	19.75%	70.44%	0.02%	0.03%	0.04%	3.06%	1.73%	0.01%	0.43%	2.87%	0.32%	0.09%	0.94%	0.26%

Cadmium	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	2.50%	38.65%	0.02%	0.00%	0.20%	51.10%	1.66%	0.00%	1.71%	2.21%	0.63%	n/a	1.27%	0.04%
Camper 1 - Child	2.25%	42.30%	0.02%	0.00%	0.20%	49.13%	1.60%	0.00%	1.64%	2.13%	0.49%	n/a	0.21%	0.04%
Camper 1 - Adult	3.22%	39.80%	0.02%	0.00%	0.20%	50.60%	1.65%	0.00%	1.69%	2.19%	0.34%	0.07%	0.16%	0.04%
Camper 3 - Toddler	2.52%	38.93%	0.02%	0.00%	0.21%	51.47%	1.68%	0.00%	1.48%	2.23%	0.25%	n/a	1.20%	0.03%
Camper 3 - Child	2.26%	42.53%	0.02%	0.00%	0.20%	49.40%	1.61%	0.00%	1.42%	2.14%	0.19%	n/a	0.20%	0.03%
Camper 3 - Adult	3.23%	39.99%	0.02%	0.00%	0.20%	50.84%	1.66%	0.00%	1.46%	2.20%	0.13%	0.07%	0.15%	0.04%
Camper 4 - Toddler	3.03%	46.84%	0.02%	0.00%	0.19%	42.41%	1.38%	0.00%	1.42%	2.68%	0.53%	n/a	1.46%	0.04%
Camper 4 - Child	2.70%	50.79%	0.02%	0.00%	0.19%	40.39%	1.32%	0.00%	1.35%	2.55%	0.40%	n/a	0.24%	0.04%
Camper 4 - Adult	3.89%	48.07%	0.02%	0.00%	0.19%	41.85%	1.36%	0.00%	1.40%	2.65%	0.28%	0.05%	0.19%	0.05%
Camper 5 - Toddler	4.06%	62.82%	0.01%	0.00%	0.27%	26.99%	0.88%	0.00%	0.78%	3.60%	0.13%	n/a	0.46%	0.01%
Camper 5 - Child	3.52%	66.19%	0.01%	0.00%	0.25%	24.98%	0.81%	0.00%	0.72%	3.33%	0.10%	n/a	0.07%	0.01%
Camper 5 - Adult	5.11%	63.24%	0.01%	0.00%	0.26%	26.13%	0.85%	0.00%	0.75%	3.48%	0.07%	0.03%	0.06%	0.02%

Copper	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.49%	24.19%	0.03%	0.03%	0.05%	63.73%	10.12%	0.04%	0.05%	0.04%	0.40%	n/a	0.76%	0.07%
Camper 1 - Child	0.45%	26.84%	0.02%	0.03%	0.05%	62.11%	9.86%	0.03%	0.05%	0.04%	0.31%	n/a	0.13%	0.07%
Camper 1 - Adult	0.64%	25.02%	0.03%	0.03%	0.05%	63.37%	10.06%	0.04%	0.05%	0.04%	0.22%	0.28%	0.10%	0.08%
Camper 3 - Toddler	0.50%	24.32%	0.02%	0.02%	0.05%	64.06%	10.17%	0.04%	0.04%	0.04%	0.38%	n/a	0.35%	0.03%
Camper 3 - Child	0.45%	26.88%	0.02%	0.02%	0.05%	62.21%	9.88%	0.03%	0.04%	0.04%	0.29%	n/a	0.06%	0.03%
Camper 3 - Adult	0.64%	25.06%	0.02%	0.02%	0.05%	63.46%	10.08%	0.04%	0.04%	0.04%	0.20%	0.28%	0.04%	0.04%
Camper 4 - Toddler	0.46%	22.48%	0.03%	0.03%	0.04%	64.70%	10.27%	0.04%	0.05%	0.04%	0.41%	n/a	1.34%	0.12%
Camper 4 - Child	0.42%	25.12%	0.03%	0.03%	0.04%	63.49%	10.08%	0.04%	0.05%	0.04%	0.32%	n/a	0.23%	0.12%
Camper 4 - Adult	0.60%	23.38%	0.03%	0.03%	0.04%	64.69%	10.27%	0.04%	0.05%	0.04%	0.22%	0.29%	0.17%	0.15%
Camper 5 - Toddler	0.96%	47.18%	0.01%	0.01%	0.07%	44.03%	6.99%	0.02%	0.03%	0.08%	0.26%	n/a	0.32%	0.03%
Camper 5 - Child	0.85%	50.59%	0.01%	0.01%	0.07%	41.48%	6.59%	0.02%	0.02%	0.07%	0.19%	n/a	0.05%	0.03%
Camper 5 - Adult	1.23%	48.11%	0.01%	0.01%	0.07%	43.18%	6.86%	0.02%	0.03%	0.08%	0.14%	0.19%	0.04%	0.03%

Lead	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	1.68%	8.21%	17.11%	19.57%	0.09%	3.11%	0.44%	0.00%	0.85%	0.02%	0.30%	n/a	48.38%	0.25%
Camper 1 - Child	2.57%	15.29%	28.01%	32.02%	0.15%	5.08%	0.72%	0.00%	1.40%	0.02%	0.39%	n/a	13.91%	0.44%
Camper 1 - Adult	3.69%	14.43%	28.94%	33.09%	0.16%	5.25%	0.74%	0.00%	1.45%	0.03%	0.28%	0.77%	10.64%	0.55%
Camper 3 - Toddler	6.44%	31.49%	7.95%	9.53%	0.35%	11.92%	1.69%	0.00%	0.39%	0.06%	0.39%	n/a	29.62%	0.15%
Camper 3 - Child	7.59%	45.12%	10.01%	12.00%	0.44%	15.00%	2.13%	0.01%	0.49%	0.07%	0.39%	n/a	6.55%	0.20%
Camper 3 - Adult	10.60%	41.44%	10.06%	12.06%	0.45%	15.08%	2.14%	0.01%	0.49%	0.07%	0.27%	2.21%	4.87%	0.25%
Camper 4 - Toddler	1.07%	5.23%	10.80%	12.35%	0.14%	1.96%	0.28%	0.00%	0.54%	0.01%	0.19%	n/a	67.08%	0.35%
Camper 4 - Child	2.21%	13.13%	23.82%	27.23%	0.32%	4.32%	0.61%	0.00%	1.19%	0.02%	0.33%	n/a	25.99%	0.81%
Camper 4 - Adult	3.28%	12.81%	25.43%	29.08%	0.34%	4.62%	0.65%	0.00%	1.27%	0.02%	0.24%	0.68%	20.53%	1.05%
Camper 5 - Toddler	8.48%	41.46%	4.79%	5.74%	0.41%	7.18%	1.02%	0.00%	0.23%	0.08%	0.23%	n/a	30.21%	0.16%
Camper 5 - Child	9.90%	58.80%	5.97%	7.15%	0.51%	8.95%	1.27%	0.00%	0.29%	0.10%	0.23%	n/a	6.61%	0.21%
Camper 5 - Adult	13.97%	54.64%	6.07%	7.28%	0.52%	9.10%	1.29%	0.00%	0.30%	0.10%	0.16%	1.33%	4.98%	0.26%

TABLE 4.5-12 (Cont'd)
PERCENTAGE BREAKDOWN BY PATHWAY FOR
“TREAT ALL FLOWS” SCENARIO

Manganese	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	2.43%	34.25%	0.06%	0.14%	0.14%	21.24%	5.87%	0.26%	0.18%	0.02%	22.31%	n/a	12.06%	1.04%
Camper 1 - Child	2.52%	43.22%	0.07%	0.16%	0.15%	23.55%	6.51%	0.29%	0.20%	0.02%	19.73%	n/a	2.35%	1.23%
Camper 1 - Adult	2.39%	26.90%	0.05%	0.11%	0.11%	16.04%	4.44%	0.20%	0.13%	0.01%	9.13%	38.30%	1.18%	1.01%
Camper 3 - Toddler	2.32%	32.71%	0.15%	0.19%	0.13%	20.29%	5.61%	0.25%	0.61%	0.02%	7.48%	n/a	27.84%	2.40%
Camper 3 - Child	2.72%	46.51%	0.18%	0.23%	0.17%	25.34%	7.01%	0.31%	0.77%	0.02%	7.46%	n/a	6.11%	3.19%
Camper 3 - Adult	2.44%	27.55%	0.12%	0.15%	0.11%	16.43%	4.54%	0.20%	0.50%	0.01%	3.28%	39.22%	2.93%	2.51%
Camper 4 - Toddler	3.68%	51.85%	0.04%	0.11%	0.43%	15.83%	4.38%	0.20%	0.13%	0.02%	16.63%	n/a	6.17%	0.53%
Camper 4 - Child	3.50%	59.91%	0.05%	0.11%	0.44%	16.06%	4.44%	0.20%	0.13%	0.02%	13.46%	n/a	1.10%	0.57%
Camper 4 - Adult	3.73%	42.09%	0.04%	0.08%	0.34%	12.35%	3.42%	0.15%	0.10%	0.02%	7.03%	29.49%	0.63%	0.54%
Camper 5 - Toddler	2.96%	41.78%	0.12%	0.15%	0.11%	16.70%	4.62%	0.21%	0.51%	0.02%	6.16%	n/a	24.55%	2.12%
Camper 5 - Child	3.30%	56.45%	0.14%	0.18%	0.13%	19.82%	5.48%	0.24%	0.60%	0.02%	5.83%	n/a	5.12%	2.67%
Camper 5 - Adult	3.24%	36.55%	0.10%	0.13%	0.09%	14.05%	3.89%	0.17%	0.43%	0.02%	2.81%	33.54%	2.68%	2.30%

Nickel	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	7.57%	26.12%	0.39%	0.33%	0.49%	28.25%	4.49%	0.69%	9.12%	0.63%	7.64%	n/a	10.99%	3.31%
Camper 1 - Child	7.64%	32.05%	0.42%	0.36%	0.53%	30.46%	4.84%	0.75%	9.83%	0.68%	6.57%	n/a	2.08%	3.80%
Camper 1 - Adult	10.39%	28.67%	0.41%	0.35%	0.52%	29.82%	4.74%	0.73%	9.62%	0.66%	4.37%	3.70%	1.51%	4.52%
Camper 3 - Toddler	6.89%	23.79%	0.40%	0.47%	0.45%	25.73%	4.09%	0.63%	8.48%	0.57%	8.40%	n/a	15.43%	4.65%
Camper 3 - Child	7.28%	30.52%	0.45%	0.53%	0.50%	29.00%	4.61%	0.71%	9.55%	0.65%	7.55%	n/a	3.06%	5.58%
Camper 3 - Adult	9.93%	27.41%	0.45%	0.52%	0.49%	28.50%	4.53%	0.70%	9.39%	0.63%	5.04%	3.53%	2.22%	6.66%
Camper 4 - Toddler	14.15%	48.85%	0.20%	0.17%	0.36%	14.81%	2.35%	0.36%	4.78%	1.18%	4.00%	n/a	6.74%	2.03%
Camper 4 - Child	13.31%	55.81%	0.20%	0.17%	0.36%	14.87%	2.36%	0.36%	4.80%	1.18%	3.21%	n/a	1.19%	2.17%
Camper 4 - Adult	18.23%	50.33%	0.20%	0.17%	0.36%	14.67%	2.33%	0.36%	4.74%	1.16%	2.15%	1.82%	0.87%	2.60%
Camper 5 - Toddler	17.49%	60.36%	0.11%	0.13%	0.31%	6.94%	1.10%	0.17%	2.29%	1.45%	2.27%	n/a	5.67%	1.71%
Camper 5 - Child	16.03%	67.22%	0.11%	0.12%	0.31%	6.79%	1.08%	0.17%	2.24%	1.42%	1.77%	n/a	0.97%	1.78%
Camper 5 - Adult	22.06%	60.92%	0.11%	0.12%	0.30%	6.74%	1.07%	0.17%	2.22%	1.41%	1.19%	0.83%	0.72%	2.14%

Silver	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.01%	0.13%	0.00%	0.00%	0.00%	96.22%	3.25%	0.00%	0.06%	0.00%	0.04%	n/a	0.24%	0.05%
Camper 1 - Child	0.00%	0.15%	0.00%	0.00%	0.00%	96.40%	3.25%	0.00%	0.06%	0.00%	0.03%	n/a	0.04%	0.05%
Camper 1 - Adult	0.01%	0.13%	0.00%	0.00%	0.00%	96.41%	3.26%	0.00%	0.06%	0.00%	0.02%	0.01%	0.03%	0.07%
Camper 3 - Toddler	0.01%	0.13%	0.00%	0.00%	0.00%	96.25%	3.25%	0.00%	0.05%	0.00%	0.02%	n/a	0.24%	0.05%
Camper 3 - Child	0.00%	0.15%	0.00%	0.00%	0.00%	96.43%	3.26%	0.00%	0.05%	0.00%	0.01%	n/a	0.04%	0.05%
Camper 3 - Adult	0.01%	0.13%	0.00%	0.00%	0.00%	96.43%	3.26%	0.00%	0.05%	0.00%	0.01%	0.01%	0.03%	0.07%
Camper 4 - Toddler	0.17%	4.22%	0.00%	0.00%	0.00%	91.74%	3.10%	0.00%	0.06%	0.02%	0.04%	n/a	0.53%	0.12%
Camper 4 - Child	0.16%	4.80%	0.00%	0.00%	0.00%	91.62%	3.09%	0.00%	0.06%	0.02%	0.03%	n/a	0.09%	0.12%
Camper 4 - Adult	0.22%	4.40%	0.00%	0.00%	0.00%	91.94%	3.10%	0.00%	0.06%	0.02%	0.02%	0.01%	0.07%	0.15%
Camper 5 - Toddler	0.58%	14.40%	0.00%	0.00%	0.01%	81.88%	2.76%	0.00%	0.04%	0.07%	0.01%	n/a	0.20%	0.04%
Camper 5 - Child	0.53%	16.10%	0.00%	0.00%	0.01%	80.44%	2.72%	0.00%	0.04%	0.07%	0.01%	n/a	0.03%	0.05%
Camper 5 - Adult	0.75%	14.89%	0.00%	0.00%	0.01%	81.40%	2.75%	0.00%	0.04%	0.07%	0.01%	0.01%	0.03%	0.06%

Thallium	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	n/a	n/a	0.43%	1.63%	0.11%	86.98%	6.91%	1.01%	2.39%	n/a	0.54%	n/a	n/a	n/a
Camper 1 - Child	n/a	n/a	0.43%	1.63%	0.11%	87.08%	6.92%	1.01%	2.39%	n/a	0.43%	n/a	n/a	n/a
Camper 1 - Adult	n/a	n/a	0.40%	1.50%	0.10%	80.11%	6.36%	0.93%	2.20%	n/a	0.27%	8.12%	n/a	n/a
Camper 3 - Toddler	n/a	n/a	0.11%	0.17%	0.11%	88.19%	7.01%	1.02%	2.38%	n/a	1.00%	n/a	n/a	n/a
Camper 3 - Child	n/a	n/a	0.11%	0.17%	0.11%	88.37%	7.02%	1.02%	2.39%	n/a	0.80%	n/a	n/a	n/a
Camper 3 - Adult	n/a	n/a	0.10%	0.16%	0.10%	81.29%	6.46%	0.94%	2.20%	n/a	0.50%	8.24%	n/a	n/a
Camper 4 - Toddler	n/a	n/a	0.43%	1.63%	0.09%	87.00%	6.91%	1.01%	2.39%	n/a	0.54%	n/a	n/a	n/a
Camper 4 - Child	n/a	n/a	0.43%	1.63%	0.09%	87.10%	6.92%	1.01%	2.39%	n/a	0.43%	n/a	n/a	n/a
Camper 4 - Adult	n/a	n/a	0.40%	1.50%	0.08%	80.13%	6.37%	0.93%	2.20%	n/a	0.27%	8.13%	n/a	n/a
Camper 5 - Toddler	n/a	n/a	0.11%	0.17%	0.11%	88.19%	7.01%	1.02%	2.38%	n/a	1.00%	n/a	n/a	n/a
Camper 5 - Child	n/a	n/a	0.11%	0.17%	0.11%	88.37%	7.02%	1.02%	2.39%	n/a	0.80%	n/a	n/a	n/a
Camper 5 - Adult	n/a	n/a	0.10%	0.16%	0.10%	81.29%	6.46%	0.94%	2.20%	n/a	0.50%	8.24%	n/a	n/a

TABLE 4.5-12 (Cont'd)
PERCENTAGE BREAKDOWN BY PATHWAY FOR
“TREAT ALL FLOWS” SCENARIO

Tin	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	n/a	n/a	0.69%	0.63%	0.58%	26.48%	8.41%	3.11%	15.59%	n/a	25.63%	n/a	17.39%	1.50%
Camper 1 - Child	n/a	n/a	0.85%	0.78%	0.71%	32.86%	10.44%	3.86%	19.34%	n/a	25.38%	n/a	3.79%	1.98%
Camper 1 - Adult	n/a	n/a	0.89%	0.82%	0.75%	34.59%	10.99%	4.06%	20.36%	n/a	18.14%	3.90%	2.95%	2.53%
Camper 3 - Toddler	n/a	n/a	1.58%	1.15%	0.56%	25.90%	8.23%	3.04%	34.07%	n/a	1.47%	n/a	22.10%	1.90%
Camper 3 - Child	n/a	n/a	1.94%	1.41%	0.69%	31.73%	10.08%	3.72%	41.75%	n/a	1.44%	n/a	4.76%	2.48%
Camper 3 - Adult	n/a	n/a	1.89%	1.37%	0.67%	30.98%	9.85%	3.64%	40.77%	n/a	0.96%	3.49%	3.44%	2.94%
Camper 4 - Toddler	n/a	n/a	0.70%	0.65%	1.38%	27.23%	8.65%	3.20%	16.03%	n/a	26.36%	n/a	14.55%	1.25%
Camper 4 - Child	n/a	n/a	0.85%	0.78%	1.67%	32.90%	10.46%	3.86%	19.37%	n/a	25.41%	n/a	3.09%	1.61%
Camper 4 - Adult	n/a	n/a	0.90%	0.82%	1.76%	34.60%	11.00%	4.06%	20.37%	n/a	18.14%	3.90%	2.40%	2.06%
Camper 5 - Toddler	n/a	n/a	1.39%	1.01%	0.50%	22.85%	7.26%	2.68%	30.07%	n/a	1.30%	n/a	30.32%	2.61%
Camper 5 - Child	n/a	n/a	1.86%	1.35%	0.66%	30.51%	9.69%	3.58%	40.14%	n/a	1.39%	n/a	7.11%	3.71%
Camper 5 - Adult	n/a	n/a	1.83%	1.33%	0.65%	29.93%	9.51%	3.51%	39.38%	n/a	0.92%	3.37%	5.16%	4.42%

Zinc	Ingestion													Dermal
	Water	Fish	Hare	Hoary Marmot	Beaver	Moose	Caribou	Sheep	Grouse	Mallard	Berries	Lab Tea	Soil	
Camper 1 - Toddler	0.02%	1.49%	0.27%	0.17%	0.19%	87.52%	6.52%	2.59%	0.96%	0.05%	0.03%	n/a	0.21%	0.004%
Camper 1 - Child	0.02%	1.69%	0.27%	0.17%	0.19%	87.49%	6.52%	2.59%	0.96%	0.05%	0.02%	n/a	0.04%	0.004%
Camper 1 - Adult	0.03%	1.55%	0.27%	0.17%	0.19%	87.59%	6.53%	2.59%	0.96%	0.05%	0.01%	0.04%	0.03%	0.005%
Camper 2 - Toddler	0.02%	1.42%	0.10%	0.05%	0.14%	88.60%	6.60%	2.62%	0.36%	0.04%	0.01%	n/a	0.05%	0.001%
Camper 2 - Child	0.02%	1.61%	0.10%	0.05%	0.14%	88.46%	6.59%	2.62%	0.36%	0.04%	0.01%	n/a	0.01%	0.001%
Camper 2 - Adult	0.02%	1.48%	0.10%	0.05%	0.14%	88.55%	6.60%	2.62%	0.36%	0.04%	0.01%	0.04%	0.01%	0.001%
Camper 3 - Toddler	0.02%	1.50%	0.15%	0.40%	0.19%	88.15%	6.57%	2.61%	0.26%	0.05%	0.03%	n/a	0.10%	0.002%
Camper 3 - Child	0.02%	1.70%	0.15%	0.40%	0.19%	88.04%	6.56%	2.60%	0.26%	0.05%	0.02%	n/a	0.02%	0.002%
Camper 3 - Adult	0.03%	1.56%	0.15%	0.40%	0.19%	88.13%	6.57%	2.61%	0.26%	0.05%	0.01%	0.04%	0.01%	0.002%
Camper 4 - Toddler	0.06%	4.66%	0.26%	0.16%	0.27%	84.36%	6.28%	2.50%	0.92%	0.14%	0.03%	n/a	0.34%	0.006%
Camper 4 - Child	0.06%	5.29%	0.26%	0.16%	0.27%	84.06%	6.26%	2.49%	0.92%	0.14%	0.02%	n/a	0.06%	0.006%
Camper 4 - Adult	0.08%	4.85%	0.26%	0.16%	0.27%	84.41%	6.29%	2.50%	0.92%	0.14%	0.01%	0.04%	0.04%	0.008%
Camper 5 - Toddler	0.06%	4.97%	0.14%	0.38%	0.22%	84.83%	6.32%	2.51%	0.25%	0.15%	0.02%	n/a	0.13%	0.002%
Camper 5 - Child	0.06%	5.63%	0.14%	0.38%	0.22%	84.35%	6.28%	2.50%	0.25%	0.15%	0.02%	n/a	0.02%	0.002%
Camper 5 - Adult	0.08%	5.16%	0.14%	0.38%	0.22%	84.72%	6.31%	2.51%	0.25%	0.15%	0.01%	0.04%	0.02%	0.003%

5.0 HAZARD ASSESSMENT

The hazard assessment phase of an ecological and/or human health risk assessment involves identification of contaminant concentrations or doses which have been shown to have adverse effects on the receptors (ecological species or humans) of concern. The exposure concentrations or doses are generally determined from controlled laboratory tests or from epidemiology studies and are used to establish toxicity benchmarks which are protective of the receptors.

5.1 AQUATIC TOXICITY EVALUATIONS

Within the Ecological Risk Assessment (ERA), valued ecosystem components (VECs) assessment endpoints represent potential effects at population or community levels. At these levels of biological organization, VEC population and community characteristics can be defined over fairly extended temporal and spatial scales making the potential for the direct measurement of effects challenging (Environment Canada, 1997). This is particularly relevant to the predictive nature of this assessment.

Due to the difficulty in measuring direct effects on assessment endpoints, “*measurement endpoints*” are adopted to provide a framework for the evaluation of predicted effects. A measurement endpoint is defined as “...a quantitative summary of the results of a toxicity test, a biological study, or other activity intended to reveal the effects of a substance” (Suter 1993). In lieu of direct assessment endpoint effects measures, the adoption of measurement endpoints provides a consistent basis for the evaluation of potential effects due to exposure of assessment endpoints.

Measurement endpoints are commonly selected at the individual level of biological organization, and are typically based on exposure responses that represent key population and community characteristics such as reproduction and abundance (Environment Canada 1997). Such measurement endpoints are commonly based on literature-derived toxicity dose-response relationships, examined through laboratory experimentation (*i.e.*, the response of a particular organism to a certain level of exposure). When derived from toxicity studies, such measurement endpoints are often referred to as toxicity benchmarks or toxicity reference values.

These toxicity reference values are used in risk assessments to judge whether the predicted (estimated) exposures (or doses or intakes) may potentially have an adverse effect on ecological species. Site-specific information was incorporated into the selection process where available. A discussion of selected literature and the associated toxicity reference values consulted in this assessment is provided in the following sections.

In this assessment, EC₂₅ (effects concentration) values which have the potential to affect 25% of the population were used to determine whether COPC are likely to cause adverse effects in aquatic receptors in Rose Creek, Vangorda Creek and Pelly River. The EC₂₅ value is suggested by Environment Canada for use in Tier 2 assessments (Environment Canada 1997). An EC₂₅ concentration was chosen as a TRV because effects or changes in populations in this range are generally not distinguishable from natural variation. In addition, a 25% reduction in rapidly growing populations (e.g. phytoplankton or zooplankton) might be quickly offset by reproduction once the chemical stress is removed or may be offset by growth and immigration from non-affected nearby locations. However, it is recognized that Environment Canada is in the process of reviewing the appropriate aquatic toxicity benchmarks; therefore, this assessment examined the effect of using a lower benchmark of EC₁₀ in a sensitivity analysis.

Where possible, effects concentration (EC) data were collected over lethal concentration (LC; mortality) data. Different models exist for translating chemical exposure (or dose) to toxic responses. For EC₅₀ toxicity values, in the absence of detailed dose-response functions, a linear approximation is commonly applied assuming zero effect at zero exposure. This linearization is pessimistic since the predicted effect will be greater than that observed using the commonly encountered sigmoidal dose-response function for low dose exposures. For acute toxicity values (LC₅₀ values derived from 96 hour tests) a factor of 10 was applied in the derivation of appropriate toxicity benchmarks (EC₂₅ values) for this assessment (Environment Canada/Health Canada 2003). For LC₅₀ data derived from chronic tests a factor of 4 was applied to determine the EC₂₅ benchmark. This is an empirical factor based on the results of other toxicity tests.

It was not the intent in this assessment to extensively search the primary literature to obtain TRVs; rather, this assessment relied on TRVs that have been collated and peer reviewed by various agencies for use in risk assessments. The U.S. DOE database (Suter *et al.* 1996) on aquatic TRVs was the primary source of toxicity information. This database contains TRVs for the protection of aquatic life from contaminants in water. EC₂₀ values provided in this database were selected as appropriate TRVs. The advantage in using these TRVs is that they were developed for use in risk assessments and have been peer reviewed. This database provides documentation on the sources and derivations of the values and discusses the relative conservatism in the TRVs. The selection of the species was based species that are present at the site, but also encompassed species found in the general area.

If data were not available from the DOE database then the U.S. EPA database AQUIRE (2003) was examined for infilling purposes. The data summarized in this database are from a variety of sources, including peer reviewed literature. Toxicity information provided in the CCME Water Quality Guidelines (1999) was also used in the development of TRVs for this assessment. It is acknowledged that these databases may not have the most recent data; however, the TRVs selected are, in our opinion, appropriate.

Decision rules for the selection of test species were developed around the available data. For aquatic plants, the lowest of the toxicity values for *Lemna* sp. or *Myriophyllum* sp. test species was chosen. These two species are considered to be the most sensitive aquatic plant species for which toxicity data are available. For benthic invertebrates, the lowest available toxicity values for any invertebrate test species were used. For the fish species, data were chosen for the species based on feeding habits (i.e., predatory or forage). The lowest toxicity value of these species was chosen to represent the respective predatory or forage fish.

In summary, TRVs provided in Table 5.1-1 were obtained from the U.S. DOE (Suter *et al.* 1996) and U.S. EPA AQUIRE (2003) databases, as well as the CCME (1999). This table outlines the references from which the TRVs were obtained, the test species and the rationale for selecting the appropriate values. It should be noted that the aquatic TRVs presented for benthic invertebrates are all based on water exposure only; sediment exposure is discussed and assessed separately using toxicity data based on sediment toxicity studies. Toxicity data for zinc exposure in phytoplankton, benthic invertebrates and forage fish were obtained from site-specific toxicity tests.

TABLE 5.1-1
SUMMARY OF TOXICITY REFERENCE VALUES FOR AQUATIC SPECIES

Aquatic Receptor	Arsenic (mg/L)				
	Test Species	LC/EC ₅₀	Toxicity Reference Value	Reference	Comments
Aquatic Plants	Myriophyllum sp.	0.63	0.32	Jenner & Janssen-Mommen (1993)	14-d EC ₅₀ (pop); derived an EC ₂₅ by linear extrapolation
Phytoplankton	Scenedesmus sp.	0.05	0.025	Vocke <i>et al.</i> (1980)	from CCME (1999); 14-d EC ₅₀ (growth); derived EC ₂₅ by linear extrapolation
Benthic Invertebrates	Calanus sp.	--	0.34	Borgmann <i>et al.</i> (1980)	from CCME (1999); 14-d EC ₂₀ ; used as toxicity reference value
Zooplankton	Daphnia sp.	--	0.79	Call <i>et al.</i> (1983), Lima <i>et al.</i> (1984)	from Suter and Tsao (1996); lowest chronic test EC ₂₀ – life-cycle tests; used as toxicity benchmark
Predator Fish	Rainbow Trout	0.55	0.14	Birge <i>et al.</i> (1979a)	from CCME (1999); 28-d LC ₅₀ ; derived benchmark using a factor of 4 based on an empirical relationship between chronic LC ₅₀ and EC ₂₀ .
Forage Fish	Goldfish	0.49	0.12	Birge <i>et al.</i> (1979b)	from U.S. EPA AQUIRE (2003); Lowest value for fathead minnow and goldfish based on 7-d LC ₅₀ (mortality); derived benchmark using a factor of 4 based on an empirical relationship between a chronic LC ₅₀ and an EC ₂₀ .

Aquatic Receptor	Cadmium (mg/L)				
	Test Species	LC/EC ₅₀	Toxicity Reference Value	Reference	Comments
Aquatic Plants	<i>Myriophyllum</i>	7.4	3.0	Stanley (1974)	from U.S. EPA AQUIRE; EC ₅₀ (population) 32-d; used an EC ₂₀ from linear extrapolation
Phytoplankton	<i>Scenedesmus</i>	0.008	0.003	Fargasova (1994)	from U.S. EPA AQUIRE; EC ₅₀ (population) 12-d; used an EC ₂₀ from linear extrapolation
Benthic Invertebrates	<i>Chironomus sp.</i>	1.2	0.12	Rehboldt <i>et al.</i> (1973)	from U.S. EPA AQUIRE; LC ₅₀ (mortality) 96-hr; derived TRV using a factor of 10 based on an empirical relationship between an acute LC ₅₀ and EC ₅₀
Zooplankton	<i>Daphnia sp.</i>	--	7.5x10 ⁻⁴	Elnabarawy <i>et al.</i> (1986)	from Suter and Tsao (1996); lowest chronic test EC ₂₀ – life-cycle tests
Predator Fish	Rainbow Trout	--	0.002	Carlson <i>et al.</i> (1982)	from Suter and Tsao (1996); lowest chronic test EC ₂₀ – early life stage tests
Forage Fish	Fathead Minnow	0.09	0.009	Hall <i>et al.</i> (1986)	from IPCS; 96-hr LC ₅₀ ; derived TRV using a factor of 10 based on an empirical relationship between an acute LC ₅₀ and EC ₅₀

TABLE 5.1-1 (Cont'd)
SUMMARY OF TOXICITY REFERENCE VALUES FOR AQUATIC SPECIES

Aquatic Receptor	Copper (mg/L)				
	Test Species	LC/EC ₅₀	Toxicity Reference Value	Reference	Comments
Aquatic Plants	<i>Myriophyllum</i> sp.	0.30	0.15	Stanley (1974)	from U.S. EPA AQUIRE (2003); 32-d EC ₅₀ (population); derived EC ₂₅ by linear extrapolation
Phytoplankton	<i>Scenedesmus</i> sp.	--	0.004	Franklin <i>et al.</i> (2000)	EC ₂₀ for cell growth, cell division and cell size for <i>Chlorella</i> and <i>Selenastrum</i>
Benthic Invertebrates	<i>Calanus</i> sp.	0.8	0.08	Hooftman <i>et al.</i> (1989)	from U.S. EPA AQUIRE (2003); LC ₅₀ (mortality) 72-hr; derived benchmark using factor of 10 from empirical relationship between an acute LC ₅₀ and an EC ₂₀ .
Zooplankton	<i>Daphnia</i> sp.	0.02	0.0041	Mastin and Rodgers (2000)	LC ₅₀ (mortality) 48hr; derived benchmark using a factor of 10 based on an empirical relationship between an acute LC ₅₀ and an EC ₂₀ . Used CCME benchmark since EC ₂₀ was less than CCME benchmark.
Predator Fish	Rainbow Trout	0.009	0.004	Marr <i>et al.</i> (1989)	LC ₅₀ (mortality) 96hr; used LC ₂₀ since factor of 0.1 gives a value << CCME benchmark.
Forage Fish	Goldfish	0.02	0.0041	Mastin and Rodgers (2000)	LC ₅₀ (mortality) 48hr; derived benchmark using a factor of 10 based on an empirical relationship between an acute LC ₅₀ and an EC ₂₀ . Used CCME benchmark since calculated EC ₂₀ was less than CCME benchmark.

Aquatic Receptor	Lead (mg/L)				
	Test Species	LC/EC ₅₀	Toxicity Reference Value	Reference	Comments
Aquatic Plants	<i>Myriophyllum</i> sp.	363	182	Stanley (1974)	from U.S. EPA AQUIRE (2003); EC ₅₀ (population) 32-d; derived EC ₂₅ by linear extrapolation
Phytoplankton	<i>Chlorella</i> sp.	--	0.63	U.S. EPA (1985)	from Suter and Tsao (1996); EC ₂₀ (growth inhibition)
Benthic Invertebrates	<i>Hyallela azteca</i>	0.018	0.002	Mackie (1989)	96-hr LC ₅₀ ; derived benchmark using a factor of 10 based on an empirical relationship between an acute LC ₅₀ and an EC ₂₀ .
Zooplankton	<i>Daphnia</i> sp.	--	0.02	Chapman <i>et al.</i> (1980)	from Suter and Tsao (1996); lowest chronic EC ₂₀ 21-d tests
Predator Fish	Rainbow Trout	--	0.028	Sauter <i>et al.</i> (1976)	from Suter and Tsao (1996); lowest chronic test EC ₂₀ ;
Forage Fish	Goldfish	1.66	0.415	Birge <i>et al.</i> (1979b)	from U.S. EPA AQUIRE (2003); lowest value of fathead minnow, snakehead catfish and goldfish LC ₅₀ (mortality) 7-d; derived benchmark using a factor of 4 based on an empirical relationship between a chronic LC ₅₀ and an EC ₂₀ .

TABLE 5.1-1 (Cont'd)
SUMMARY OF TOXICITY REFERENCE VALUES FOR AQUATIC SPECIES

Aquatic Receptor	Manganese (mg/L)				
	Test Species	LC/EC ₅₀	Toxicity Reference Value	Reference	Comments
Aquatic Plants	<i>Lemna minor</i>	31	15.5	Wang (1986)	from U.S. EPA AQUIRE (2003); 4-d EC ₅₀ (growth); derived EC ₂₅ by linear extrapolation
Phytoplankton	<i>Spirostomum ambiguum</i>	92.8	46.4	Nalecz-Jawecki and Sawicki (1998)	From U.S. EPA AQUIRE (2003); 24-hr EC ₅₀ (deformation); derived EC ₂₅ by linear extrapolation
Benthic Invertebrates	<i>Dugesia gonocephala</i>	46	46	Palladini <i>et al.</i> (1980)	From U.S. EPA AQUIRE (2003); 8-d NOEC (locomotion);
Zooplankton	<i>Daphnia magna</i>	4.7	2.35	Baird <i>et al.</i> (1991)	Lowest value from U.S. EPA AQUIRE (2003); 48-hr EC ₅₀ (immobility); derived EC ₂₅ by linear extrapolation
Predator Fish	Rainbow Trout	2.91	0.73	Birge (1978)	Lowest value from U.S. EPA AQUIRE (2003); 28-d LC ₅₀ (mortality); derived benchmark using a factor of 4 based on an empirical relationship between a chronic LC ₅₀ and an EC ₂₀ .
Forage Fish	Goldfish	8.22	2.06	Birge (1978)	From U.S. EPA AQUIRE (2003); 7-d LC ₅₀ (mortality); derived benchmark using a factor of 4 based on an empirical relationship between a chronic LC ₅₀ and an EC ₂₀ .

Aquatic Receptor	Nickel (mg/L)				
	Test Species	LC/EC ₅₀	Toxicity Reference Value	Reference	Comments
Aquatic Plants	<i>Lemna</i> sp.	0.45	0.22	Wang (1986)	from U.S. EPA AQUIRE (2003); EC ₅₀ (growth) 4-d; derived EC ₂₅ by linear extrapolation
Phytoplankton	<i>Microcystis</i> sp.	--	0.005*	U.S. EPA (1986)	from Suter and Tsao (1996); EC ₂₀ (incipient inhibition) chronic toxicity
Benthic Invertebrates	<i>Chironomus</i> sp.	8.6	0.86	Rehwooldt <i>et al.</i> (1973)	from U.S. EPA AQUIRE (2003); LC ₅₀ (mortality) 96-hr; derived benchmark using a factor of 10 based on an empirical relationship between an acute LC ₅₀ and an EC ₂₀ .
Zooplankton	<i>Daphnia</i> sp.	--	0.056	Munzinger (1990)	from Suter and Tsao (1996); lowest chronic test EC ₂₀
Predator Fish	Rainbow Trout	--	0.078	Nebeker <i>et al.</i> (1985)	from Suter and Tsao (1996); lowest chronic test EC ₂₀ , early life stage test
Forage Fish	Fathead Minnow	2.9	0.29	Lind <i>et al.</i> (1978)	from U.S. EPA AQUIRE (2003); LC ₅₀ (mortality) 96-hr; derived benchmark using a factor of 10 based on an empirical relationship between an acute LC ₅₀ and an EC ₂₀ .

Note: * This value is below the CCME guideline of 0.025 mg/L.

TABLE 5.1-1 (Cont'd)
SUMMARY OF TOXICITY REFERENCE VALUES FOR AQUATIC SPECIES

Aquatic Receptor	Silver (mg/L)				
	Test Species	LC/EC ₅₀	Toxicity Reference Value	Reference	Comments
Aquatic Plants	--	--	--	--	no data available
Phytoplankton	--	--	--	--	no data available
Benthic Invertebrates	--	--	--	--	no data available
Zooplankton	<i>Daphnia</i> sp.	5.8x10 ⁻³	5.8x10 ⁻⁴	Erickson <i>et al.</i> (1998)	96-h LC ₅₀ (mortality); derived benchmark using a factor of 10 based on an empirical relationship between an acute LC ₅₀ and an EC ₂₀ .
Predator Fish	Rainbow Trout	9.2x10 ⁻³	9.2x10 ⁻⁴	Erickson <i>et al.</i> (1998)	96-h LC ₅₀ (mortality); derived benchmark using a factor of 10 based on an empirical relationship between an acute LC ₅₀ and an EC ₂₀ .
Forage Fish	Goldfish	1.04x10 ⁻²	1.04x10 ⁻³	Erickson <i>et al.</i> (1998)	96-h LC ₅₀ (mortality); derived benchmark using a factor of 10 based on an empirical relationship between an acute LC ₅₀ and an EC ₂₀ .

Aquatic Receptor	Zinc (mg/L)				
	Test Species	LC/EC ₅₀	Toxicity Reference Value	Reference	Comments
Aquatic Plants	<i>Myriophyllum</i> sp.	21.6	10.8	Stanley (1974)	from U.S. EPA AQUIRE (2003); EC ₅₀ (growth) 32-d; derived EC ₂₅ by linear extrapolation
Phytoplankton	<i>Selenastrum</i> sp.	--	0.034	Site-specific	IC ₂₅ for growth from site-specific toxicity tests
Benthic Invertebrates	<i>Ceriodaphnia dubia</i>	--	0.059	Site-specific	IC ₂₅ for reproduction from site-specific toxicity tests
Zooplankton	<i>Daphnia</i> sp.	--	0.04	Chapman <i>et al.</i> (1980)	from Suter and Tsao (1996); lowest chronic value, life-cycle tests
Predator Fish	Rainbow Trout	--	0.06	Spehar (1976)	from Suter and Tsao (1996); lowest chronic test EC ₂₀
Forage Fish	Fathead Minnow	--	0.25	Site-specific	NOEC for growth based on site-specific toxicity tests.

5.2 SEDIMENT TOXICITY EVALUATIONS

The potential ecological effects on benthic invertebrates of metals in sediments were addressed in part through a comparison to sediment toxicity benchmarks. Table 5.2-1 summarizes selected sediment toxicity benchmarks reported in the literature. As seen in the table, where several toxicity benchmarks exist for a particular metal, there is a range of data for possible effects. No sediment toxicity benchmarks exist for silver hence it is not included in the table.

The Canadian Council of Ministers of the Environment (CCME 2001) guidelines provide what are designated Interim Sediment Quality Guidelines (ISQGs) and Probable Effect Levels (PELs). In narrative description, an ISQG represents the concentration below which adverse biological effects are expected to occur rarely (i.e., an ISQG represents the upper limit of the range of sediment constituent concentrations dominated by no effects data). A PEL defines the level above which adverse effects are expected to occur frequently (i.e., the PEL represents the lower limit of the range of constituent concentrations that are usually or always associated with adverse biological effects). The CCME acknowledge the associative basis of the guidelines and acknowledges that the use of SQGs in exclusion of other information (such as background concentrations of naturally occurring substances and biological tests) can lead to erroneous conclusions.

The sediment toxicity benchmarks from Thompson *et al.* (2005) and Liber and Sobey (2000) were developed for mining industry applications in northern Saskatchewan. The benchmark values reported by these authors are seen to cover a much wider range than those proposed by the CCME.

Given the differences noted in Table 5.2-1 and the uncertainties associated with sediment toxicity evaluations, a screening level assessment was carried out using the various toxicity benchmarks presented in the table. It is important to note that these benchmarks should only be used for screening purposes. An exceedance of any of these benchmarks does not mean that an adverse effect would be observed rather it means that further investigation is necessary.

TABLE 5.2-1
SEDIMENT QUALITY TOXICITY BENCHMARKS

	CCME 2003		Thompson <i>et al.</i> 2005		Liber and Sobey ^a 2000			
	ISQG	PEL	LEL	SEL	NOEC	LOEC	Growth Effects	
							IC25	IC50
COPC (µg/g)								
Arsenic	5.9	17	10	346	-	39	174	342
Cadmium	0.6	3.5	-	-	-	-	-	-
Copper	35.7	197	22	269	-	-	-	-
Lead	35	91.3	37	412	-	-	-	-
Manganese	460	1100	-	-	-	-	-	-
Nickel	18 ^b	35.9 ^b	23	484	-	210	189	312
Zinc	123	315	-	-	-	-	-	-

Note:

ISQG – Interim sediment quality guideline.

PEL - probable effect level.

LEL - lowest effect level.

SEL - severe effect level.

NOEC - no observed effect concentration.

LOEC - lowest observed effect concentration.

IC₂₅ – Inhibitory concentration that effects growth in 25% of the population

IC₅₀ – Inhibitory concentration that affects growth in 50% of the population

Dash (-) no data available.

^a – The data from Liber and Sobey (2000) for arsenic and molybdenum are based on *Chironomus tetans* in spiked-sediment toxicity tests. The authors found that *Chironomus tetans* was more sensitive to arsenic and molybdenum exposure than *Hyallela azteca*. For nickel and uranium *Hyallela azteca* is more sensitive than *Chironomus tetans*.

^b - Nickel guideline under review by CCME.

5.3 TOXICITY TO WILDLIFE

In the absence of toxicity data for most of the terrestrial animal receptors, data for laboratory animals were used in the risk assessment calculations. For mammals, the data are generally available for mice and rats. For avian receptors the test species are generally ducks or chicks. Lowest Observable Adverse Effects Levels (LOAELs) were obtained from the literature and were scaled by body weight for the various wildlife according to the equation provided by Sample *et al.* (1999), which is shown in equation (5-1).

$$LOAEL_{wildlife} = LOAEL_{testspecies} \left(\frac{BodyWeight_{testspecies}}{BodyWeight_{wildlife}} \right)^{1-b} \quad (5-1)$$

Generic factors for “b” of 1.2 for birds and 0.94 for mammals, provided by Sample *et al.* (1999) were used for scaling of all contaminants.

Toxicity reference values for the test species were collected primarily from the U.S. Department of Energy database by Sample *et al.* (1996). The background information for the toxicity reference values developed for the test species are provided in Table 5.3-1 for mammals and Table 5.3-2 for birds. These tables include test species, study duration and toxicological endpoint. Both NOAELs (no observable adverse effect levels) and LOAELs are presented on the tables. A summary of the LOAEL toxicity benchmarks (or toxicity reference values) used in the study is presented in Table 5.3-3. The LOAELs were chosen for this assessment based on the consideration that all pathways of exposure were taken into account for the receptors and no credit was taken into account for the fact that not all of the COPC intake by the receptor is bioavailable (i.e. it was assumed that 100% of the metal intake was dissolved in the gut of the species and taken into the body).

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TABLE 5.3-1: SUMMARY OF TOXICITY REFERENCE VALUES FROM LABORATORY ANIMAL STUDIES

COPC	Arsenic	Cadmium	Copper	Lead	Manganese	Nickel	Silver	Thallium	Tin	Zinc
Source of Reference values	Sample <i>et al.</i> (1996)	Sample <i>et al.</i> (1996)	Sample <i>et al.</i> (1996)	Sample <i>et al.</i> (1996)	Sample <i>et al.</i> (1996)	Sample <i>et al.</i> (1996)	ATSDR (1990)	Sample <i>et al.</i> (1996)	Sample <i>et al.</i> (1996)	Sample <i>et al.</i> (1996)
Original Reference	Schroeder & Mitchener (1971)	Sutou <i>et al.</i> (1980)	Auerlich <i>et al.</i> (1982)	Azar <i>et al.</i> (1973)	Laskey <i>et al.</i> (1982)	Ambrose <i>et al.</i> (1976)	Walker (1971)	Formigli <i>et al.</i> 1986	Davis <i>et al.</i> (1987)	Schlicker & Cox (1968)
Form of chemical	Arsenite (As ³⁺)	Cadmium Chloride	Copper Sulphate	Lead Acetate	Manganese Oxide	Nickel Sulphate Hexahydrate	Silver Nitrate	Thallium Sulphate	bis(Tributyltin) oxide (TBTO)	Zinc Oxide
Test Species	mouse	Rat	mink	Rat	rat	rat	rat	rat	Mouse	rat
Body Weight (g)	30	303	1000	350	350	350	350	350	30	350
Study Duration	3 generations (>1yr)	6 weeks	357 days	3 generations (>1yr)	From gestation to 224 days	3 generations (>1yr)	14 days	60 days	Days 6 to 15 of gestation	Days 1 to 16 of gestation
Endpoint	Reproduction	Reproduction	Reproduction	Reproduction	Reproduction	Reproduction	Mortality	Reproduction	Reproduction	Reproduction
Comments	The study was carried out during a critical life stage and is considered to be chronic exposure	The study was carried out through mating and gestation and was considered to be chronic exposure.	The study was carried out during a critical life stage and is considered to be chronic exposure	The study was carried out during a critical life stage and is considered to be chronic exposure	The study was carried out during a critical life stage and is considered to be chronic exposure	The study was carried out during a critical life stage and is considered to be chronic exposure	This study was based on short term exposure	This study was not carried out during a critical life stage and is considered to be subchronic exposure	The study was carried out during a critical life stage and is considered to be chronic exposure	The study was carried out during a critical life stage and is considered to be chronic exposure
Logic	Mice displayed declining litter sizes with each successive generation at a dose of 1.26 mg/kg/d and thus this dose was considered to be a chronic LOAEL. NOAEL derived by applying an uncertainty factor of 10 to the LOAEL.	No adverse effects were observed at the 1 mg/kg-d dose level. At the 10 mg/kg-d dose level, fetal implantations were reduced by 28%, fetal survivorship was reduced by 50% and fetal resorptions increased by 400%.	The survival of kits at 25 ppm was actually higher than the controls and this level was taken to be the NOAEL. At 50 ppm the percentage mortality in kits was increased and this was considered to be a LOAEL.	None of the Pb exposure levels affected pregnancy rate, live birth rate or other reproductive indices. However Pb exposure of 1000 ppm reduced offspring weights and produced kidney damage in young thus a LOAEL. 100 ppm is a NOAEL.	Decreased pregnancy percentage and fertility noted at the highest dose of 3550 ppm, while other reproductive parameters were not affected. This was taken as the LOAEL. No effects seen at 1100 ppm or lower and therefore NOAEL.	No adverse effects observed over 3 generations at a concentration of 500 ppm. Therefore this value considered to be a NOAEL. At 1000 ppm reduced offspring body weights were observed - LOAEL	A 2-week study on rats exposed to silver nitrate in their drinking water resulted in the death of 3 out of 12 test animals. Test animals were observed to drastically decrease their drinking water intake and appeared listless and poorly groomed. Lethality was not observed in the lower dose group.	Reduced sperm motility was observed at 10 ppm Tl, therefore a subchronic LOAEL. Converted to subchronic NOAEL by uncertainty factor of 0.01.	Reduced fetal weight and fetal survival as well as increased frequency of litter resorption were noted at 35 mg/kg-d TBTO, thus LOAEL. No effects noted at lower doses, thus NOAEL is 23.4 mg/kg-d.	No effects seen at 2000 ppm Zn therefore NOAEL. At 4000 ppm there was increased rates of fetal resorption and reduced fetal growth rates.
NOAEL(mg/(kg d))	0.13	1	11.7	8	88	40	181.2	0.0074	23.4	160
LOAEL (mg/(kg d))	1.26	10	15.14	80	284	80	362.4	0.074	35	320

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TABLE 5.3-2: SUMMARY OF TOXICITY REFERENCE VALUES FROM LABORATORY BIRD STUDIES

COPC	Arsenic	Cadmium	Copper	Lead	Manganese	Nickel	Silver	Thallium	Tin	Zinc
Source of Reference values	Sample <i>et al.</i> (1996)	Sample <i>et al.</i> (1996)	Sample <i>et al.</i> (1996)	Sample <i>et al.</i> (1996)	Sample <i>et al.</i> (1996)	Sample <i>et al.</i> (1996)	No toxicity reference values available.	No toxicity reference values available.	Sample <i>et al.</i> (1996)	Sample <i>et al.</i> (1996)
Original Reference	USFWS 1964	White and Finley (1978)	Mehring <i>et al.</i> (1960)	Edens <i>et al.</i> (1976)	Laskey and Edens (1985)	Cain and Pafford. (1978)			Schlatterer <i>et al.</i> (1993)	Stahl <i>et al.</i> (1990)
Chemical Species	Arsenite (As ³⁺)	Cadmium chloride	Copper oxide	Lead Acetate	Manganese Oxide	Nickel Sulphate			bis(Tributyltin) oxide (TBTO)	Zinc sulphate
Test Species	Mallard duck	Mallard duck	1 day old chicks	Japanese Quail	Japanese Quail	Mallard Duckling			Japanese Quail	White leghorn Hens
Body Weight (g)	1000	1153	534	150	150	782			150	1935
Study Duration	128 d (>10 wks)	90d (>10wks)	10 weeks	12 weeks	75 d (>10 wks)	90 d (>10 wks)			6 weeks	44 weeks (>10 wks)
Endpoint	Mortality	Reproduction	Growth, mortality	Reproduction	Growth, aggressive behaviour	Mortality, growth, behaviour			Reproduction	Reproduction
Comments	The study was carried out over a period greater than 10 weeks and is considered to be chronic exposure	The study was carried out over a period greater than 10 weeks during reproduction and is considered to be chronic exposure.	The 10-week study was considered to be chronic in duration.	The study was carried out over 10 weeks and was considered to be chronic	The study was carried out over longer than 10 weeks and was considered to be chronic.	The study was carried out over 10 weeks and was considered to be chronic			This study was carried out during a reproduction and was considered to be chronic	The study was carried out over 10 weeks and was considered to be chronic
Logic	Over 128 days at a dose of 100 ppm sodium arsenite the ducks experienced no mortality and thus this value is considered to be a NOAEL. A dose of 250 ppm resulted in 12% mortality and is considered to be a chronic LOAEL	At a dose of 15.2 ppm, no change in egg production was observed therefore this is considered to be a NOAEL. At 210 ppm, there was a significant decrease in egg production.	Consumption of copper up to 570 ppm had no effect on the growth of chicks and was considered to be the NOAEL. At 749 ppm there was a 30% reduction in growth and a 15% mortality. This level is considered the LOAEL.	Reproduction not impaired by the 10 ppm dose but egg hatching success reduced at the 100 ppm dose. Therefore considered the NOAEL and LOAEL respectively.	The study noted no effect on growth in birds fed 5056 ppm Mn in the diet. Aggressive behaviour was noted to be reduced by 25 to 50% relative to controls but this was not considered an adverse effect. NOAEL was taken as 977 mg/kg-d.	Consumption of up to 774 ppm Ni in diet did not increase mortality or decrease growth and is thus the NOAEL. At 1069 ppm there was a 70% mortality which is considered to be a LOAEL			Consumption of up to 60 ppm TBTO in diet did not affect reproduction, thus NOAEL. At 150 ppm, reduced egg weight and hatchability were noted and thus LOAEL.	No adverse effects seen at 228 ppm Zn therefore NOAEL. At 2028 ppm Zn a 20% decrease in egg hatchability over controls was observed. Therefore LOAEL.
NOAEL (mg/(kg d))	5.14	1.45	47	1.13	977	77.4			6.8	14.5
LOAEL (mg/(kg d))	12.84	20	61.7	11.3	-	107			16.9	130.9

TABLE 5.3-3 - SUMMARY OF LOAEL TOXICOLOGICAL REFERENCE VALUES FOR TERRESTRIAL ECOLOGICAL RECEPTORS

Ecological Receptor	LOAEL Toxicity Reference Values (mg/(kg d))										Body Weight (kg)
	Arsenic	Cadmium	Copper	Lead	Manganese	Nickel	Silver	Thallium	Tin	Zinc	
Beaver ^a	0.84	7.7	12.5	62.1	220	62.1	281	0.06	23.4	248	24.0
Black Bear ^a	0.74	6.9	10.9	54.3	193	54.3	246	0.05	20.5	217	225
Caribou ^a	0.77	7.0	11.5	56.8	202	56.8	257	0.05	21.4	227	105
Fox ^a	0.93	8.5	13.8	68.6	244	68.6	311	0.06	25.9	274	4.50
Grouse ^a	11.1	16.7	60.3	14.2	1450	96.8	2.41 ^b	0.08 ^b	21.3	98.8	0.48
Hare ^a	1.00	9.1	14.8	73.6	261	73.6	333	0.07	27.8	294	1.40
Hoary Marmot ^a	0.93	8.5	13.8	68.6	244	68.6	311	0.06	25.9	274	4.50
Mallard ^a	13.0	19.7	71.0	16.8	1710	114	2.84 ^b	0.09 ^b	25.1	116	1.08
Merganser ^a	13.9	21.0	75.6	17.8	1820	121	3.02 ^b	0.10 ^b	26.7	124	1.47
Mink ^a	1.01	9.3	15.0	74.3	264	74.3	337	0.07	28.1	297	1.20
Moose ^a	0.70	6.3	10.3	51.2	182	51.2	232	0.05	19.3	204	600
Scaup ^a	12.3	18.7	67.2	15.9	1620	108	2.69 ^b	0.09 ^b	23.7	110	0.82
Sheep ^a	0.79	7.2	11.7	58.2	207	58.2	264	0.05	22.0	232	70.0
Wolf ^a	0.82	7.4	12.1	59.9	213	59.9	272	0.06	22.6	239	43.0

Note:

Please refer to Tables 5.3-1 and 5.3-2 for discussion of laboratory toxicity reference values.

a - Toxicity values for all species are scaled according to allometric equations. See text for discussion.

b - LOAELs for birds were not available for silver or thallium, so the LOAELs presented were calculated using the mammal data as a surrogate.

5.4 TOXICITY TO HUMANS

Exposure of humans to COPC is conventionally assessed against toxicity reference values (TRVs). Toxicity is the potential of a chemical to cause some type of damage, either permanent or temporary, to the structure or functioning of any part of the body. The toxicity depends on the amount of the chemical taken into the body (generally termed the intake or dose) and the length of time a person is exposed. Every chemical has a specific dose and duration of exposure that is necessary to produce a toxic effect in humans. Toxicity assessments generally involve the evaluation of scientific studies, based either on laboratory animal tests or on workplace exposure investigations, by a number of experienced scientists in a wide range of scientific disciplines in order to determine the maximum dose that a human can be exposed to without having an adverse health effect. Levels that are likely to result in no appreciable risks or no measurable adverse effects are known as exposure limits.

For many non-carcinogenic effects, protective biological mechanisms must be overcome before an adverse effect from exposure to the chemical is manifested. For this reason, scientists generally agree that there is a level (threshold) below which no adverse effects would be measurable or expected to occur. These toxicity reference values are generally called reference doses (RfDs), tolerable daily intakes (TDIs) or acceptable daily intakes (ADIs) and are generally derived by regulatory agencies such as Health Canada and the United States Environmental Protection Agency (U.S. EPA). These TRVs are usually expressed as the quantity of a chemical per unit body weight per unit time (mg/(kg d)).

These TRVs have generally been derived for sensitive individuals in the public using the most sensitive endpoint available. Additionally, these factors involve the incorporation of “safety factors” by regulatory agencies to provide additional protection for members of the public. As discussed above, there are several regulatory sources that report TRVs. Some of the most used sources are Health Canada, U.S. EPA Integrated Risk Information System (IRIS) database; U.S. EPA health assessment reports (HEAST), U.S. EPA National Center for Environmental Assessment (NCEA), the World Health Organization (WHO) and the Agency for Toxic Substances and Disease Registry (ATSDR). Given that this assessment is being conducted under the Federal Contaminated Sites Action Program (FCSAP), TRVs provided by Health Canada were preferentially selected for evaluation of the health impacts on people. The Toxicology Evaluation Section of the Health Products and Food Branch of Health Canada has published Tolerable Daily Intakes for a number of trace elements found in foodstuff. These values were also considered for use in this assessment. In addition, the U.S. EPA IRIS database is another major source for TRVs and was used to infill data gaps in the Health Canada database.

Table 5.4-1 provides a summary of the selected oral TRVs. Oral and dermal pathways are considered in this assessment; however, there are no dermal TRVs and it is a generally accepted

practice in risk assessments to use the oral TRV to assess dermal exposure. The value, toxicological endpoint and reference for each TRV are provided in the table.

TABLE 5.4-1
HUMAN TOXICITY – ORAL DERMAL PATHWAY

COPC	Oral/Dermal				Reference
	Carcinogenic Effects		Non-carcinogenic Effects		
	Carcinogenic TRV (mg/(kg d)) ⁻¹	Endpoint	Non-Carcinogenic TRV (mg/(kg d))	Endpoint	
Arsenic	1.2 2.8	Internal Cancers Skin Cancer	n/a		Health Canada Arsenic Drinking Water Guideline (2004) Health Canada (2004)
Cadmium	n/a		0.008	Not given	Health Canada (2004)
Copper	n/a		0.03	Not given but possible liver effects	Health Canada (2004)
Lead	n/a		0.0036	Neurological Effects in children at 10 µg/dl	Health Canada (2004)
Manganese	n/a		0.14	CNS Effects	IRIS
Nickel	n/a		0.05	Not given	Health Canada (2004)
Silver	n/a		5 x 10 ⁻³	Argyria	IRIS
Thallium	n/a		8 x 10 ⁻⁵	No adverse Effect	IRIS
Tin	n/a		0.6	Liver and Kidney Lesions	HEAST
Zinc	n/a		0.566	Not given Oral = dermal	Health Canada (2005) (Personal communication with M. Richardson)

Note:

IRIS Integrated Risk Information System (U.S. EPA, 2002).
HEAST Health Effects Assessment Summary Tables (U.S. EPA, 1997).
n/a not applicable.

When data were available from more than one information source, a chain of precedence was established. Data from Health Canada were generally chosen first, followed by the IRIS database as the next choice. If data were not available in these two sources, then data were obtained from HEAST, which is part of the U.S. EPA.

Carcinogenic TRVs

Carcinogenesis is generally assumed to be a "non-threshold" type phenomenon whereby it is assumed that any level of exposure to a carcinogen poses a finite probability of generating a carcinogenic response. Carcinogenic TRVs or slope factors are used to estimate an upper-bound lifetime probability of an individual developing cancer as a result of exposure to a particular level of a potential carcinogen. The carcinogenic TRV is, therefore, the lifetime cancer risk per unit of dose.

Arsenic

Of the contaminants selected for evaluation in this study, only arsenic is considered to be a human carcinogen or probable human carcinogen. The slope factor used in this assessment represents an upper bound (95th percentile) dose-response estimate. The slope factor is conservative and is meant to protect susceptible members of the public. The slope factor for arsenic of $2.8 \text{ (mg/(kg d))}^{-1}$ was obtained from Health Canada FCSAP program and is related to the development of skin cancers. However, the Drinking Water Division of Health Canada has recently conducted an evaluation of the toxicological data relating to cancer from exposure to arsenic. In their analysis, a slope factor of $1.2 \text{ (mg/(kgd))}^{-1}$ was developed for internal cancers such as stomach and liver. In recognition of these two views, the analysis of arsenic risk was carried out using both of these slope factors.

Non Carcinogenic TRVs

The remaining COPC are considered to be non-classifiable with respect to human carcinogenicity, indicating that there are no human or animal data to indicate that they are carcinogens. The COPC falling into this category include copper, lead, manganese, nickel, silver, thallium, tin and zinc.

For many non-carcinogenic effects, protective biological mechanisms must be overcome before an adverse effect is manifested from chronic exposure to a toxicant. This is known as a "threshold" concept. Non-carcinogens are often referred to as "systemic toxicants" because of their effects on the function of various organ systems.

Cadmium

Environmental exposure to cadmium can occur via the diet and drinking water. Cadmium is transported in the blood and widely distributed in the body but accumulates primarily in the liver and kidneys (Goyer, 1991). Cadmium is excreted primarily in the urine.

Long-term exposure to cadmium primarily affects the kidneys, resulting in tubular proteinosis although other conditions such as "itai-itai" disease may involve the skeletal system.

Health Canada provides a TDI of 0.0008 mg/(kg-d) in their PQRA Guidance Manual (2004); however, no health endpoint is provided it is assumed that kidney effects are what this TRV is based on. Cadmium is considered to be carcinogenic via the inhalation pathway. However, this pathway is not being considered in this assessment. Therefore the non-carcinogenic oral TRV of 0.0008 mg/(kg-d) was used in this assessment.

Copper

Toxicity resulting from acute oral exposure to copper has been shown to occur but is quite rare because copper is a potent emetic. There is very limited data available on the effects of chronic oral exposure to copper. The liver has been demonstrated to be the sensitive target organ for copper toxicity. Rat studies suggest that kidney damage is possible at doses causing liver damage, although kidney damage may be associated with a latency period (ATSDR 2002).

Dermal exposure to copper has been shown to result in pruritic and contact allergic dermatitis, and eye irritation (ATSDR 2002, Askergren and Mellgren 1975).

Health Canada (2004) in their PQRA Guidance Manual suggest the use of a chronic TDI of 0.03 mg/kg-d, based on CCME Soil Quality Guidelines and the supporting documentation on health-based guidelines by Health Canada (1995). The supporting document (Health Canada 1995) recommends the use of an "adequate and safe" TDI of 2.0 mg/day based on HWC (1990). Normalizing to an adult's body weight of 70.7 kg, this translates into a TDI of 0.03 mg/kg-d. The toxicological basis of this exposure limit is not known.

Lead

The most sensitive target organs for lead are thought to be the nervous system, the hematopoietic system, and the cardiovascular system. Toxic effects of lead are also manifested through the kidneys, immunological and reproductive systems (ATSDR 1999).

Lead has been designated as a probable human carcinogen, but currently its critical effect endpoint is considered to be neurological effects in children. Chronic exposure to lead can also lead to nephropathy in adults and children, but has not been detected at blood levels below 40 µg/dL (Health Canada 1992).

The Joint FAO/WHO Expert Committee on Food Additives (JECFA) established a provisional tolerable weekly intake (pTWI) of 0.025 mg/kg in 1986 for lead exposure to children, and has reconfirmed this value (WHO 2000a). This is equivalent to an RfD (or tolerable daily intake, TDI) of 0.0035 mg/kg-d. This exposure limit is prescribed based on the knowledge that lead is a cumulative toxin and that any increase in lead body burdens should be avoided. The NOAEL of 0.003 to 0.004 mg/kg-d is taken from metabolic studies in infants, and was not associated with any increases in blood lead levels or lead body burdens. A LOAEL of 0.005 mg/kg-d was identified to be associated with body retention of lead. An uncertainty factor of 2 was selected because the endpoint and receptor selected were conservative, and because the studies selected were of good quality.

Health Canada (1992) adopted the JECFA pTWI. Health Canada (2004) provide a very similar oral TDI of 0.0036 mg/kg-d. However, the toxicological rationale and endpoint are not explicitly stated in Health Canada (2003) but it has been assumed to correspond to a blood lead level of 10 µg/dL.

Manganese

Manganese is essential for normal physiologic functioning in all animal species. Several diseases in humans have been associated with deficiencies and excesses of manganese intakes. Thus, any quantitative risk assessment for manganese must take into account aspects of both the essentiality and the toxicity of manganese. In humans, there is a lot of information about the range of essentiality for manganese. Additionally, there are many reports of toxicity to humans exposed to manganese by inhalation; however, very little is known about the oral toxicity of manganese. Therefore, the toxicity information on oral exposures is related to safe dietary intakes.

Health Canada (2004) has not provided a TRV for manganese.

The World Health Organization (1973) reported the average daily consumption of manganese in diets to range from 2.0-8.8 mg Mn/day. Higher manganese intakes are associated with diets high in whole-grain cereals, nuts, green leafy vegetables, and tea. From manganese balance studies, the WHO concluded that 2-3 mg/day is adequate for adults and 8-9 mg/day is "perfectly safe."

An evaluation of diets from the United States, England, and Holland reveal average daily intakes of 2.3-8.8 mg Mn/day. However, a normal intake may be well over 10 mg Mn/day, especially from a vegetarian diet. From this information taken together, the U.S. EPA concludes that an appropriate reference dose for manganese is 10 mg/day (0.14 mg/kg-day). The U.S. EPA cautions that in applying the reference dose for manganese to a risk assessment, it is important to

consider the ubiquitous nature of manganese, in that many individuals may consume about 2-5 mg Mn/day in their diet.

Nickel

The most common harmful health effect of nickel in humans is an allergic reaction. Approximately 10-20% of the population is sensitive to nickel. The most common reaction is a skin rash at the site of contact. Some sensitized people react when they consume food or water containing nickel or breathe dust containing it. Eating or drinking large amounts of nickel has been reported to affect the stomach, blood, liver, kidneys, and immune system in rats and mice, as well as their reproduction and development. Inhalation of nickel has been reported to cause carcinogenic effects; however, this pathway is not being considered in the risk assessment.

Health Canada in their PQRA guidance Manual provides a TDI for nickel sulphate of 0.05 mg/(kg-d). As it has been assumed that soluble nickel is being evaluated in this assessment, the TRV for nickel sulphate was used.

Silver

The critical effect in humans ingesting silver is a condition known as argyria. Argyria results from the deposition of silver in the dermis and also from silver-induced production of melanin and results in a permanent bluish-gray discoloration of the skin. Although silver has been shown to be uniformly deposited in exposed and unexposed skin, although the deposition of silver is permanent, it is not associated with any adverse health effects. Pathologic changes or inflammatory reactions have not been shown to result from silver deposition.

Health Canada does not provide a TRV for silver in their PQRA guidance manual.

The U.S. EPA provides a reference dose of 0.005 mg/(kg-d) based on a 2 to 9 year study in humans. A Lowest Observable Adverse Effects Level (LOAEL) of 1 g (total dose) - converted to 0.014 mg/kg/day, was determined based on the development of argyria. An uncertainty factor of 3 was applied to the LOAEL to account for minimal effects in a subpopulation which has exhibited an increased propensity for the development of argyria. This value was used in this assessment.

Thallium

The most common sources of thallium exposure are contaminated food crops and tobacco. Although normally present in the urine of humans, elevated urine thallium concentrations have been associated with adverse health effects. The primary targets of thallium toxicity are the

nervous, integumentary, and reproductive systems. In humans, acute exposures produce paresthesia, retrobulbar neuritis, ataxia, delirium, tremors, and hallucinations. Human and animal chronic exposures result in alterations of the brain, spinal cord, and peripheral nerves (RAIS 2005). In humans and animals, alopecia is the most commonly associated with long-term thallium poisoning (RAIS 2005).

Health Canada does not provide a TRV for thallium exposure.

The U.S. EPA has developed reference doses (RfDs) for subchronic and chronic oral exposure to several thallium compounds. The values have been derived from a single study where thallium treatment increased AST and LDH activities in rats, are based on NOAELs ranging from 0.23 to 0.28 mg/kg/day (IRIS 2005). The chronic RfDs are 8×10^{-5} mg/(kg-d) (thallium sulfate, chloride, and carbonate) or 9×10^{-5} mg/(kg-d) (thallium nitrate and acetate) (IRIS 2005). It was assumed in this assessment that thallium was present in the sulphate state (similar to nickel) and thus a value of 8.00×10^{-5} mg/(kg-d) was used.

Tin

Swallowing large amounts of inorganic tin compounds may cause stomachache, anemia, and liver and kidney problems. Humans exposed for a short period of time to some organic tin compounds have experienced skin and eye irritation and neurological problems; exposure to very high amounts may be lethal.

Neither Health Canada or the U.S. EPA IRIS database have reported TRVs for Tin. HEAST (1997) provides a chronic RfD for tin of 0.6 mg/(kg-d) based on liver and kidney lesions in rats. This value was used in the assessment.

Zinc

Zinc is an essential nutrient with Recommended Daily Allowance (RDA) values ranging from 5 to 15 mg/day for different age and sex categories. The RDA is an estimate of the zinc needed for growth, development, metabolism, and tissue maintenance for over 98% of the healthy population.

The Health Canada PQRA Guidance Manual does not provide a TRV for zinc; however, a personal discussion with Mark Richardson at Health Canada indicated that a value of 0.566 mg/(kg-d) was appropriate to use as a TRV for zinc. This value was used in the assessment.

6.0 RISK CHARACTERIZATION

The risk characterization results presented in this chapter combines the information provided in prior chapters on COPC levels in the environment (Chapter 2), selection and characterization of ecological species and human receptors and their exposure pathways (Chapter 3), pathways modelling results of COPC intakes by the ecological species and human receptors (Chapter 4) and identification of safe levels (toxicity reference values) for the COPC for each species (Chapter 5). In this chapter: measured and predicted water quality and sediment quality for the COPC are compared to relevant guidelines; risks to aquatic species are assessed by comparing measured and predicted water quality levels of COPC to aquatic toxicity reference values; risks to terrestrial ecological species are assessed by comparing exposure estimates from all pathways for the COPC to toxicity reference values; and the potential effects on human health of individuals who may spend time on the Anvil Range mine site are evaluated by comparing estimated intakes for of the COPC to toxicity reference values for non-carcinogenic metals and estimating the incremental lifetime risk from exposure to carcinogenic metals (i.e. arsenic in the current assessment).

6.1 AQUATIC ENVIRONMENT

6.1.1 Water Quality – Comparison to CCME Guidelines

The measured and predicted concentrations for the different scenarios considered in the assessment are compared below to Canadian water quality guidelines for the protection of aquatic life and for community water supplies from the Canadian Council of Ministers of the Environment (CCME 2003).

Existing water quality in Rose Creek and Vangorda Creek was determined using data from sampling events carried out in the 2002 to 2004 time period. For the Pelly River, the Environment Canada website and the Selkirk First Nations report were evaluated to determine existing conditions.

There are several uncertainties involved in this assessment that the reader should take into consideration. For example, there are limitations in the 2002 to 2004 water quality database on Rose Creek and Vangorda Creek watersheds; in particular, several of the measurements were reported as less than method detection limits and some measurements were reported with high method detection limits. For the purpose of calculating summary statistics, concentrations reported as less than the method detection limit (“<”) were considered as equal to ½ the detection limit with the following exceptions. For arsenic, copper and silver, the method detection limits on some samples were an order of magnitude higher than others; for these COPC, the sample results with higher detection limits were excluded from the summary statistics. In addition, it

was determined that historical measurements of copper were unreliable. These measurements were removed from the assessment for the “Existing” and “Remediation” scenarios.

6.1.1.1 Rose Creek

Table 6.1-1 provides a summary of mean COPC concentrations for the maximum month on the Rose Creek watershed for the four scenarios discussed previously. The table also includes a column of mean measured background/baseline concentrations. Monitoring stations upstream of the mine operation were considered to be representative of baseline water quality conditions and the use of these stations as background water quality is consistent with Gartner Lee Limited (2002). For Rose Creek, the upstream locations of R1 (Rose Creek south fork downstream of pump house), R6 (Anvil Creek upstream of Rose Creek) and R7 (north fork of Rose Creek upstream of Faro Creek diversion) were considered representative of baseline water quality. The downstream stations considered in this assessment include X2 and X14, which are respectively located downstream of the Faro mine and downstream of the mine and tailings management basin.

The summary statistics presented in Table 6.1-1 for Rose Creek baseline water quality are the mean concentrations of all measurements over the 2002 to 2004 period at the three baseline monitoring locations. For the downstream locations, the maximum measured monthly mean concentrations of COPC at either X2 or X14 were used in the assessment. For the other scenarios considered in the assessment, concentrations were predicted on a monthly basis and the maximum monthly concentrations at either X2 or X14 were used in the assessment. The use of the maximum monthly concentration of each COPC in the aquatic assessment ensures that exposure is not under-estimated.

A review of COPC concentration data presented in Table 6.1-1 indicates the following:

- “Existing” scenario – the measured maximum month concentrations of the COPC at the downstream stations on Rose Creek are considerably higher for all COPC than the mean measured baseline concentrations at the upstream locations. Comparison of the measured COPC concentrations to CCME water quality guidelines for protection of aquatic life indicates that cadmium, copper and lead concentrations are above the respective guidelines at the upstream stations used to characterize baseline water quality as well as at the downstream stations on Rose Creek. Silver and zinc concentrations likewise exceed aquatic protection guidelines at the downstream stations. Comparison of the measured concentrations to CCME community water supply guidelines indicates that the lead and manganese concentrations at the downstream stations are above the respective drinking water guidelines.

- “No Intervention” scenario - the maximum predicted concentrations in the Future 1 scenario are greater than the existing maximum measured concentrations for all COPC except for lead and manganese. In the Future 3 scenario, all concentrations of COPC are much higher due to the assumption of total oxidation of the rock resulting in an increase in the levels in Rose Creek. Comparison of the predicted COPC concentrations to CCME guidelines for protection of aquatic life indicates that all COPC (excepting manganese for which a guideline has not been established) are considerably higher in both the Future 1 and Future 3 scenarios. Similarly, the predicted arsenic, cadmium, copper, lead, manganese and zinc levels are greater than the CCME community water supply guidelines in both the Future 1 and Future 3 scenarios, with exception of the copper concentration in the Future 1 scenario.
- “Remediation” scenario – the predicted COPC concentrations in the Future 2 scenario are lower than expected in the “No Intervention” Future 1 and Future 3 scenarios for all COPC but higher than reported for the “Existing” scenario for all COPC except arsenic, manganese and silver. In the Future 3 scenario, the COPC concentrations, excepting manganese are all higher than reported for the “Existing” scenario. Most notably, the zinc concentration predicted at the downstream locations in Rose Creek in the “Remediation” scenario (Future 3) is much higher than measured over the 2002 to 2004 period (i.e. maximum month concentration of 4,920 µg/L vs. 75.8 µg/L). Comparison of the predicted COPC concentrations to CCME guidelines for protection of aquatic life indicates that the cadmium, copper, lead, silver and zinc concentrations are considerably higher in both the Future 2 (excepting silver) and Future 3 scenarios. Comparing the measured COPC concentrations to CCME community water supply guidelines indicates exceedances in both the “Remediation” scenarios (cadmium, lead and manganese).
- “Treat All Flows” scenario - it is noted that the predicted concentrations of silver are essentially equivalent to the upstream or baseline concentrations. The copper concentration in this scenario is predicted to be above baseline conditions because the baseline dataset in this scenario considers anomalously high values. The predicted concentrations of manganese and zinc are within the variability of the background water quality. Arsenic and zinc concentrations fall within the range of measured values at the upstream and downstream monitoring stations in recent years. The predicted cadmium and nickel concentrations are expected to likely be greater than both the mean baseline concentration and the measured maximum monthly concentration at the downstream sites. Comparison of the predicted COPC concentrations to CCME water quality guidelines for protection of aquatic life indicates that predicted cadmium, copper, lead and zinc concentrations are above the respective guidelines. Only lead however, is above the CCME community water supply guideline.

TABLE 6.1-1
WATER QUALITY IN ROSE CREEK UNDER DIFFERENT SCENARIOS
CONSIDERED IN RISK ASSESSMENT

COPC	Unit	CCME Aquatic Life Guideline	CCME Drinking Water Guideline	Rose Creek Baseline	"Existing" Scenario	Assessment Scenarios				
						"No Intervention"		"Remediation"		"Treat All Flows"
						Future 1	Future 3	Future 2	Future 3	Future 3
						Downstream at X2 or X14	Downstream at X2 or X14	Downstream at X2 or X14	Downstream at X2 or X14	Downstream at X2 or X14
Upstream at R1, R6 and R7					Downstream at X2 or X14	Downstream at X2 or X14	Downstream at X2 or X14	Downstream at X2 or X14	Downstream at X2 or X14	Downstream at X2 or X14
Measured Annual Mean					Measured Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month
Arsenic	µg/L	5	25	0.76	4.33	39.2	716	3.56	21.7	3.18
Cadmium	µg/L	0.017	5	0.20	0.78	22.4	222	2.9	7.0	2.8
Copper ^{a)}	µg/L	2	1000 ^{d)}	0.86	3.0	873	7686	19	132	4.77
Lead ^{b)}	µg/L	1	10	1.37	12.5	12.3	74.8	14.1	15.0	14.4
Manganese	µg/L	-	50 ^{d)}	28.3	2223	1479	23648	56	682	32.6
Nickel ^{c)}	µg/L	25	-	0.97	8.75	27.0	242	14.2	17.4	14.1
Silver	µg/L	0.1	-	0.10	0.71	1.5	10.0	0.13	0.25	0.10
Zinc	µg/L	30	5000 ^{d)}	25.6	75.8	15707	164599	445	4920	41.5

Notes:

- predicted concentrations greater than CCME Aquatic Life Guideline
Underline predicted concentrations greater than CCME Drinking Water Guideline
^{a)} Copper guideline for water with hardness ≤ 120 mg/L CaCO₃
^{b)} Lead guideline for water with hardness ≤ 60 mg/L as CaCO₃
^{c)} Nickel guideline for water with hardness ≤ 60 mg/L as CaCO₃
^{d)} Guidelines are for aesthetic concerns
 "-" no data available

6.1.1.2 Vangorda Creek

Table 6.1-2 provides a summary of the water quality data for the Vangorda Creek watershed. Monitoring data from the 2002 to 2004 period were used to characterize existing water quality for locations upstream and downstream of the Grum and Vangorda mines. Stations upstream of the mines are considered to be representative of background or baseline water quality conditions and the use of these stations as baseline water quality is consistent with Gartner Lee Limited (2002). For Vangorda Creek, the upstream locations of V1 (Vangorda Creek upstream of mine activities), V4 (Shrimp Creek) and V20 (Vangorda Creek northeast diversion ditch) were considered representative of baseline water quality. Stations downstream of the mine are assumed to be influenced by the mine workings. For this assessment, station V27 was selected as the most appropriate downstream location.

For the upstream locations, the summary statistics provided in Table 6.1-2 are the mean concentrations calculated from the 2002 to 2004 period from all samples taken at three upstream locations. For the downstream location, the mean measured concentrations for the maximum month at V27 were used in the assessment to describe existing conditions. For the other scenarios considered in the assessment, concentrations were predicted on a monthly basis and the maximum monthly concentrations at V27 were used.

TABLE 6.1-2
WATER QUALITY IN VANGORDA CREEK UNDER DIFFERENT SCENARIOS
CONSIDERED IN RISK ASSESSMENT

COPC	Unit	CCME Aquatic Life Guideline	CCME Drinking Water Guideline	Vangorda Creek Baseline	"Existing" Scenario	Assessment Scenarios				
						"No Intervention"		"Remediation"		"Treat All Flows"
						Future 1	Future 3	Future 2	Future 3	Future 3
						Downstream at V27	Downstream at V27	Downstream at V27	Downstream at V27	Downstream at V27
				Upstream at V1, V4, V20	Downstream at V27	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month
Arsenic	µg/L	5	25	2.99	9.83	17.5	17.5	4.51	4.51	4.30
Cadmium	µg/L	0.017	5	0.27	1.17	29.7	190	2.75	3.52	2.83
Copper ^{a)}	µg/L	2	1000 ^{d)}	1.3	2.0	221	3879	3.5	18.8	16.3
Lead ^{b)}	µg/L	1	10	3.39	4.7	23.0	69.1	14.7	14.9	15.1
Manganese	µg/L	-	50 ^{d)}	15.9	18.7	8128	58481	30.9	279	27.5
Nickel ^{c)}	µg/L	25	-	3.76	7.33	134	514	16.3	18.7	15.5
Silver	µg/L	0.1	-	0.46	0.18	0.99	0.99	0.46	0.46	0.45
Zinc	µg/L	30	5000 ^{d)}	13.7	124	24042	158006	52.3	727	40.0

Notes:

- predicted concentrations greater than CCME Aquatic Life Guideline
Underline predicted concentrations greater than CCME Drinking Water Guideline
^{a)} Copper guideline for water with hardness ≤ 120 mg/L CaCO₃
^{b)} Lead guideline for water with hardness ≤ 60 mg/L as CaCO₃
^{c)} Nickel guideline for water with hardness ≤ 60 mg/L as CaCO₃
^{d)} Guidelines are for aesthetic concerns
 "-" no data available

From a review of the data presented on Table 6.1-2, the following observations can be made:

- "Existing" scenario – the maximum month mean measured concentrations of all COPC except silver at the downstream location on Vangorda Creek (V27) are greater than the measured mean baseline concentrations.
- "No Intervention" scenario – the maximum month predicted concentrations of all COPC in the Future 1 scenario are greater than the maximum month measured concentrations at the downstream monitoring location (V27) and several times greater than the mean measured baseline concentrations at the baseline monitoring locations (V1, V4 and V20). In the Future 3 scenario, the maximum month predicted COPC concentrations of cadmium, copper, lead, manganese, nickel and zinc are considerable greater than the predicted concentrations in the Future 1 scenario. The predicted concentrations of all COPC (other than manganese) are greater than the CCME guidelines for protection of aquatic life. Several of predicted concentrations in both the near term and long term (future) also exceed CCME community drinking water guidelines.
- "Remediation" scenario – the maximum month predicted concentrations in both the Future 2 and Future 3 scenarios are much lower than the comparable concentrations predicted for the "No Intervention" scenario. Compared to the measured concentration over the 2002 to 2004 period, the predicted concentrations of some COPC in the "Remediation" Future 2 scenario are lower (i.e. arsenic and zinc), while the other COPC are higher (i.e. cadmium, copper, lead, manganese, nickel and silver). In the Future 3

scenario when the maximum acid generating potential is realized, the predicted concentrations of all COPC excepting arsenic are higher than measured over the 2002 to 2004 period. Other than silver, the predicted concentrations of the remaining COPC in the “Remediation” Future 2 scenario are greater than the upstream baseline concentrations. In the “Remediation” Future 3 scenario, only the predicted silver concentrations are comparable to the baseline concentration. The predicted concentrations of all other COPC are typically 1.5 to 53 times higher than the baseline concentrations given on Table 6.1-2. Other than arsenic, manganese and nickel, the predicted concentrations in the Future 2 and Future 3 scenarios are greater than CCME guidelines for protection of aquatic life. CCME guidelines for community water supplies are also exceeded for lead (in both the Future 2 and Future 3 scenarios) and manganese (Future 3 only).

- “Treat All Flows” scenario – the predicted arsenic and nickel concentrations, although greater than the baseline upstream concentrations, are below the CCME guidelines for protection of aquatic life. The predicted silver concentration is comparable to upstream baseline concentrations but is greater than CCME guidelines for protection of aquatic life. The predicted cadmium, lead and zinc concentrations for the “Treat All Flows” scenario are greater than both baseline concentrations and CCME guidelines for protection of aquatic life. The predicted manganese concentration is approximately twice the upstream baseline concentration but less than the CCME guidelines for community water supplies. Only the predicted lead concentrations exceed the CCME community water supply guidelines.

6.1.1.3 Anvil Creek

Table 6.1-3 provides a summary of the predicted water quality at the mouth of Anvil Creek. This creek is immediately downstream of Rose Creek and, as expected, the predicted concentrations for all the COPC are lower than those predicted for Rose Creek (Table 6.1-1). Not surprisingly, the “No Intervention” Future 3 scenario represents the worst water quality and all CCME guidelines are exceeded in this scenario excepting nickel in the Future 1 scenario. In the “Remediation” scenario, the CCME guidelines for protection of aquatic life are also exceeded in Future 2 and Future 3 scenarios for all COPC except arsenic and nickel. The “Treat All Flows” scenario represents the best water quality for all the COPC. In this scenario, CCME aquatic protection guidelines are not exceeded for arsenic, nickel and silver. The community water supply guideline for manganese is exceeded in all the scenarios except the “Treat All Flows” scenario. Community water supply guidelines for arsenic, cadmium, copper, lead and zinc are also exceeded in the “No Intervention” Future 3 scenario.

TABLE 6.1-3
WATER QUALITY IN ANVIL CREEK UNDER DIFFERENT SCENARIOS
CONSIDERED IN RISK ASSESSMENT

COPC	Unit	CCME Aquatic Life Guideline	CCME Drinking Water Guideline	Existing Scenario	Assessment Scenarios				
					"No Intervention"		"Remediation"		"Treat All Flows"
					Future 1	Future 3	Future 2	Future 3	Future 3
					Mouth of Anvil Creek	Mouth of Anvil Creek	Mouth of Anvil Creek	Mouth of Anvil Creek	Mouth of Anvil Creek
				Anvil Creek D/S of Rose Creek					
				Measured (July 2004)	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month
Arsenic	µg/L	5	25	0.4	11.3	201	1.74	5.0	1.65
Cadmium	µg/L	0.017	5	0.02	6.4	62	0.98	2.0	0.98
Copper ^{a)}	µg/L	2	1000 ^{d)}	1	248	2158	9	35	4.58
Lead ^{b)}	µg/L	1	10	0.5	4.7	22.2	5.3	5.6	5.5
Manganese	µg/L	-	50 ^{d)}	31	435	6651	36	139	29.6
Nickel ^{c)}	µg/L	25	-	0.9	8.4	69	4.9	5.8	5.0
Silver	µg/L	0.1	-	0.2	0.5	2.9	0.11	0.14	0.10
Zinc	µg/L	30	5000 ^{d)}	15	4423	46171	148	997	30.3

Notes:

- predicted concentrations greater than CCME Aquatic Life Guideline
- Underline predicted concentrations greater than CCME Drinking Water Guideline
- ^{a)} Copper guideline for water with hardness ≤ 120 mg/L CaCO_3
- ^{b)} Lead guideline for water with hardness ≤ 60 mg/L as CaCO_3
- ^{c)} Nickel guideline for water with hardness ≤ 60 mg/L as CaCO_3
- ^{d)} Guidelines are for aesthetic concerns
- "-" no data available

6.1.1.4 Pelly River

Table 6.1-4 provides a summary of the water quality data in the Pelly River at Pelly Crossing. Comparison of the measured concentrations to CCME water quality guidelines indicate that measured levels of arsenic, cadmium, copper, lead, silver and zinc are above the respective guidelines for the protection of aquatic life. Measured manganese concentrations in the "Existing" scenario and the "No Intervention" Future 3 scenario exceed the CCME drinking water quality guideline which is based on aesthetic concerns. In the "Remediation" and "Treat All Flows" scenarios, COPC concentrations are similar with the notable exception of zinc in the Future 3 scenario. Predicted concentrations of cadmium, copper and lead exceed CCME guidelines for the protection of aquatic life in these scenarios and the zinc concentration exceeds the CCME guideline in the "Remediation" Future 3 scenario. None of the predicted concentrations exceed the CCME community water supply guidelines.

TABLE 6.1-4
WATER QUALITY IN THE PELLY RIVER AT PELLY CROSSING UNDER
DIFFERENT SCENARIOS CONSIDERED IN RISK ASSESSMENT

COPC	Unit	CCME Aquatic Life Guideline	CCME Drinking Water Guideline	Existing Scenario	Assessment Scenarios				
					"No Intervention"		"Remediation"		"Treat All Flows"
					Future 1	Future 3	Future 2	Future 3	Future 3
				Measured Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month
Arsenic	µg/L	5	25	5.97	0.87	5.58	0.61	0.70	0.61
Cadmium	µg/L	0.017	5	1.49	0.70	2.35	0.51	0.54	0.52
Copper ^{a)}	µg/L	2	1000 ^{d)}	15.8	11.4	64.7	5.08	5.75	4.98
Lead ^{b)}	µg/L	1	10	6.54	4.30	4.81	4.30	4.31	4.30
Manganese	µg/L	-	50 ^{d)}	279	41.0	279	14.7	17.8	14.6
Nickel ^{c)}	µg/L	25	-	16.6	1.42	3.52	1.1	1.15	1.12
Silver	µg/L	0.1	-	0.20	0.014	0.073	0.005	0.005	0.004
Zinc	µg/L	30	5000 ^{d)}	77.0	165	1419	11.9	35	9.14

Notes:

-  predicted concentrations greater than CCME Aquatic Life Guideline
- Underline predicted concentrations greater than CCME Drinking Water Guideline
- ^{a)} Copper guideline for water with hardness ≤ 120 mg/L CaCO₃
- ^{b)} Lead guideline for water with hardness ≤ 60 mg/L as CaCO₃
- ^{c)} Nickel guideline for water with hardness ≤ 60 mg/L as CaCO₃
- ^{d)} Guidelines are for aesthetic concerns
- "-" no data available

6.1.2 Sediment Quality

The sediment concentrations in the three different watersheds considered in this assessment were derived from either from measured data ("Existing" scenario) or from the water quality predictions for all other scenarios. These water concentrations were multiplied by a sediment distribution coefficient (k_D) in order to derive a sediment concentration.

Measured metal levels in surface water and sediment samples collected at coincident monitoring stations at the same time were used to calculate site-specific transfer factors. These transfer factors were used to predict sediment levels for each of the remediation scenarios at the downstream locations in Rose Creek, Vangorda Creek and the Pelly River. An implicit assumption in the estimation of sediment quality using transfer factors is that metal exchange between the water column and sediments occurs rapidly in response to changes in water column concentrations resulting in a new equilibrium being established in the creek/river sediments. This is not a completely accurate representation of the processes controlling metal exchange as a portion of the metal content in sediments is present as non-leachable chemical species (e.g. as sulphide minerals). Furthermore, a portion of the sediments may be comprised of fines washed from the waste rock dumps and tailings impoundment. Nonetheless, the transfer factor approach has generally been found to be sufficiently accurate for most applications. For all COPC, site-specific distributions were used as described in Chapter 2.

A summary of the mean measured quality for existing conditions and predicted quality for the remediation scenarios is presented in Table 6.1-5 (for Rose Creek), Table 6.1-6 (for Vangorda Creek), Table 6.1-7 (Anvil Creek) and Table 6.1-8 (for Pelly River). It should be noted that the use of the site-specific distribution coefficients resulted in predicted concentrations that were similar to the measured data in both Rose Creek and Vangorda Creek.

TABLE 6.1-5
SEDIMENT QUALITY IN ROSE CREEK UNDER DIFFERENT SCENARIOS
CONSIDERED IN RISK ASSESSMENT

COPC	Unit	Existing Scenario		Assessment Scenarios				
				"No Intervention"		"Remediation"		"Treat All Flows"
				Future 1	Future 3	Future 2	Future 3	Future 3
		Upstream at R1, R6 and R7 ^{a)}	Downstream at X2 and X14 ^{a)}	Downstream at X2 and X14 ^{b)}	Downstream at X2 and X14 ^{b)}	Downstream at X2 and X14 ^{b)}	Downstream at X2 and X14 ^{b)}	Downstream at X2 and X14 ^{b)}
		Predicted Mean	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average
Arsenic	mg/kg dw	6.9	16.8	172	2816	14	71	13.1
Cadmium	mg/kg dw	0.5	0.7	17	242	2	8	2
Copper	mg/kg dw	43	42	9392	114562	396	2507	228
Lead	mg/kg dw	41	137	171	875	128	143	128
Manganese	mg/kg dw	510	10343	7362	159073	675	4194	525
Nickel	mg/kg dw	16.6	46.9	156	1522	66.0	95.9	63.7
Silver	mg/kg dw	0.09	0.27	0.41	2.65	0.09	0.14	0.09
Zinc	mg/kg dw	202	263	32879	502415	1046	13020	228

Notes: a) Sediment concentrations for these sites were predicted from measured mean and annual average water concentrations and Kd estimates.

b) Sediment concentrations for these sites were derived from predicted annual average water concentrations and Kd estimates

TABLE 6.1-6
SEDIMENT QUALITY IN VANGORDA CREEK UNDER DIFFERENT SCENARIOS
CONSIDERED IN RISK ASSESSMENT

COPC	Unit	Existing Scenario		Assessment Scenarios				
				"No Intervention"		"Remediation"		"Treat All Flows"
		Upstream at V1, V4 and V20 ^{a)}	Downstream at V27 ^{a)}	Future 1	Future 3	Future 2	Future 3	Future 3
				Downstream at V27 ^{b)}	Downstream at V27 ^{b)}	Downstream at V27 ^{b)}	Downstream at V27 ^{b)}	Downstream at V27 ^{b)}
		Predicted Mean	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average
Arsenic	mg/kg dw	27	58	93	93	36	36	35
Cadmium	mg/kg dw	0.8	1.8	40	253	4.2	5.2	4.3
Copper	mg/kg dw	66	75	5733	93202	136	509	702
Lead	mg/kg dw	102	133	388	1049	271	275	278
Manganese	mg/kg dw	286	273	70132	503566	430	2612	401
Nickel	mg/kg dw	64.0	76.5	1131	4221	174	194	168
Silver	mg/kg dw	0.40	0.12	0.6	0.6	0.34	0.34	0.34
Zinc	mg/kg dw	108	714	90919	597025	289	2895	241

Notes: a) Sediment concentrations for these sites were predicted from measured mean and annual average water concentrations and Kd Estimates.

b) Sediment concentrations for these sites were derived from predicted annual average water concentrations and Kd estimates.

TABLE 6.1-7
SEDIMENT QUALITY IN PELLY RIVER AT MOUTH OF ANVIL CREEK UNDER
DIFFERENT SCENARIOS CONSIDERED IN RISK ASSESSMENT

COPC	Unit	Existing Scenario	Assessment Scenarios				
			"No Intervention"		"Remediation"		"Treat All Flows"
		Anvil Creek D/S of Rose Creek	Future 1	Future 3	Future 2	Future 3	Future 3
			Mouth of Anvil Creek	Mouth of Anvil Creek	Mouth of Anvil Creek	Mouth of Anvil Creek	Mouth of Anvil Creek
		Measured (July 2004)	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average
Arsenic	mg/kg dw	3.6	51	768	12	24	11.4
Cadmium	mg/kg dw	0.06	7.7	72	1.4	2.6	1.4
Copper	mg/kg dw	50	4726	41770	324	826	227
Lead	mg/kg dw	15	89	300	93	96	95
Manganese	mg/kg dw	558	3446	49202	566	1304	518
Nickel	mg/kg dw	15.3	69	483	43.6	50.0	44.2
Silver	mg/kg dw	0.176	0.22	1.01	0.09	0.10	0.09
Zinc	mg/kg dw	118.5	14286	149380	554	3208	217

Notes: a) Sediment concentrations for these sites were predicted from measured mean and annual average water concentrations and Kd estimates

b) Sediment concentrations for these sites were derived from predicted annual average water concentrations and Kd estimates

TABLE 6.1-8
SEDIMENT QUALITY IN PELLY RIVER AT PELLY CROSSING UNDER
DIFFERENT SCENARIOS CONSIDERED IN RISK ASSESSMENT

COPC	Unit	Existing Scenario	Assessment Scenarios				
			"No Intervention"		"Remediation"		"Treat All Flows"
		Predicted Annual Average	Future 1	Future 3	Future 2	Future 3	Future 3
Arsenic	mg/kg dw	12.1	6.5	24.8	5.4	5.8	5.4
Cadmium	mg/kg dw	0.7	1.6	3.5	1.4	1.4	1.4
Copper ^{a)}	mg/kg dw	164	373	1444	251	264	249
Lead ^{b)}	mg/kg dw	29	127	134	127	127	127
Manganese	mg/kg dw	935	453	2220	260	282	259
Nickel ^{c)}	mg/kg dw	61.7	20.0	34.8	17.9	18.0	17.9
Silver	mg/kg dw	0.11	0.01	0.03	0.00	0.00	0.00
Zinc	mg/kg dw	114	585	4733	79	151	70

Notes: a) Sediment concentrations for these sites were predicted from measured mean and annual average water concentrations and Kd estimates.

b) Sediment concentrations for these sites were derived from predicted annual average water concentrations and Kd estimates.

To simplify the review, the mean sediment COPC concentrations, presented on Tables 6.1-5 to 6.1-8, were divided by the toxicity benchmarks presented on Table 5.2-1 to obtain the screening index values. The SI values are presented on Table 6.1-9 (Rose Creek), Table 6.1-10 (Vangorda Creek), Table 6.1-11 (Anvil Creek) and Table 6.1-12 (Pelly River). Screening index values less than 1 indicate that the predicted levels are below the corresponding benchmarks. Values greater than 1 suggest that there is potential of observing adverse effects on some species. These numbers are shown as **bold** numbers on the tables. It is noted that many factors affect the availability of metals in sediment and hence their toxicity (e.g. grain size distribution and organic content).

TABLE 6.1-9
SEDIMENT SCREENING INDEX VALUES IN ROSE CREEK UNDER DIFFERENT
SCENARIOS CONSIDERED IN RISK ASSESSMENT

COPC, Source and Type of Sediment Toxicity Benchmark	Sediment Toxicity Benchmark (mg/kg)	Rose Creek Baseline	"Existing" Scenario	Assessment Scenarios					
				"No Intervention"		"Remediation"		"Treat All Flows"	
				Future 1	Future 3	Future 2	Future 3	Future 3	
				Upstream at R1, R6 and R7 ^{a)}	Downstream at X2 and X14 ^{a)}	Downstream at X2 and X14 ^{b)}	Downstream at X2 and X14 ^{b)}	Downstream at X2 and X14 ^{b)}	Downstream at X2 and X14 ^{b)}
				Predicted Mean	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average
Arsenic									
CCME 1999	TEL	5.9	1.18	2.8	29	477	2.4	12.1	2.23
	PEL	17	0.41	0.99	10.1	166	0.83	4.19	0.77
Thompson <i>et al.</i> 2002	LEL	10	0.69	1.68	17.2	282	1.4	7.1	1.31
	SEL	346	0.02	0.05	0.50	8.1	0.04	0.21	0.04
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-	-
	LOEC	39	0.18	0.43	4.4	72	0.36	1.83	0.34
	IC ₂₅ ^{d)}	174	0.04	0.10	0.99	16	0.08	0.41	0.08
	IC ₅₀ ^{d)}	342	0.02	0.05	0.50	8.2	0.04	0.21	0.04
Cadmium									
CCME 1999	TEL	0.6	0.90	1.2	29	404	3.6	12.9	3.4
	PEL	3.5	0.15	0.20	4.9	69	0.62	2.22	0.58
Thompson <i>et al.</i> 2002	LEL	-	-	-	-	-	-	-	-
	SEL	-	-	-	-	-	-	-	-
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-	-
Copper									
CCME 1999	TEL	36	1.20	1.2	263	3209	11.1	70.2	6.38
	PEL	197	0.22	0.21	47.7	582	2.0	12.7	1.16
Thompson <i>et al.</i> 2002	LEL	22	1.95	1.9	427	5207	18	114	10.4
	SEL	269	0.16	0.16	34.9	426	1.5	9.3	0.85
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-	-
Lead									
CCME 1999	TEL	35	1.17	3.9	4.9	25.0	3.7	4.1	3.7
	PEL	91	0.45	1.50	1.9	9.6	1.4	1.6	1.41
Thompson <i>et al.</i> 2002	LEL	37	1.11	3.7	4.6	23.6	3.5	3.9	3.5
	SEL	412	0.10	0.33	0.41	2.12	0.31	0.35	0.31
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-	-
Manganese ^{c)}									
CCME 1999	TEL	460	1.11	22.5	16.0	346	1.47	9.12	1.14
	PEL	1100	0.46	9.4	6.7	145	0.61	3.81	0.48
Thompson <i>et al.</i> 2002	LEL	-	-	-	-	-	-	-	-
	SEL	-	-	-	-	-	-	-	-
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-	-
Nickel									
CCME 1999	TEL	18	0.92	2.61	8.67	84.5	3.67	5.33	3.54
	PEL	36	0.46	1.31	4.35	42.4	1.84	2.67	1.78
Thompson <i>et al.</i> 2002	LEL	23	0.72	2.04	6.79	66.2	2.87	4.17	2.77
	SEL	484	0.03	0.10	0.32	3.14	0.14	0.20	0.13
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-	-
	LOEC	210	0.08	0.22	0.74	7.25	0.31	0.46	0.30
	IC ₂₅ ^{d)}	189	0.09	0.25	0.83	8.05	0.35	0.51	0.34
	IC ₅₀ ^{d)}	312	0.05	0.15	0.50	4.88	0.21	0.31	0.20
Zinc									
CCME 1999	TEL	123	1.64	2.14	267	4085	8.5	106	1.85
	PEL	315	0.64	0.83	104	1595	3.3	41.3	0.72
Thompson <i>et al.</i> 2002	LEL	-	-	-	-	-	-	-	-
	SEL	-	-	-	-	-	-	-	-
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-	-
Notes:									
^{a)} Sediment concentrations for these sites were predicted from measured mean and annual average water concentrations and Kd estimates.									
^{b)} Sediment concentrations for these sites were derived from predicted annual average water concentrations and Kd estimates.									
^{c)} Manganese sediment quality guidelines taken from MOE (1993) as they were not available from any other source.									
^{d)} IC ₂₅ and IC ₅₀ benchmarks are for growth effects.									

6.1.2.1 Rose Creek

Comparison of the mean measured sediment concentrations at upstream locations on Rose Creek to sediment toxicity benchmarks indicate that arsenic, cadmium, lead, manganese and zinc were above effects levels (see Table 6.1-9). This is not surprising given that mining has occurred in the area and is indicative of the natural mineralization in the area. At downstream locations, the measured COPC concentrations in the “Existing” scenario are higher than recorded at the upstream locations and copper and nickel as well as the other COPC discussed above are above sediment toxicity benchmarks indicative of some level of potential effect. Again, this finding is indicative of the past mining activities at the Anvil Range Mine Complex.

Biological sampling was carried out on Rose Creek in 2004 by Laberge Environmental Services. The results of this assessment indicated at the downstream location R2 (similar to X14 in Table 6.1-9), there is a high abundance of benthic communities. In fact, the highest populations of benthic organisms were present at R1 (X2) and R2 (X14) in 2004. In addition the report states that.... *“The stream sediments here (R2) contained the highest concentration of metals with several parameters exceeding the probably effects level. These concentrations would indicate a high incidence of adverse effects to the biotic community, however population numbers were high at R2, the community was diverse and there was good representation of chemical sensitive organisms. These data would indicate that although high concentrations of metals exist in the stream sediments, they presumably are not in a bioavailable form.”*

Under the “No Intervention” scenario, particularly the Future 3 conditions, sediment concentrations are predicted to be much higher than under “Existing” conditions and thus screening index (SI) values are substantially greater than 1 for all COPC. This observation suggests that there is an increased potential for adverse effects on sediment dwelling communities under the “No Intervention” scenario.

In the “Remediation” scenario, sediment concentrations are also substantially greater than they are currently, especially in the Future 3 scenario. In the Future 2 scenario, the sediment concentrations are similar to “Existing” conditions with the exception of cadmium, copper and zinc. Therefore, it is unlikely that adverse effects will be observed in the Future 2 scenario. Due to the fact that SI values for cadmium, copper and zinc are greater than 1 in the Future 3 scenario, and substantially greater than the “Existing” scenario, it is anticipated that there may be potential adverse effects in sediment dwelling organisms under the “Remediation” Future 3 scenario considered in this assessment. The extent of the adverse effects is not known.

In the “Treat All Flows” scenario, concentrations of arsenic, lead, nickel and zinc are similar to those measured under “Existing” conditions. Biological studies on Rose Creek indicate that there are healthy benthic communities currently in Rose Creek indicating that under the “Treat All Flows” scenario there would possibly be no adverse effects on benthic communities.

6.1.2.2 Vangorda Creek

For Vangorda Creek (see Table 6.1-10), toxicity benchmarks are exceeded for all of the COPC at the upstream locations with the exception of manganese and zinc. The elevated levels at the upstream locations are presumably due to natural mineralization. COPC concentrations at the downstream location are marginally higher than measured at the upstream locations with the exception of manganese which is similar and zinc which is several times higher.

Laberge Environmental has carried out several studies on Vangorda Creek from 1991 to 2001 (Gartner Lee 2002). The benthic community studies indicated *“an increase in benthic abundance over time”* and that *“at stations V27 and V8, located downstream of mine facilities, benthic communities have generally greater abundance and richness than the upstream reference site V1.”* The overall conclusion of the studies on Vangorda Creek is that *“mining activities and elevated sediment metal concentrations have not had an observable impact on benthic communities and that “overall the community structure appears to be stable over time.””*

Under the “No Intervention” scenario, particularly Future 3 conditions, sediment concentrations are predicted to be much higher than under existing conditions and thus screening index (SI) values are substantially greater than 1 for all COPC. This observation suggests that there is increased potential for adverse effects in sediment dwelling communities under the “No Intervention” scenario.

In the “Remediation” scenario, sediment concentrations are greater than they are currently with the exception of arsenic and zinc in the Future 2 scenario. The Future 3 scenario has substantially higher concentrations as expected. As many of the SI values are much greater than 1, it is anticipated that there may be potential adverse effects on sediment dwelling organisms in the “Remediation” Future 3 scenario considered in this assessment. The extent of the adverse effects is not known. In general, the Future 2 scenario has SI values that are similar to the “Existing” scenario indicating that it is unlikely that adverse effects will be observed in sediment communities.

In the “Treat All Flows” scenario, concentrations of arsenic, copper, lead, manganese and zinc are similar to those measured under “Existing” conditions. Biological studies on Vangorda Creek indicate that there are healthy benthic communities currently in Vangorda Creek which suggests that under the “Treat All Flows” scenario there would possibly be no adverse effects on benthic communities.

TABLE 6.1-10
SEDIMENT SCREENING INDEX VALUES IN VANGORDA CREEK UNDER
DIFFERENT SCENARIOS CONSIDERED IN RISK ASSESSMENT

COPC, Source and Type of Sediment Toxicity Benchmark	Sediment Toxicity Benchmark (mg/kg)	Vangorda Creek Baseline	"Existing" Scenario	Assessment Scenarios					
				"No Intervention"		"Remediation"		"Treat All Flows"	
				Future 1	Future 3	Future 2	Future 3	Future 3	Future 3
				Downstream at V27 ^{a)}	Downstream at V27 ^{a)}	Downstream at V27 ^{a)}	Downstream at V27 ^{a)}	Downstream at V27 ^{a)}	Downstream at V27 ^{a)}
		Predicted Mean	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average
Arsenic									
CCME 1999	TEL	5.9	4.6	9.9	15.7	15.7	6.2	6.2	6.0
	PEL	17	1.6	3.4	5.5	5.5	2.14	2.14	2.09
Thompson <i>et al.</i> 2002	LEL	10	2.7	5.8	9.3	9.3	3.6	3.6	3.5
	SEL	346	0.08	0.17	0.27	0.27	0.11	0.11	0.10
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-	-
	LOEC	39	0.70	1.50	2.38	2.38	0.93	0.93	0.91
	IC ₂₅ ^{d)}	174	0.16	0.34	0.53	0.53	0.21	0.21	0.20
	IC ₅₀ ^{d)}	342	0.08	0.17	0.27	0.27	0.11	0.11	0.10
Cadmium									
CCME 1999	TEL	0.6	1.3	2.9	66.5	422	6.9	8.7	7.1
	PEL	3.5	0.2	0.5	11.4	72.4	1.19	1.49	1.23
Thompson <i>et al.</i> 2002	LEL	-	-	-	-	-	-	-	-
	SEL	-	-	-	-	-	-	-	-
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-	-
Copper									
CCME 1999	TEL	36	1.8	2.1	161	2611	3.8	14.3	19.7
	PEL	197	0.34	0.38	29.1	473	0.69	2.59	3.56
Thompson <i>et al.</i> 2002	LEL	22	3.0	3.4	261	4236	6.2	23.2	31.9
	SEL	269	0.25	0.28	21.3	346	0.50	1.89	2.61
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-	-
Lead									
CCME 1999	TEL	35	2.9	3.8	11.1	30.0	7.8	7.8	7.9
	PEL	91	1.1	1.45	4.2	11.5	3.0	3.0	3.0
Thompson <i>et al.</i> 2002	LEL	37	2.7	3.6	10.5	28.4	7.3	7.4	7.5
	SEL	412	0.25	0.32	0.94	2.55	0.66	0.67	0.67
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-	-
Manganese^{c)}									
CCME 1999	TEL	460	0.62	0.59	152	1095	0.93	5.68	0.87
	PEL	1100	0.26	0.25	64	458	0.39	2.37	0.36
Thompson <i>et al.</i> 2002	LEL	-	-	-	-	-	-	-	-
	SEL	-	-	-	-	-	-	-	-
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-	-
Nickel									
CCME 1999	TEL	18	3.55	4.25	62.8	235	9.65	10.8	9.33
	PEL	36	1.78	2.13	31.5	118	4.84	5.40	4.68
Thompson <i>et al.</i> 2002	LEL	23	2.78	3.33	49.2	184	7.55	8.43	7.30
	SEL	484	0.13	0.16	2.34	8.72	0.36	0.40	0.35
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-	-
	LOEC	210	0.30	0.36	5.39	20.1	0.83	0.92	0.80
	IC ₂₅ ^{d)}	189	0.34	0.40	5.98	22.3	0.92	1.03	0.89
	IC ₅₀ ^{d)}	312	0.21	0.25	3.63	13.5	0.56	0.62	0.54
Zinc									
CCME 1999	TEL	123	0.88	5.8	739	4854	2.35	23.5	1.96
	PEL	315	0.34	2.27	289	1895	0.92	9.19	0.77
Thompson <i>et al.</i> 2002	LEL	-	-	-	-	-	-	-	-
	SEL	-	-	-	-	-	-	-	-
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-	-
Notes:									
^{a)} Sediment concentrations for upstream sites were derived from measured annual average water concentrations and Kd estimates.									
^{b)} Sediment concentrations for downstream sites were derived from predicted annual average water concentrations and Kd estimates.									
^{c)} Manganese sediment quality guidelines taken from MOE (1993) as they were not available from any other source.									
^{d)} IC ₂₅ and IC ₅₀ benchmarks are for growth effects.									

6.1.2.3 Anvil Creek

Table 6.1-11 provides a summary of the SI values for predicted sediment concentrations at the mouth of Anvil Creek. In the “Existing” scenario, SI values are greater than 1 for copper and manganese only; all other metals have sediment concentrations below the respective benchmarks. The SI values for the “No Intervention” scenario (Future 1 and Future 3) are seen to be much greater than 1 for all COPC, which suggests that there is an increased potential of adverse effects of benthic invertebrates in this scenario. By contrast, the SI values for the “Remediation” Future 2 scenario while above the “Existing” scenario, are similar to those predicted for the “Existing” scenario in Rose Creek and Vangorda Creek. As both of these systems have been shown to have diverse and rich benthic communities, it is concluded that the “Remediation” Future 2 scenario would not adversely affect these populations in the near term. In the “Remediation” Future 3 scenario however, the COPC concentrations in sediments are predicted to increase substantially resulting in higher SI values, particularly for zinc. Hence, it is concluded there is an increased possibility of adverse effects to benthic organisms exposed to zinc in the sediments; however, the extent of the adverse effects are unknown.

In the “Treat All Flows” scenario, SI values are still above the “Existing” scenario but are similar to those predicted for the “Existing” scenario in Rose Creek and Vangorda Creek. Biological studies on these two creeks have found no adverse effects on benthic communities indicating that there will probably be no adverse effects on benthic communities under this scenario in Anvil Creek. In addition, the study by the Selkirk First Nation indicates that benthic populations on Anvil Creek were low *“however the significant proportion of chemical sensitive organisms present is indicative of good water quality and substrate conditions”*.

6.1.2.4 Pelly River

In the Pelly River (Table 6.1-12), it can be seen that predicted sediment concentrations are above sediment quality benchmarks both in the “Existing” scenario and in the “No Intervention” scenario. However, in the “Remediation” and “Treat All Flows” scenarios, only sediment levels of cadmium, copper and lead exceed benchmarks. The predicted sediment concentrations are well below those currently measured in Rose Creek and Vangorda Creek. Benthic community surveys on these two watersheds and on Pelly River indicated that benthic communities are not experiencing adverse effects; therefore, it is unlikely that benthic communities in the Pelly River will under the future remediation scenarios experience any adverse effects.

TABLE 6.1-11
SEDIMENT SCREENING INDEX VALUES AT MOUTH OF ANVIL CREEK UNDER
DIFFERENT SCENARIOS CONSIDERED IN RISK ASSESSMENT

COPC, Source and Type of Sediment Toxicity Benchmark	Sediment Toxicity Benchmark (mg/kg)	Existing Scenario	Assessment Scenarios					
			"No Intervention"		"Remediation"		"Treat All Flows"	
			Future 1	Future 3	Future 2	Future 3	Future 3	Future 3
			Mouth of Anvil Creek	Mouth of Anvil Creek	Mouth of Anvil Creek	Mouth of Anvil Creek	Mouth of Anvil Creek	Mouth of Anvil Creek
		Anvil Creek D/S of Rose Creek	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average	Predicted Annual Average
		Measured (July 2004)						
Arsenic								
CCME 1999	TEL	5.9	0.6	9	130	2.0	4.0	1.93
	PEL	17	0.2	3.0	45.1	0.69	1.39	0.67
Thompson <i>et al.</i> 2002	LEL	10	0.4	5.1	76.8	1.2	2.4	1.14
	SEL	346	0.01	0.15	2.22	0.03	0.07	0.03
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-
	LOEC	39	0.09	1.3	19.7	0.30	0.61	0.29
	IC ₂₅ ^{d)}	174	0.02	0.29	4.41	0.07	0.14	0.07
	IC ₅₀ ^{d)}	342	0.01	0.15	2.24	0.03	0.07	0.03
Cadmium								
CCME 1999	TEL	0.6	0.09	13	119	2.3	4.3	2.3
	PEL	3.5	0.02	2.2	20.5	0.40	0.73	0.40
Thompson <i>et al.</i> 2002	LEL	-	-	-	-	-	-	-
	SEL	-	-	-	-	-	-	-
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-
Copper								
CCME 1999	TEL	36	1.4	132	1170	9.1	23.1	6.35
	PEL	197	0.3	24.0	212	1.6	4.2	1.15
Thompson <i>et al.</i> 2002	LEL	22	2.3	215	1899	15	38	10.3
	SEL	269	0.2	17.6	155	1.2	3.1	0.84
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-
Lead								
CCME 1999	TEL	35	0.4	2.5	8.6	2.7	2.7	2.7
	PEL	91	0.2	1.0	3.3	1.0	1.1	1.04
Thompson <i>et al.</i> 2002	LEL	37	0.4	2.4	8.1	2.5	2.6	2.6
	SEL	412	0.04	0.22	0.73	0.23	0.23	0.23
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-
Manganese^{e)}								
CCME 1999	TEL	460	1.2	7.5	107	1.23	2.84	1.13
	PEL	1100	0.5	3.1	44.7	0.51	1.19	0.47
Thompson <i>et al.</i> 2002	LEL	-	-	-	-	-	-	-
	SEL	-	-	-	-	-	-	-
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-
Nickel								
CCME 1999	TEL	18	0.85	3.81	26.8	2.42	2.78	2.45
	PEL	36	0.43	1.91	13.5	1.22	1.39	1.23
Thompson <i>et al.</i> 2002	LEL	23	0.67	2.99	21.0	1.90	2.18	1.92
	SEL	484	0.03	0.14	1.00	0.09	0.10	0.09
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-
	LOEC	210	0.07	0.33	2.30	0.21	0.24	0.21
	IC ₂₅ ^{d)}	189	0.08	0.36	2.56	0.23	0.26	0.23
	IC ₅₀ ^{d)}	312	0.05	0.22	1.55	0.14	0.16	0.14
Zinc								
CCME 1999	TEL	123	0.96	116	1214	4.5	26.1	1.76
	PEL	315	0.4	45	474	1.8	10.2	0.69
Thompson <i>et al.</i> 2002	LEL	-	-	-	-	-	-	-
	SEL	-	-	-	-	-	-	-
Liber and Sobey 2000	NOEC	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-
Notes:								
^{a)} Sediment concentrations for these sites were predicted from measured mean and annual average water concentrations and Kd estimates								
^{b)} Sediment concentrations for these sites were derived from predicted annual average water concentrations and Kd estimates.								
^{c)} Manganese sediment quality guidelines taken from MOE (1993) as they were not available from any other source.								
^{d)} IC ₂₅ and IC ₅₀ benchmarks are for growth effects.								

TABLE 6.1-12
SEDIMENT SCREENING INDEX VALUES IN PELLY RIVER AT PELLY CROSSING
UNDER DIFFERENT SCENARIOS CONSIDERED IN RISK ASSESSMENT

Contaminant, Source and Type of Sediment Toxicity Benchmark	Sediment Toxicity Benchmark (mg/kg)	"Existing" Scenario	Assessment Scenarios					
			"No Intervention"		"Remediation"		Treat All Flows	
			Future 1	Future 3	Future 2	Future 3	Future 3	
		Predicted Annual Average ^{a)}	Predicted Annual Average ^{b)}	Predicted Annual Average ^{b)}	Predicted Annual Average ^{b)}	Predicted Annual Average ^{b)}	Predicted Annual Average ^{b)}	
Arsenic								
CCME 1999	TEL	5.90	1.71	1.10	4.20	0.92	0.97	0.92
	PEL	17.00	0.59	0.38	1.46	0.32	0.34	0.32
Thompson <i>et al.</i> 2002	LEL	10	1.01	0.65	2.48	0.54	0.58	0.54
	SEL	346	0.03	0.02	0.07	0.02	0.02	0.02
Liber and Sobeý 2000	NOEC	-	-	-	-	-	-	-
	LOEC	39	0.26	0.17	0.64	0.14	0.15	0.14
	IC ₂₅ ^{d)}	174.0	0.06	0.04	0.14	0.03	0.03	0.03
	IC ₅₀ ^{d)}	342.0	0.03	0.02	0.07	0.02	0.02	0.02
Cadmium								
CCME 1999	TEL	0.60	1.19	2.69	5.91	2.32	2.37	2.32
	PEL	3.5	0.20	0.46	1.01	0.40	0.41	0.40
Thompson <i>et al.</i> 2002	LEL	-	-	-	-	-	-	-
	SEL	-	-	-	-	-	-	-
Liber and Sobeý 2000	NOEC	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-
Copper								
CCME 1999	TEL	36	4.60	10.4	40.5	7.02	7.40	6.97
	PEL	197	0.83	1.89	7.33	1.27	1.34	1.26
Thompson <i>et al.</i> 2002	LEL	22	7.46	16.9	65.7	11.4	12.0	11.3
	SEL	269	0.61	1.39	5.37	0.93	0.98	0.93
Liber and Sobeý 2000	NOEC	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-
Lead								
CCME 1999	TEL	35	0.80	3.6	3.8	3.6	3.6	3.6
	PEL	91	0.31	1.39	1.46	1.39	1.39	1.39
Thompson <i>et al.</i> 2002	LEL	37	0.76	3.4	3.6	3.4	3.4	3.4
	SEL	412	0.07	0.31	0.32	0.31	0.31	0.31
Liber and Sobeý 2000	NOEC	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-
Manganese ^{c)}								
CCME 1999	TEL	460	2.04	0.98	4.83	0.56	0.61	0.56
	PEL	1100	0.86	0.41	2.02	0.24	0.26	0.24
Thompson <i>et al.</i> 2002	LEL	-	-	-	-	-	-	-
	SEL	-	-	-	-	-	-	-
Liber and Sobeý 2000	NOEC	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-
Nickel								
CCME 1999	TEL	18	3.47	1.11	1.94	0.99	1.00	0.99
	PEL	36	1.74	0.56	0.97	0.50	0.50	0.50
Thompson <i>et al.</i> 2002	LEL	23	2.71	0.87	1.51	0.78	0.78	0.78
	SEL	484	0.13	0.04	0.07	0.04	0.04	0.04
Liber and Sobeý 2000	NOEC	-	-	-	-	-	-	-
	LOEC	210	0.30	0.10	0.17	0.09	0.09	0.09
	IC ₂₅ ^{d)}	189	0.33	0.11	0.18	0.09	0.10	0.09
	IC ₅₀ ^{d)}	312	0.20	0.06	0.11	0.06	0.06	0.06
Zinc								
CCME 1999	TEL	123	0.94	4.8	38.5	0.64	1.23	0.57
	PEL	315	0.37	1.86	15.0	0.25	0.48	0.22
Thompson <i>et al.</i> 2002	LEL	-	-	-	-	-	-	-
	SEL	-	-	-	-	-	-	-
Liber and Sobeý 2000	NOEC	-	-	-	-	-	-	-
	LOEC	-	-	-	-	-	-	-
	IC ₂₅ ^{d)}	-	-	-	-	-	-	-
	IC ₅₀ ^{d)}	-	-	-	-	-	-	-
Notes:								
^{a)} Sediment concentrations for upstream sites were derived from measured annual average water concentrations and Kd estimates								
^{b)} Sediment concentrations for downstream sites were derived from predicted annual average water concentrations and Kd estimates								
^{c)} Manganese sediment quality guidelines taken from MOE (1993) as they were not available from any other source.								
^{d)} IC ₂₅ and IC ₅₀ benchmarks are for growth effects.								

6.2 AQUATIC ECOLOGY

The risk characterization phase combines the information gathered in the exposure and hazard assessment phases and characterizes the potential for adverse ecological and human health effects. This section of the report evaluates the risks to aquatic species via comparison of exposure levels to toxicity reference values.

Potential toxic effects of contaminants can be measured at different levels of biological and ecological organization. In this study, ecological impacts of different contaminants of potential concern on valued ecosystem components (VECs) in the aquatic environment were characterized by the calculation of screening index values. Screening index values provide an integrated description of the potential hazard, the exposure (or dose) response relationship and the exposure evaluation (U.S. EPA 1992, AIHC 1992). A screening index (SI) is calculated by dividing the expected exposure or dose concentration by the selected benchmark toxicity concentration for each ecological receptor.

The aquatic receptors chosen for the assessment represent several trophic levels in typical creek and river ecosystems. The aquatic screening index values for all species were estimated for the assessment scenarios for the month of maximum predicted COPC concentrations in the receiving waters. Estimates of the monthly concentrations of the COPC in the receiving waters were developed by SRK for each remediation scenario and these values were used directly in the aquatic ecosystem risk assessment discussed below.

It should be noted that the screening index (SI) values reported in this section are not estimates of the probability of ecological impact. Rather, the index values are positively correlated with the potential of an effect, that is, higher index values imply greater potential of an effect. Different magnitudes of the screening index have been used in other studies to screen for the potential ecological effects. A screening index value of 1.0 has been used in some instances (e.g. Suter 1991). In other work, Cadwell *et al.* (1993) suggested an index value of 0.3, based upon a cautious approach designed to account for potential chronic toxicity and chemical synergism. In this study, an index value of 1.0 was used to examine the potential adverse effects of COPC as the assessment is based on the application of chronic effects concentration (EC₂₅ or EC₂₀) endpoints for the aquatic species. Another reason for selecting an SI value of 1.0 is that calculations of COPC in water incorporate background levels in addition to the source contributions and are based on the for the maximum month measured or predicted concentrations.

Aquatic SI values were calculated for each of Rose Creek, Vangorda Creek, Anvil Creek and Pelly River for the “Existing” scenario (using measured concentrations from the 2002 to 2004 period) and for each of the assessment (remediation) scenarios (using predicted maximum month

concentrations). For the Rose and Vangorda watersheds, SI values were also calculated for upstream locations. The results for Rose Creek, Vangorda Creek, Anvil Creek and Pelly River are provided in Tables 6.2-1, 6.2-2, 6.2-3 and 6.2-4, respectively.

6.2.1 Rose Creek

The results of the assessment of Rose Creek (Table 6.2-1) show that for the “Existing” scenario at downstream locations, benthic invertebrate exposure to lead, predatory and forage fish exposure to manganese, phytoplankton exposure to nickel and zooplankton exposure to cadmium and silver also result in SI values above one. It should be noted that the TRV for nickel is 5 times lower than the CCME guideline for aquatic life. There are more recent TRV values for growth inhibition in *Selenastrum* that are in the order of 32 µg/L indicating that there are unlikely to be phytoplankton related nickel issues in the “Existing” scenario. Zinc exposure for most aquatic receptors, with the exception of aquatic plants and forage fish, result in SI values above one under “Existing” conditions. This is not surprising since the maximum measured concentration of zinc downstream in Rose Creek is 75.8 µg/L.

Based on the fact that SI values are greater than 1 under the “Existing” scenario indicates that there may be potential adverse effects observed in Rose Creek; however, a weight-of-evidence approach considering the health of fish from the 2004 monitoring program (White Mountain Environmental Consulting 2004) indicated that... *“Utilization of Rose Creek by juvenile chinook salmon (jcs) during the 2004 open water season was well documented.”* The biological report indicated that around X14 there was *“a wide variety of habitats, including riffles, rapids, glide areas and deep corner and side pools. Arctic grayling and slimy sculpin were both abundant in the various habitats. Slimy sculpin were far more abundant in the area downstream of the tailings pond channel than above it. Arctic grayling adults were well dispersed through the pools throughout the reach. Jcs were common in the lower reaches of the man made diversion channel but were less common or absent in the vicinity of the tailings pond channel. Sub-adult burbot were captured occasionally.”* These study findings indicates that there does not seem to be adverse effects occurring on fish populations in Rose Creek.

Another line of evidence involves the determination of metal concentrations in fish. The biological report (White Mountain Environmental Consulting 2004) indicates that... *“Metal content in fish from this site were low. Zinc levels were the second lowest after Blind Creek for the Arctic grayling and the lowest found in slimy sculpin. The levels recorded are lower than those reported from 2002 (Gartner Lee, 2003).”* This observation suggests that the metal levels, especially zinc, in fish are declining even though the concentrations in Rose Creek are still elevated, providing evidence that the fish are not sequestering the metals and thus remain healthy.

For the “No Intervention” Future 3 scenario in the long term, the water quality is worse than for the “Existing” scenario and exposure to cadmium, copper and zinc in the water column result in SI values that are very much greater than one which again suggests potential adverse effects on aquatic receptors including fish. The extent of these adverse effects is not known. Additionally, in this case phytoplankton exposure to arsenic and nickel and predatory fish exposure to silver also result in SI values above one. For nickel, the predicted concentrations are very much greater than 32 µg/L indicating potential issues in phytoplankton in this scenario. Concentrations of all COPC are predicted to be higher in the Future 3 scenario than the Future 1 resulting in screening index values above one for most of the aquatic receptors.

In the “Remediation” Future 2 scenario, water column concentrations are improved over the “No Intervention” Future 1 scenario, but SI values still remain above one with respect to exposure of all receptors except aquatic plants. Arsenic, manganese and silver exposure are not expected to result in adverse effects. However, for copper and zinc, SI values are still above one and are also above the SI values in the “Existing” scenario, indicating the potential for adverse effects in the aquatic environment. In addition, zooplankton exposure to cadmium; and benthic invertebrate exposure to lead also result in SI values above 1. As discussed above, it is unlikely that there will be any issues from phytoplankton exposure to nickel. In the “Remediation” Future 3 scenario, slightly lower SI values are observed than in the “No Intervention” Future 1 scenario. Cadmium, copper, lead, nickel and zinc concentrations are potential issues in this scenario.

In the “Treat All Flows” scenario, lower SI values are observed compared to the other assessment scenarios. Screening index values are marginally above one for exposure of several aquatic receptors to copper and zinc. Benthic invertebrate exposure to lead and phytoplankton exposure to nickel are similar to “Existing” measured conditions but are still above baseline conditions. Since the concentrations and SI values are similar to or below the “Existing” conditions, it is unlikely that aquatic receptors will experience adverse effects under this scenario.

TABLE 6.2-1
AQUATIC SCREENING INDEX VALUES FOR ROSE CREEK UNDER DIFFERENT
SCENARIOS CONSIDERED IN THE ASSESSMENT

COPC and Aquatic Receptor	Aquatic Toxicity Benchmark (mg/L)	Rose Creek Baseline	"Existing" Scenario	Assessment Scenarios				
				"No Intervention"		"Remediation"		"Treat All Flows"
				Future 1	Future 3	Future 2	Future 3	Future 3
				Downstream at X2 and X14	Downstream at X2 and X14	Downstream at X2 and X14	Downstream at X2 and X14	Downstream at X2 and X14
		Upstream at R1, R6 and R7	Downstream at X2 and X14	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month
		Measured Mean	Measured Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month
Arsenic								
Aquatic Plants	0.32	0.002	0.014	0.12	2.24	0.01	0.07	0.010
Phytoplankton	0.025	0.03	0.17	1.57	28.6	0.14	0.87	0.13
Benthic Invertebrates	0.34	0.002	0.01	0.12	2.11	0.01	0.06	0.01
Zooplankton	0.79	0.001	0.01	0.05	0.91	0.00	0.03	0.004
Predatory Fish	0.14	0.01	0.03	0.28	5.11	0.03	0.15	0.02
Forage Fish	0.12	0.01	0.04	0.33	5.96	0.03	0.18	0.03
Cadmium								
Aquatic Plants	3	0.0001	0.0003	0.01	0.07	0.001	0.002	0.001
Phytoplankton	0.003	0.07	0.26	7.48	74.0	0.97	2.32	0.94
Benthic Invertebrates	0.12	0.002	0.01	0.19	1.85	0.02	0.06	0.02
Zooplankton	0.00075	0.260	1.03	29.9	296	3.86	9.27	3.76
Predatory Fish	0.002	0.10	0.39	11.2	111	1.45	3.48	1.41
Forage Fish	0.009	0.02	0.09	2.49	24.7	0.32	0.77	0.31
Copper								
Aquatic Plants	0.15	0.01	0.02	5.82	51.2	0.13	0.88	0.03
Phytoplankton	0.004	0.21	0.75	218	1921	4.8	33	1.19
Benthic Invertebrates	0.08	0.01	0.04	10.9	96.1	0.24	1.66	0.06
Zooplankton	0.0041	0.21	0.73	213	1875	4.7	32	1.16
Predatory Fish	0.004	0.21	0.75	218	1921	4.8	33	1.19
Forage Fish	0.0041	0.21	0.73	213	1875	4.7	32	1.16
Lead								
Aquatic Plants	182	0.00001	0.00007	0.0001	0.0004	0.0001	0.00	0.0001
Phytoplankton	0.63	0.002	0.02	0.02	0.12	0.02	0.02	0.02
Benthic Invertebrates	0.002	0.68	6.25	6.17	37.4	7.04	7.50	7.21
Zooplankton	0.02	0.07	0.63	0.62	3.74	0.70	0.75	0.72
Predatory Fish	0.028	0.05	0.45	0.44	2.67	0.50	0.54	0.51
Forage Fish	0.415	0.003	0.03	0.03	0.18	0.03	0.04	0.03
Manganese								
Aquatic Plants	15.5	0.002	0.14	0.10	1.53	0.00	0.04	0.002
Phytoplankton	46.4	0.001	0.05	0.03	0.51	0.00	0.01	0.001
Benthic Invertebrates	46	0.001	0.05	0.03	0.51	0.00	0.01	0.001
Zooplankton	2.35	0.01	0.95	0.63	10.1	0.02	0.29	0.01
Predatory Fish	0.73	0.04	3.05	2.03	32.4	0.08	0.93	0.04
Forage Fish	2.06	0.01	1.08	0.72	11.5	0.03	0.33	0.02
Nickel								
Aquatic Plants	0.22	0.004	0.04	0.12	1.10	0.06	0.08	0.06
Phytoplankton	0.005	0.19	1.75	5.40	48.4	2.83	3.48	2.83
Benthic Invertebrates	0.86	0.001	0.01	0.03	0.28	0.02	0.02	0.02
Zooplankton	0.056	0.02	0.16	0.48	4.32	0.25	0.31	0.25
Predatory Fish	0.078	0.01	0.11	0.35	3.10	0.18	0.22	0.18
Forage Fish	0.29	0.003	0.03	0.09	0.83	0.05	0.06	0.05
Silver								
Aquatic Plants	-	-	-	-	-	-	-	-
Phytoplankton	-	-	-	-	-	-	-	-
Benthic Invertebrates	-	-	-	-	-	-	-	-
Zooplankton	0.00058	0.17	1.22	2.55	17.29	0.22	0.43	0.17
Predatory Fish	0.00092	0.11	0.77	1.61	10.90	0.14	0.27	0.11
Forage Fish	0.0104	0.01	0.07	0.14	0.96	0.01	0.02	0.01
Zinc								
Aquatic Plants	10.8	0.002	0.01	1.45	15.2	0.04	0.46	0.004
Phytoplankton	0.034	0.75	2.23	462	4841	13.1	145	1.22
Benthic Invertebrates	0.059	0.43	1.29	266.2	2790	7.54	83.4	0.70
Zooplankton	0.04	0.64	1.90	393	4115	11.1	123	1.04
Predatory Fish	0.06	0.43	1.26	262	2743	7.4	82	0.69
Forage Fish	0.25	0.10	0.30	63	658	1.8	20	0.17

6.2.2 Vangorda Creek

The results of the assessment of Vangorda Creek (Table 6.2-2) show that for the “Existing” scenario for the downstream sites sampled under the “Existing” scenario, lead concentrations result in an SI above 1 for benthic invertebrates. A similar result was observed at upstream locations. In addition, zooplankton exposure to cadmium and exposure of most aquatic receptors with the exception of aquatic plants and forage fish, to zinc at the downstream location (V27) in Vangorda Creek result in SI values above one, indicating the potential for adverse effects in these aquatic receptors. As discussed previously (Section 6.2.1), it is unlikely that nickel concentrations in Vangorda Creek will result in any adverse effects in phytoplankton.

To further assess the potential of adverse effects in fish populations, a weight-of-evidence approach using biological evidence from a 2004 monitoring survey (White Mountain Environmental Consulting 2004) indicated that.... *“Vangorda Creek had extensive utilization by several fish species. Notably, juvenile chinook salmon were very abundant, sub-adult Arctic grayling were common, juvenile Arctic grayling were occasional, slimy sculpin adults were uncommon and a single adult round whitefish was recorded.”*

In addition the report also noted that.... *“Concentrations of metals in fish tissue were low for most metals other than zinc. Zinc levels in slimy sculpins were in the higher levels of concentrations recorded during this investigation, however are similar to the levels recorded during 1997, a level much lower than recorded during 1996 and 2002 (Gartner Lee 2003).”* In Vangorda Creek, as opposed to Rose Creek, it appears that zinc is sequestered in fish more than in Rose Creek. However, even though the zinc levels in fish in Vangorda Creek are the highest reported for this study, there still seems to be no adverse effects on fish populations under the “Existing” scenario.

For the “No Intervention” Future 1 scenario, the water quality is predicted to be considerably worse than currently measured. As a result, SI values for cadmium, copper, manganese and silver are also above one for fish and zooplankton. SI values are very high for zinc (i.e. >400 for several receptors), indicating the potential for adverse effects on all aquatic species. Cadmium exposure result in SI values above 1 for all aquatic species with the exception of aquatic plants and benthic invertebrates. For nickel, additional potential adverse effects may be observed in phytoplankton, zooplankton and fish (predators). In the Future 3 scenario, there are significant issues relating to zinc exposure as well as to all the other COPC with the exception of arsenic.

In the “Remediation” Future 2 scenario, water column concentrations are improved compared to both the “Existing” scenario and to the “No Intervention” Future 1 scenario. However, similar to Rose Creek, there are some residual issues relating to cadmium, lead and zinc. In the Future 3 scenario, higher concentrations of COPC are observed. However, cadmium, copper, lead and zinc are the only COPC with SI values that would indicate possible adverse effects.

TABLE 6.2-2
AQUATIC SCREENING INDEX VALUES FOR VANGORDA CREEK UNDER
DIFFERENT SCENARIOS CONSIDERED IN THE ASSESSMENT

COPC and Aquatic Receptor	Aquatic Toxicity Benchmark (mg/L)	Vangorda Creek Baseline	"Existing" Scenario	Assessment Scenarios				
				"No Intervention"		"Remediation"		"Treat All Flows"
				Future 1	Future 3	Future 2	Future 3	Future 3
				Downstream at V27	Downstream at V27	Downstream at V27	Downstream at V27	Downstream at V27
		Upstream at V1, V4 and V20	Downstream at V27	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month
Arsenic								
Aquatic Plants	0.32	0.009	0.03	0.05	0.05	0.014	0.014	0.013
Phytoplankton	0.025	0.12	0.39	0.70	0.70	0.18	0.18	0.17
Benthic Invertebrates	0.34	0.01	0.03	0.05	0.05	0.01	0.01	0.01
Zooplankton	0.79	0.004	0.01	0.02	0.02	0.01	0.01	0.005
Predatory Fish	0.14	0.02	0.07	0.12	0.12	0.03	0.03	0.03
Forage Fish	0.12	0.02	0.08	0.15	0.15	0.04	0.04	0.04
Cadmium								
Aquatic Plants	3	0.0001	0.0004	0.01	0.06	0.001	0.001	0.001
Phytoplankton	0.003	0.09	0.39	9.89	63.4	0.92	1.17	0.94
Benthic Invertebrates	0.12	0.002	0.01	0.25	1.58	0.02	0.03	0.02
Zooplankton	0.00075	0.37	1.56	39.6	254	3.67	4.70	3.77
Predatory Fish	0.002	0.14	0.58	14.8	95.1	1.37	1.76	1.42
Forage Fish	0.009	0.03	0.13	3.30	21.1	0.31	0.39	0.31
Copper								
Aquatic Plants	0.15	0.01	0.01	1.47	25.9	0.02	0.13	0.11
Phytoplankton	0.004	0.33	0.50	55.2	970	0.88	4.70	4.08
Benthic Invertebrates	0.08	0.02	0.03	2.76	48.5	0.04	0.23	0.20
Zooplankton	0.0041	0.32	0.49	53.9	946	0.86	4.58	3.98
Predatory Fish	0.004	0.33	0.50	55.2	970	0.88	4.70	4.08
Forage Fish	0.0041	0.32	0.49	53.9	946	0.86	4.58	3.98
Lead								
Aquatic Plants	182	0.00002	0.00003	0.0001	0.0004	0.0001	0.0001	0.0001
Phytoplankton	0.63	0.01	0.01	0.04	0.11	0.02	0.02	0.02
Benthic Invertebrates	0.002	1.69	2.33	11.5	34.6	7.36	7.5	7.56
Zooplankton	0.02	0.17	0.23	1.15	3.46	0.74	0.75	0.76
Predatory Fish	0.028	0.12	0.17	0.82	2.47	0.53	0.53	0.54
Forage Fish	0.415	0.01	0.01	0.06	0.17	0.04	0.04	0.04
Manganese								
Aquatic Plants	15.5	0.001	0.001	0.52	3.77	0.002	0.02	0.002
Phytoplankton	46.4	0.0003	0.0004	0.18	1.26	0.001	0.01	0.001
Benthic Invertebrates	46	0.0003	0.0004	0.18	1.27	0.001	0.01	0.001
Zooplankton	2.35	0.01	0.01	3.46	24.9	0.01	0.12	0.01
Predatory Fish	0.73	0.02	0.03	11.1	80.1	0.04	0.38	0.04
Forage Fish	2.06	0.01	0.01	3.95	28.4	0.01	0.14	0.01
Nickel								
Aquatic Plants	0.22	0.02	0.03	0.61	2.34	0.07	0.08	0.07
Phytoplankton	0.005	0.75	1.47	26.8	103	3.25	3.7	3.11
Benthic Invertebrates	0.86	0.004	0.01	0.16	0.60	0.02	0.02	0.02
Zooplankton	0.056	0.07	0.13	2.40	9.19	0.29	0.33	0.28
Predatory Fish	0.078	0.05	0.09	1.72	6.59	0.21	0.24	0.20
Forage Fish	0.29	0.01	0.03	0.46	1.77	0.06	0.06	0.05
Silver								
Aquatic Plants	-	-	-	-	-	-	-	-
Phytoplankton	-	-	-	-	-	-	-	-
Benthic Invertebrates	-	-	-	-	-	-	-	-
Zooplankton	0.00058	0.79	0.30	1.71	1.71	0.79	0.79	0.78
Predatory Fish	0.00092	0.50	0.19	1.08	1.08	0.50	0.50	0.49
Forage Fish	0.0104	0.04	0.02	0.10	0.10	0.04	0.04	0.04
Zinc								
Aquatic Plants	10.8	0.001	0.01	2.23	14.6	0.00	0.07	0.004
Phytoplankton	0.034	0.40	3.64	707	4647	1.54	21.4	1.18
Benthic Invertebrates	0.059	0.23	2.10	407.5	2678	0.89	12.3	0.68
Zooplankton	0.04	0.34	3.09	601	3950	1.31	18.2	1.00
Predatory Fish	0.06	0.23	2.06	401	2633	0.87	12.1	0.67
Forage Fish	0.25	0.05	0.49	96	632	0.21	2.9	0.16

In the “Treat All Flows” scenario, SI values are observed that are very similar to those under the “Remediation” Future 2 scenario. There are still some residual issues relating to cadmium, lead and zinc. However, under this scenario, it is unlikely that fish populations will experience adverse effects.

6.2.3 Anvil Creek

The results of the assessment for the mouth of Anvil Creek (Table 6.2-3) show that in the “Existing” scenario, there are no exceedances of the aquatic TRVs. In the “No Intervention” scenario, the SI values for copper and zinc for most aquatic species exceed a value of 1. Additionally, cadmium exposure results in SI values above 1 for phytoplankton, zooplankton and predator fish. Based on these high SI values, it is surmised that there is a potential for adverse effects at the mouth of Anvil Creek; however, the effects are unknown. As with the other watersheds, the long-term “No Intervention” scenario represents the worst water quality of all the scenarios considered. For the “Remediation” scenario, copper and zinc concentrations result in SI values above 1 for most aquatic receptors. The copper concentrations are over predicted as discussed earlier.

The SI values for the “Treat All Flows” scenario are much lower than those calculated for the “Existing” scenario for Rose Creek and Vangorda Creek. The biological evidence on these two watersheds indicates that there are healthy populations of fish; additionally, biological sampling on Anvil Creek indicate that the lower portions of Anvil Creek are very productive for juvenile Chinook salmon. Therefore it is unlikely that there will be adverse effects at the mouth of Anvil Creek under this scenario.

TABLE 6.2-3
AQUATIC SCREENING INDEX VALUES FOR ANVIL CREEK UNDER DIFFERENT
SCENARIOS CONSIDERED IN THE ASSESSMENT

COPC and Aquatic Receptor	Aquatic Toxicity Benchmark (mg/L)	"Existing" Scenario Anvil Creek D/S of Rose Creek Measured in July 2004	Assessment Scenarios				
			"No Intervention"		"Remediation"		"Treat All Flows"
			Future 1	Future 3	Future 2	Future 3	Future 3
			Mouth of Anvil Creek	Mouth of Anvil Creek	Mouth of Anvil Creek	Mouth of Anvil Creek	Mouth of Anvil Creek
			Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month
Arsenic							
Aquatic Plants	0.32	0.001	0.04	0.63	0.01	0.02	0.005
Phytoplankton	0.025	0.016	0.45	8.1	0.07	0.20	0.07
Benthic Invertebrates	0.34	0.001	0.03	0.59	0.01	0.01	0.005
Zooplankton	0.79	0.001	0.01	0.25	0.002	0.01	0.002
Predatory Fish	0.14	0.003	0.08	1.44	0.01	0.04	0.01
Forage Fish	0.12	0.003	0.09	1.68	0.01	0.04	0.01
Cadmium							
Aquatic Plants	3	0.00001	0.002	0.02	0.0003	0.0007	0.0003
Phytoplankton	0.003	0.007	2.14	20.8	0.33	0.67	0.33
Benthic Invertebrates	0.12	0.0002	0.05	0.52	0.01	0.02	0.008
Zooplankton	0.00075	0.027	8.58	83.2	1.31	2.70	1.30
Predatory Fish	0.002	0.010	3.22	31.2	0.49	1.01	0.49
Forage Fish	0.009	0.002	0.71	6.93	0.11	0.22	0.11
Copper							
Aquatic Plants	0.15	0.01	1.65	14.4	0.06	0.23	0.03
Phytoplankton	0.004	0.25	62	540	2.3	9	1.15
Benthic Invertebrates	0.08	0.01	3.1	27.0	0.11	0.44	0.06
Zooplankton	0.0041	0.24	60	526	2.2	9	1.12
Predatory Fish	0.004	0.25	62	540	2.3	9	1.15
Forage Fish	0.0041	0.24	60	526	2.2	9	1.12
Lead							
Aquatic Plants	182	0.000003	0.00003	0.0001	0.00003	0.00003	0.00003
Phytoplankton	0.63	0.001	0.01	0.04	0.01	0.01	0.01
Benthic Invertebrates	0.002	0.25	2.34	11.1	2.65	2.79	2.74
Zooplankton	0.02	0.03	0.23	1.11	0.27	0.28	0.27
Predatory Fish	0.028	0.02	0.17	0.79	0.19	0.20	0.20
Forage Fish	0.415	0.001	0.01	0.05	0.01	0.01	0.01
Manganese							
Aquatic Plants	15.5	0.002	0.03	0.43	0.00	0.01	0.002
Phytoplankton	46.4	0.0007	0.01	0.14	0.00	0.00	0.001
Benthic Invertebrates	46	0.0007	0.01	0.14	0.00	0.00	0.001
Zooplankton	2.35	0.01	0.19	2.8	0.02	0.06	0.01
Predatory Fish	0.73	0.04	0.60	9.1	0.05	0.19	0.04
Forage Fish	2.06	0.02	0.21	3.2	0.02	0.07	0.01
Nickel							
Aquatic Plants	0.22	0.004	0.04	0.31	0.02	0.03	0.02
Phytoplankton	0.005	0.18	1.67	13.7	0.98	1.17	0.99
Benthic Invertebrates	0.86	0.001	0.01	0.08	0.01	0.01	0.01
Zooplankton	0.056	0.02	0.15	1.23	0.09	0.10	0.09
Predatory Fish	0.078	0.01	0.11	0.88	0.06	0.07	0.06
Forage Fish	0.29	0.003	0.03	0.24	0.02	0.02	0.02
Silver							
Aquatic Plants	-	-	-	-	-	-	-
Phytoplankton	-	-	-	-	-	-	-
Benthic Invertebrates	-	-	-	-	-	-	-
Zooplankton	0.00058	0.34	0.84	4.97	0.19	0.24	0.17
Predatory Fish	0.00092	0.22	0.53	3.14	0.12	0.15	0.11
Forage Fish	0.0104	0.02	0.05	0.28	0.01	0.01	0.01
Zinc							
Aquatic Plants	10.8	0.001	0.41	4.3	0.01	0.09	0.003
Phytoplankton	0.034	0.44	130	1358	4.3	29	0.89
Benthic Invertebrates	0.059	0.25	75.0	783	2.50	16.9	0.51
Zooplankton	0.04	0.38	111	1154	3.7	25	0.76
Predatory Fish	0.06	0.25	74	770	2.5	17	0.51
Forage Fish	0.25	0.06	18	185	0.6	4	0.12

6.2.4 Pelly River

The results of the assessment of the Pelly River at Pelly Crossing (Table 6.2-4) show that for the downstream sites sampled under the “Existing” scenario, there are potential issues relating to phytoplankton, zooplankton and forage fish exposure to copper; zooplankton exposure to cadmium; benthic invertebrate exposure to lead, phytoplankton exposure to nickel and exposure of most aquatic receptors to zinc. As indicated in Section 6.2.1, it is unlikely that nickel concentrations would result in adverse effects in phytoplankton. However, the SI values are much lower than those calculated for the “Existing” scenario for Rose Creek and Vangorda Creek. The biological evidence on these two watersheds indicates that there are healthy populations of fish; as well biological sampling of fish on Pelly River indicate healthy fish populations. Therefore it is unlikely that there will be adverse effects in the Pelly River at Pelly Crossing.

For the “No Intervention” Future 1 scenario, water quality is marginally worse only for zinc. As with the other watersheds, the “No Intervention” Future 3 scenario represents the worst water quality of all the scenarios considered. SI values for copper and zinc are very much greater than one. Cadmium exposure in this scenario results in SI values above 1 for zooplankton and predator fish. The SI value for benthic invertebrates exposure to lead in the water column is similar to the other scenarios.

Water column concentrations and SI values are very similar under the “Remediation” scenarios as well as the “Treat All Flows” scenarios, and are lower than those under the “No Intervention” Future 1 scenario. Zinc exposure results in SI values above one for phytoplankton in the “Remediation” Future 3 scenario. However, it is unlikely that any adverse effects will be observed in aquatic populations under these scenarios.

TABLE 6.2-4
AQUATIC SCREENING INDEX VALUES FOR PELLY RIVER AT PELLY CROSSING
UNDER DIFFERENT SCENARIOS CONSIDERED IN THE ASSESSMENT

COPC and Aquatic Receptor	Aquatic Toxicity Benchmark (mg/L)	"Existing" Scenario	Assessment Scenarios				
			"No Intervention"		"Remediation"		"Treat All Flows"
			Future 1	Future 3	Future 2	Future 3	Future 3
		Measured Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month	Predicted Maximum Month
Arsenic							
Aquatic Plants	0.32	0.019	0.003	0.017	0.002	0.002	0.0019
Phytoplankton	0.025	0.24	0.03	0.22	0.02	0.03	0.02
Benthic Invertebrates	0.34	0.02	0.003	0.016	0.002	0.002	0.002
Zooplankton	0.79	0.01	0.001	0.007	0.001	0.001	0.001
Predatory Fish	0.14	0.04	0.01	0.04	0.004	0.00	0.004
Forage Fish	0.12	0.05	0.01	0.05	0.01	0.01	0.01
Cadmium							
Aquatic Plants	3	0.0005	0.0002	0.001	0.0002	0.0002	0.0002
Phytoplankton	0.003	0.50	0.23	0.78	0.17	0.18	0.17
Benthic Invertebrates	0.12	0.01	0.006	0.02	0.004	0.005	0.004
Zooplankton	0.00075	1.99	0.94	3.14	0.69	0.72	0.69
Predatory Fish	0.002	0.74	0.35	1.18	0.26	0.27	0.26
Forage Fish	0.009	0.17	0.08	0.26	0.06	0.06	0.06
Copper							
Aquatic Plants	0.15	0.11	0.08	0.43	0.03	0.04	0.03
Phytoplankton	0.004	3.94	2.86	16.2	1.27	1.44	1.24
Benthic Invertebrates	0.08	0.20	0.14	0.81	0.06	0.07	0.06
Zooplankton	0.0041	3.84	2.79	15.8	1.24	1.40	1.21
Predatory Fish	0.004	3.94	2.86	16.2	1.27	1.44	1.24
Forage Fish	0.0041	3.84	2.79	15.8	1.24	1.40	1.21
Lead							
Aquatic Plants	182	0.00004	0.00002	0.00003	0.00002	0.00002	0.00002
Phytoplankton	0.63	0.01	0.01	0.01	0.01	0.01	0.01
Benthic Invertebrates	0.002	3.27	2.15	2.40	2.15	2.15	2.15
Zooplankton	0.02	0.33	0.22	0.24	0.21	0.22	0.22
Predatory Fish	0.028	0.23	0.15	0.17	0.15	0.15	0.15
Forage Fish	0.415	0.02	0.01	0.01	0.01	0.01	0.01
Manganese							
Aquatic Plants	15.5	0.02	0.003	0.018	0.001	0.001	0.001
Phytoplankton	46.4	0.01	0.001	0.006	0.0003	0.000	0.0003
Benthic Invertebrates	46	0.01	0.001	0.006	0.0003	0.000	0.0003
Zooplankton	2.35	0.12	0.02	0.12	0.01	0.01	0.01
Predatory Fish	0.73	0.38	0.06	0.38	0.02	0.02	0.02
Forage Fish	2.06	0.14	0.02	0.14	0.01	0.01	0.01
Nickel							
Aquatic Plants	0.22	0.08	0.01	0.02	0.01	0.01	0.01
Phytoplankton	0.005	3.32	0.28	0.70	0.22	0.23	0.22
Benthic Invertebrates	0.86	0.02	0.002	0.004	0.001	0.001	0.001
Zooplankton	0.056	0.30	0.03	0.06	0.02	0.02	0.02
Predatory Fish	0.078	0.21	0.02	0.05	0.01	0.01	0.01
Forage Fish	0.29	0.06	0.005	0.012	0.004	0.004	0.004
Silver							
Aquatic Plants	-	-	-	-	-	-	-
Phytoplankton	-	-	-	-	-	-	-
Benthic Invertebrates	-	-	-	-	-	-	-
Zooplankton	0.00058	0.34	0.02	0.13	0.01	0.01	0.01
Predatory Fish	0.00092	0.22	0.01	0.08	0.00	0.01	0.005
Forage Fish	0.0104	0.02	0.001	0.007	0.000	0.001	0.0004
Zinc							
Aquatic Plants	10.8	0.01	0.02	0.13	0.001	0.00	0.001
Phytoplankton	0.034	2.26	4.85	41.7	0.35	1.03	0.27
Benthic Invertebrates	0.059	1.30	2.80	24.04	0.20	0.59	0.15
Zooplankton	0.04	1.92	4.12	35.5	0.30	0.87	0.23
Predatory Fish	0.06	1.28	2.75	23.6	0.20	0.58	0.15
Forage Fish	0.25	0.31	0.66	5.7	0.05	0.14	0.04

6.3 TERRESTRIAL ECOLOGY

This section presents the results of the risk characterization for terrestrial receptors assessed in the Anvil Range Mining Complex area. In the assessment of risks to the terrestrial valued ecosystem components, both aquatic and terrestrial exposure pathways for the contaminants of potential concern were taken into account. Hence, for all terrestrial VECs, the total dose estimates account for all major pathways of contaminant intake.

Potential toxic effects can be measured at different levels of biological and ecological organization. Screening indices provide an integrated description of the potential hazard, the exposure (or dose)-response relationship, and the exposure evaluation (U.S. EPA 1992, AIHC 1992). In this study, ecological impacts to contaminants of concern were characterized by the value of a simple screening index. This index was calculated by dividing the predicted exposure for the discharge scenarios by the benchmark toxicity value for each ecological receptor, as shown in equation (6.3-1).

$$\text{Screening Index} = \frac{\text{Dose}}{\text{Toxicity Benchmark}} \quad (6.3-1)$$

The screening index values reported in this section are not estimates of the probability of ecological impact. Rather, the index values are positively correlated with the potential of an effect, i.e. higher index values imply a greater potential of an effect. Different magnitudes of the screening index have been used in other studies to screen for potential ecological effects. A screening index value of 1.0 has been used in some instances (e.g. Suter 1991). In this study, screening index benchmark values of less than 1 are used to reflect the home range of the species as presented in Table 4.1-1. That is, index values were chosen based on the time that each species is assumed to spend at the site and the components of the species diet accounted for in the assessment. The SI benchmark values used in this assessment are presented on each of the tables discussed below. The potential ecological effects of COPC for the different scenarios considered were based on the 95th percentile upper confidence level of the mean concentrations.

6.3.1 “Existing” Scenario

The screening index values for the terrestrial animals in the study area under the “Existing” scenario are presented in Table 6.3-1. Any screening index values that exceed the corresponding SI benchmark values listed along the bottom row of the tables are shown in bold. For additional emphasis the cells are also shaded.

As seen from Table 6.3-1, the predicted intakes of COPC for the small terrestrial receptors such as hare, grouse and hoary marmot do not exceed their corresponding toxicity reference values; therefore, it is concluded that these receptors are not likely to experience adverse effects at any of the sites under the “Existing” scenario (i.e. under existing conditions). Larger species such as

Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

TABLE 6.3-1

PREDICTED SI VALUES FOR TERRESTRIAL ANIMALS UNDER “EXISTING” SCENARIO

Screening Indices (LOAEL)																			
	Caribou	Hare					Moose	Sheep	Grouse					Mallard					Pelly @ Crossing
	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	
Arsenic	0.05	0.03	0.10	0.04	0.21	0.12	0.03	0.01	<0.01	<0.01	<0.01	0.02	0.01	0.01	0.02	0.06	0.15	<0.01	0.03
Cadmium	<0.01	0.03	0.02	<0.01	0.03	0.03	0.02	<0.01	0.03	0.02	<0.01	0.02	0.03	0.01	0.01	0.02	0.07	0.02	0.03
Copper	0.01	0.03	0.04	0.03	0.06	0.04	0.01	0.02	<0.01	0.01	<0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Lead	0.04	<0.01	0.02	0.02	0.14	0.05	<0.01	<0.01	<0.01	0.08	0.14	0.69	0.25	<0.01	0.01	<0.01	0.02	<0.01	<0.01
Manganese	0.02	0.23	0.23	0.12	0.09	0.33	0.05	0.09	0.05	0.05	0.02	0.01	0.06	<0.01	0.04	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Thallium	0.03	0.01	0.02	0.02	0.06	0.01	<0.01	0.03	0.01	0.02	0.02	0.02	0.02	n/a	n/a	n/a	n/a	n/a	n/a
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	0.01	0.05	0.08	0.04	0.14	0.11	0.03	<0.01	0.21	0.16	0.16	0.58	0.45	0.11	0.09	0.05	0.32	0.02	0.07
SI Benchmark	0.5	1	1	1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5

Screening Indices (LOAEL)																	
	Merganser						Scaup						Hoary Marmot				
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Arsenic	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.02	0.03	0.12	0.27	0.01	0.05	0.01	0.07	0.01	0.10	0.06
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.02	0.07	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.02	0.02	0.03	0.02	0.02	0.03	0.04	0.03
Lead	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.02	0.04	0.03	0.06	0.03	0.02	<0.01	0.01	<0.01	0.08	0.03
Manganese	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.09	<0.01	<0.01	<0.01	0.01	0.16	0.15	0.16	0.11	0.30
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.01	0.01	0.01	0.12	<0.01
Tin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	0.05	0.04	0.02	0.15	<0.01	0.04	0.17	0.15	0.07	0.51	0.03	0.12	0.01	0.10	0.02	0.04	0.02
SI Benchmark	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1

Screening Indices (LOAEL)																			
	Bear			Wolf	Mink						Beaver						Fox		
	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Arsenic	<0.01	0.04	0.04	<0.01	0.07	0.09	0.35	0.79	0.04	0.15	<0.01	0.02	0.03	0.06	<0.01	0.02	<0.01	0.06	0.02
Cadmium	<0.01	<0.01	<0.01	<0.01	0.01	0.01	0.01	0.06	0.02	0.02	0.02	0.02	0.03	0.09	0.03	0.04	<0.01	<0.01	<0.01
Copper	0.01	0.02	0.02	<0.01	0.02	0.02	0.04	0.07	0.08	0.10	<0.01	<0.01	<0.01	0.01	0.01	0.02	<0.01	<0.01	<0.01
Lead	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Manganese	0.05	0.09	0.06	<0.01	0.02	0.24	<0.01	<0.01	<0.01	0.04	0.03	0.15	0.03	0.03	0.03	0.03	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	0.01	0.04	0.02	0.02	0.04	0.03	0.02	0.12	<0.01	0.03	0.01	0.02	0.01	0.03	<0.01	0.02	<0.01	0.03	0.01
SI Benchmark	1	1	1	0.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

bear, caribou, moose, sheep, wolf and fox are also not expected to experience adverse effects from exposure to COPC under "Existing" conditions at the Anvil Range Mine site.

Aquatic based mammals such as the beaver and mink are predicted to have intakes of the COPC below the TRV values and are not expected to experience any adverse effects. Similarly, ducks such as the mallard, merganser and scaup that are present on Rose Creek, Vangorda Creek and the Pelly River are not predicted to experience any adverse effects from exposure to COPC in the aquatic environment.

6.3.2 "No Intervention" Scenario

The screening index values for the COPC for the various receptors for the "No Intervention" Future 1 scenario are provided on Table 6.3-2. As seen from the table, the predicted intakes of COPC for the small terrestrial receptors such as hare, grouse and hoary marmot do not exceed their corresponding toxicity reference value; hence, it is concluded that these receptors would not experience any adverse effects at the site under the "No Intervention" scenario. Larger species such as bear, caribou, moose, sheep, and wolf are also not expected to experience adverse effects from exposure to COPC under the "No Intervention" scenario at the Anvil Range Mine site. However, fox exposure to zinc at the Vangorda mine site and at the Faro mine site is predicted to potentially result in total intakes above the corresponding TRV. The main contributor to the zinc exposure in the fox on Vangorda mine site is the consumption of ducks from Vangorda Creek downstream on mine site and for the fox on the Faro mine site from consumption of fish taken from Rose Creek downstream of the mine site.

Aquatic based mammals such as the beaver and mink are predicted to have intakes of the COPC above the TRV values for zinc in the downstream reaches of Vangorda Creek and Rose Creek (mink only). Fish is the major pathway of exposure for mink. Fish concentrations were derived from site-specific transfer factors. Additionally, mink exposure to arsenic (Rose Creek), copper (Rose Creek and Vangorda Creek) and manganese (Vangorda Creek) result in intakes above the respective TRVs. For arsenic, copper and manganese exposures, sediment consumption is the major pathway of exposure for mink.

Ducks such as the mallard, merganser and scaup on Rose Creek and Vangorda Creek are predicted to have intakes of zinc that could potentially result in adverse effects. The SI values for all COPC for these species are below the benchmark value of 0.5. Cadmium exposure for mallard and scaup exceed the SI benchmark value. Exposure of copper also results in SI values above 0.5 for scaup. Sediment consumption is the major pathway of exposure. As noted previously, copper concentrations are over predicted; therefore, the results for copper are overstated.

The predicted screening index values of the COPC in the "No Intervention" Future 3 scenario are provided on Table 6.3-3 for the various receptors. This scenario represents the "worst case" scenario.

Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

TABLE 6.3-2

PREDICTED SI VALUES FOR TERRESTRIAL ANIMALS UNDER “NO INTERVENTION” SCENARIO – FUTURE 1

Screening Indices (LOAEL)																			
	Caribou	Hare					Moose	Sheep	Grouse					Mallard					Pelly @ Crossing
	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	
Arsenic	0.05	0.03	0.10	0.05	0.21	0.12	0.04	0.01	<0.01	<0.01	<0.01	0.02	0.01	0.01	0.22	0.06	0.12	<0.01	<0.01
Cadmium	<0.01	0.03	0.02	<0.01	0.03	0.03	0.05	<0.01	0.03	0.02	<0.01	0.02	0.03	0.01	0.28	0.02	0.65	0.02	0.03
Copper	0.01	0.03	0.04	0.03	0.06	0.05	0.07	0.02	<0.01	0.01	<0.01	0.02	0.01	<0.01	0.34	<0.01	0.21	<0.01	0.01
Lead	0.04	<0.01	0.02	0.02	0.14	0.05	<0.01	<0.01	<0.01	0.08	0.14	0.69	0.25	<0.01	0.01	<0.01	0.03	<0.01	<0.01
Manganese	0.02	0.23	0.23	0.12	0.09	0.33	0.06	0.09	0.05	0.05	0.02	0.01	0.06	<0.01	0.03	<0.01	0.24	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01
Thallium	0.03	0.01	0.02	0.02	0.06	0.01	<0.01	0.03	0.01	0.02	0.02	0.02	0.02	n/a	n/a	n/a	n/a	n/a	n/a
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	0.01	0.05	0.08	0.04	0.14	0.11	0.11	<0.01	0.21	0.16	0.17	0.58	0.45	0.11	9.79	0.05	27.07	0.02	0.17
SI Benchmark	0.5	1	1	1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5

Screening Indices (LOAEL)																	
	Merganser						Scaup						Hoary Marmot				
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Arsenic	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	0.02	0.41	0.12	0.22	0.01	0.02	0.01	0.06	0.01	0.10	0.06
Cadmium	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	0.01	0.28	0.02	0.64	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	<0.01	0.28	<0.01	0.17	<0.01	0.01	<0.01	0.87	0.01	0.53	0.02	0.03	0.02	0.02	0.03	0.04	0.03
Lead	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	0.02	0.04	0.03	0.10	0.03	0.03	<0.01	0.01	<0.01	0.08	0.03
Manganese	<0.01	<0.01	<0.01	0.07	<0.01	<0.01	<0.01	0.05	<0.01	0.49	<0.01	<0.01	0.16	0.15	0.16	0.11	0.30
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.01	0.01	0.01	0.12	<0.01
Tin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	0.05	4.66	0.02	12.89	<0.01	0.08	0.17	15.75	0.07	43.54	0.03	0.28	0.01	0.11	0.02	0.05	0.03
SI Benchmark	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1

Screening Indices (LOAEL)																			
	Bear			Wolf	Mink					Beaver					Fox				
	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Arsenic	<0.01	0.04	0.06	<0.01	0.07	1.19	0.35	0.64	0.04	0.04	<0.01	0.10	0.03	0.05	<0.01	<0.01	<0.01	0.05	0.09
Cadmium	<0.01	<0.01	<0.01	<0.01	0.01	0.25	0.01	0.52	0.02	0.02	0.02	0.33	0.03	0.75	0.03	0.04	<0.01	0.06	0.10
Copper	0.02	0.11	0.18	<0.01	0.02	2.85	0.04	1.74	0.08	0.11	<0.01	0.36	<0.01	0.22	0.01	0.02	<0.01	0.03	0.04
Lead	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Manganese	0.05	0.14	0.06	<0.01	0.02	0.14	<0.01	1.31	<0.01	<0.01	0.03	0.13	0.03	0.22	0.03	0.03	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	0.03	0.83	0.32	0.07	0.04	3.61	0.02	9.99	<0.01	0.06	0.01	0.53	0.01	1.42	<0.01	0.02	<0.01	2.40	0.87
SI Benchmark	1	1	1	0.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

TABLE 6.3-3

PREDICTED SI VALUES FOR TERRESTRIAL ANIMALS UNDER “NO INTERVENTION” SCENARIO – FUTURE 3

Screening Indices (LOAEL)																			
	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S
Arsenic	0.05	0.03	0.10	0.07	0.24	0.15	0.19	0.01	<0.01	<0.01	<0.01	0.02	0.01	0.01	3.63	0.06	0.12	<0.01	0.03
Cadmium	<0.01	0.03	0.02	<0.01	0.03	0.03	0.32	<0.01	0.03	0.02	<0.01	0.02	0.03	0.01	3.95	0.02	4.13	0.02	0.06
Copper	0.01	0.03	0.05	0.05	0.07	0.06	0.82	0.02	<0.01	0.01	0.01	0.02	0.02	<0.01	4.17	<0.01	3.39	<0.01	0.05
Lead	0.04	<0.01	0.02	0.02	0.14	0.05	<0.01	<0.01	<0.01	0.08	0.14	0.69	0.25	<0.01	0.06	<0.01	0.08	<0.01	<0.01
Manganese	0.02	0.23	0.24	0.12	0.09	0.33	0.21	0.10	0.05	0.05	0.02	0.01	0.06	<0.01	0.54	<0.01	1.71	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	0.05	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.05	0.01	0.01	<0.01	<0.01
Thallium	0.03	0.01	0.02	0.02	0.06	0.01	<0.01	0.03	0.01	0.02	0.02	0.02	0.02	n/a	n/a	n/a	n/a	n/a	n/a
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	0.02	0.05	0.10	0.06	0.16	0.13	0.75	0.02	0.21	0.21	0.21	0.63	0.50	0.11	149.61	0.05	177.78	0.02	1.41
SI Benchmark	0.5	1	1	1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5

Screening Indices (LOAEL)																	
	Merganser						Scaup						Hoary Marmot				
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Arsenic	<0.01	0.28	<0.01	<0.01	<0.01	<0.01	0.02	6.68	0.12	0.22	0.01	0.06	0.01	0.06	0.04	0.12	0.09
Cadmium	<0.01	0.12	<0.01	0.13	<0.01	<0.01	0.01	3.88	0.02	4.06	0.02	0.06	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	<0.01	3.37	<0.01	2.74	<0.01	0.04	<0.01	10.61	0.01	8.63	0.02	0.13	0.02	0.03	0.04	0.05	0.04
Lead	<0.01	0.04	<0.01	0.05	<0.01	<0.01	0.02	0.22	0.03	0.26	0.03	0.03	<0.01	0.01	<0.01	0.08	0.03
Manganese	<0.01	0.16	<0.01	0.52	<0.01	<0.01	<0.01	1.10	<0.01	3.49	<0.01	0.02	0.16	0.16	0.17	0.11	0.30
Nickel	<0.01	0.01	<0.01	0.03	<0.01	<0.01	<0.01	0.06	<0.01	0.17	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	0.04	0.01	0.01	<0.01	<0.01	<0.01	0.05	0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.01	0.01	0.01	0.12	<0.01
Tin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	0.05	71.25	0.02	84.66	<0.01	0.67	0.17	240.61	0.07	285.92	0.03	2.27	0.01	0.13	0.04	0.06	0.04
SI Benchmark	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1

Screening Indices (LOAEL)																			
	Bear			Wolf	Mink					Beaver						Fox			
	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Arsenic	<0.01	0.04	0.42	<0.01	0.07	19.45	0.35	0.64	0.04	0.17	<0.01	1.47	0.03	0.05	<0.01	0.02	<0.01	0.05	1.33
Cadmium	<0.01	0.04	0.04	<0.01	0.01	3.47	0.01	3.53	0.02	0.05	0.02	4.51	0.03	4.72	0.03	0.08	<0.01	0.95	1.16
Copper	0.03	1.63	2.00	0.06	0.02	34.81	0.04	28.32	0.08	0.44	<0.01	4.39	<0.01	3.57	0.01	0.06	<0.01	0.38	0.46
Lead	<0.01	<0.01	0.04	<0.01	<0.01	0.03	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Manganese	0.05	0.48	0.18	<0.01	0.02	2.96	<0.01	9.39	<0.01	0.04	0.03	0.56	0.03	1.44	0.03	0.03	<0.01	0.03	0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	0.16	<0.01	<0.01	<0.01	0.01	<0.01	0.03	<0.01	<0.01	<0.01	0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	0.20	5.35	4.53	0.49	0.04	55.19	0.02	65.58	<0.01	0.52	0.01	7.83	0.01	9.29	<0.01	0.09	<0.01	15.75	13.25
SI Benchmark	1	1	1	0.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Under this scenario, the predicted intakes of COPC for small terrestrial receptors such as hare and hoary marmot and larger terrestrial mammals such as caribou, moose and sheep do not exceed their corresponding toxicity reference values. For all the other terrestrial receptors considered in the assessment, zinc exposures result in the TRVs being exceeded. Terrestrial receptors such as beaver, mink and ducks that derive a substantial portion of their diet from the aquatic environment are at most risk from exposures to arsenic, cadmium, copper, manganese and zinc. As indicated above, copper concentrations are over predicted and therefore the risks are overstated.

6.3.3 “Remediation” Scenario

The predicted screening index values of the COPC for the various receptors are provided on Table 6.3-4 for the “Remediation” Future 2 scenario.

As seen from Table 6.3-4, the predicted intakes of COPC for the small terrestrial receptors such as hare, grouse and hoary marmot do not exceed their corresponding toxicity reference value and therefore, these receptors are not expected to experience adverse effects at the site under the “Remediation” Future 2 scenario. Additionally, larger species such as bear, caribou, fox, moose, sheep, and wolf are also not expected to experience adverse effects from exposure to COPC at the Anvil Range Mine site.

Aquatic based mammals such as the beaver and mink are predicted to have intakes of the COPC below the TRV values and also are not likely to experience any adverse effects. In addition, ducks such as mallard, merganser and scaup that are present downstream on Rose Creek and Vangorda Creek are predicted to have exposures below the TRV.

The predicted screening index values of the COPC for the various receptors are provided on Table 6.3-5 for the “Remediation” Future 3 scenario. The results presented in Table 6.3-5 are similar to those predicted in the Future 2 scenario (Table 6.3-4) for the small terrestrial receptors such as hare, grouse and hoary marmot. The SI values for these receptors do not exceed the benchmark value of 0.5; hence, these receptors are not expected to experience adverse effects at the site. Larger species such as bear, caribou, moose, sheep and wolf are also not expected to experience adverse effects from exposure to COPC at the Anvil Range Mine site. However, fox around the Faro Mine site are predicted to have intakes of zinc that are above the TRV. The ingestion of ducks accounts for almost all of the exposure for fox at this site.

Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

TABLE 6.3-4
PREDICTED SI VALUES FOR TERRESTRIAL ANIMALS UNDER “REMEDIATION” SCENARIO – FUTURE 2

Screening Indices (LOAEL)																			
	Caribou	Hare					Moose	Sheep	Grouse					Mallard					Pelly @ Crossing
	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	
Arsenic	0.05	0.03	0.10	0.04	0.21	0.12	0.03	0.01	<0.01	<0.01	<0.01	0.02	0.01	0.01	0.02	0.06	0.05	<0.01	<0.01
Cadmium	<0.01	0.03	0.02	<0.01	0.03	0.03	0.02	<0.01	0.03	0.02	<0.01	0.02	0.03	0.01	0.04	0.02	0.07	0.02	0.02
Copper	0.01	0.03	0.04	0.03	0.06	0.04	0.01	0.02	<0.01	0.01	<0.01	0.02	0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Lead	0.04	<0.01	0.02	0.02	0.14	0.05	<0.01	<0.01	<0.01	0.08	0.14	0.69	0.25	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
Manganese	0.02	0.23	0.23	0.12	0.09	0.33	0.05	0.09	0.05	0.05	0.02	0.01	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Thallium	0.03	0.01	0.02	0.02	0.06	0.01	<0.01	0.03	0.01	0.02	0.02	0.02	0.02	n/a	n/a	n/a	n/a	n/a	n/a
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	0.01	0.05	0.08	0.04	0.14	0.11	0.02	<0.01	0.21	0.16	0.17	0.58	0.45	0.11	0.31	0.05	0.09	0.02	0.02
SI Benchmark	0.5	1	1	1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5

Screening Indices (LOAEL)																	
	Merganser						Scaup						Hoary Marmot				
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Arsenic	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.03	0.12	0.09	0.01	0.01	0.01	0.06	0.01	0.10	0.06
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.03	0.02	0.07	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.04	0.01	0.01	0.02	0.02	0.02	0.02	0.03	0.04	0.03
Lead	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.02	0.03	0.03	0.07	0.03	0.03	<0.01	0.01	<0.01	0.08	0.03
Manganese	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.16	0.15	0.16	0.11	0.30
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.01	0.01	0.01	0.12	<0.01
Tin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	0.05	0.15	0.02	0.04	<0.01	0.01	0.17	0.50	0.07	0.14	0.03	0.04	0.01	0.10	0.02	0.04	0.02
SI Benchmark	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1

Screening Indices (LOAEL)																			
	Bear			Wolf	Mink						Beaver						Fox		
	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Arsenic	<0.01	0.03	0.04	<0.01	0.07	0.10	0.35	0.25	0.04	0.04	<0.01	0.02	0.03	0.02	<0.01	<0.01	<0.01	0.02	
Cadmium	<0.01	<0.01	<0.01	<0.01	0.01	0.03	0.01	0.05	0.02	0.02	0.02	0.04	0.03	0.09	0.03	0.04	<0.01	<0.01	
Copper	0.01	0.02	0.02	<0.01	0.02	0.12	0.04	0.04	0.08	0.08	<0.01	0.02	<0.01	<0.01	0.01	0.01	<0.01	<0.01	
Lead	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	
Manganese	0.05	0.09	0.05	<0.01	0.02	0.01	<0.01	<0.01	<0.01	<0.01	0.03	0.11	0.03	0.03	0.03	0.03	<0.01	<0.01	
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Thallium	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
Zinc	0.01	0.03	0.03	0.02	0.04	0.12	0.02	0.03	<0.01	<0.01	0.01	0.03	0.01	0.02	<0.01	0.01	<0.01	0.03	
SI Benchmark	1	1	1	0.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	

Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

TABLE 6.3-5

PREDICTED SI VALUES FOR TERRESTRIAL ANIMALS UNDER “REMEDIATION” SCENARIO – FUTURE 3

Screening Indices (LOAEL)																			
	Caribou	Hare					Moose	Sheep	Grouse					Mallard					Pelly @ Crossing
		Overall	Bkgd	Van-S	Faro-N	Faro-S			Faro-W	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	
Arsenic	0.05	0.03	0.10	0.05	0.21	0.12	0.03	0.01	<0.01	<0.01	<0.01	0.02	0.01	0.01	0.09	0.06	0.05	<0.01	<0.01
Cadmium	<0.01	0.03	0.02	<0.01	0.03	0.03	0.02	<0.01	0.03	0.02	<0.01	0.02	0.03	0.01	0.13	0.02	0.09	0.02	0.02
Copper	0.01	0.03	0.04	0.03	0.06	0.04	0.02	0.02	<0.01	0.01	<0.01	0.02	0.01	<0.01	0.09	<0.01	0.02	<0.01	<0.01
Lead	0.04	<0.01	0.02	0.02	0.14	0.05	<0.01	<0.01	<0.01	0.08	0.14	0.69	0.25	<0.01	0.01	<0.01	0.02	<0.01	<0.01
Manganese	0.02	0.23	0.23	0.12	0.09	0.33	0.05	0.09	0.05	0.05	0.02	0.01	0.06	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Thallium	0.03	0.01	0.02	0.02	0.06	0.01	<0.01	0.03	0.01	0.02	0.02	0.02	0.02	n/a	n/a	n/a	n/a	n/a	n/a
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	0.01	0.05	0.08	0.04	0.14	0.11	0.03	<0.01	0.21	0.16	0.17	0.58	0.45	0.11	3.88	0.05	0.86	0.02	0.05
SI Benchmark	0.5	1	1	1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5

Screening Indices (LOAEL)																	
	Merganser						Scaup						Hoary Marmot				
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Arsenic	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.17	0.12	0.09	0.01	0.01	0.01	0.06	0.01	0.10	0.06
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.12	0.02	0.08	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	<0.01	0.07	<0.01	0.01	<0.01	<0.01	<0.01	0.23	0.01	0.05	0.02	0.02	0.02	0.02	0.03	0.04	0.03
Lead	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.02	0.04	0.03	0.07	0.03	0.03	<0.01	0.01	<0.01	0.08	0.03
Manganese	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	0.02	<0.01	<0.01	0.16	0.15	0.16	0.11	0.30
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.01	0.01	0.01	0.12	<0.01
Tin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	0.05	1.85	0.02	0.41	<0.01	0.02	0.17	6.24	0.07	1.39	0.03	0.07	0.01	0.10	0.02	0.04	0.02
SI Benchmark	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1

Screening Indices (LOAEL)																			
	Bear			Wolf	Mink						Beaver						Fox		
	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Arsenic	<0.01	0.03	0.05	<0.01	0.07	0.49	0.35	0.25	0.04	0.04	<0.01	0.05	0.03	0.02	<0.01	<0.01	<0.01	0.02	0.04
Cadmium	<0.01	<0.01	<0.01	<0.01	0.01	0.11	0.01	0.07	0.02	0.02	0.02	0.15	0.03	0.11	0.03	0.04	<0.01	<0.01	0.03
Copper	0.01	0.02	0.06	<0.01	0.02	0.76	0.04	0.15	0.08	0.08	<0.01	0.10	<0.01	0.02	0.01	0.01	<0.01	<0.01	0.01
Lead	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Manganese	0.05	0.09	0.05	<0.01	0.02	0.08	<0.01	0.05	<0.01	<0.01	0.03	0.12	0.03	0.03	0.03	0.03	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	0.01	0.06	0.13	0.02	0.04	1.43	0.02	0.32	<0.01	0.02	0.01	0.22	0.01	0.06	<0.01	0.01	<0.01	0.08	0.35
SI Benchmark	1	1	1	0.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Aquatic based mammals such as the beaver are still predicted to have intakes of the COPC below the TRV values and also are not likely to experience any adverse effects. However, mink exposure to zinc in the downstream section of Rose Creek results in intakes (and SI values) above the TRV. Fish is the major contributor for zinc exposure.

Ducks such as mallard, merganser and scaup that are present downstream on Rose Creek and Vangorda Creek are predicted to have exposures to zinc that could potentially result in adverse effects. The ingestion of benthic invertebrates is the main pathway of exposure for the mallard and scaup whereas fish is the main pathway of exposure for the merganser.

6.3.4 “Treat All Flows” Scenario

The predicted screening index values of the COPC for the various receptors are provided on Table 6.3-6 for the “Treat All Flows” scenario.

As seen from Table 6.3-6, the predicted intakes of COPC for all terrestrial receptors in this scenario do not exceed their corresponding toxicity reference values. Therefore, it is concluded that these receptors are unlikely to experience any adverse effects at the site under the “Treat All Flows” scenario.

Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

TABLE 6.3-6
PREDICTED SI VALUES FOR TERRESTRIAL ANIMALS UNDER “TREAT ALL FLOWS” SCENARIO

Screening Indices (LOAEL)																			
	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Arsenic	0.05	0.03	0.10	0.04	0.21	0.12	0.03	0.01	<0.01	<0.01	<0.01	0.02	0.01	0.01	0.02	0.06	0.05	<0.01	<0.01
Cadmium	<0.01	0.03	0.02	<0.01	0.03	0.03	0.02	<0.01	0.03	0.02	<0.01	0.02	0.03	0.01	0.03	0.02	0.07	0.02	0.02
Copper	0.01	0.03	0.04	0.03	0.06	0.04	0.01	0.02	<0.01	0.01	<0.01	0.02	0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01
Lead	0.04	<0.01	0.02	0.02	0.14	0.05	<0.01	<0.01	<0.01	0.08	0.14	0.69	0.25	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
Manganese	0.02	0.23	0.23	0.12	0.09	0.33	0.05	0.09	0.05	0.05	0.02	0.01	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Thallium	0.03	0.01	0.02	0.02	0.06	0.01	<0.01	0.03	0.01	0.02	0.02	0.02	0.02	n/a	n/a	n/a	n/a	n/a	n/a
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	n/a	n/a	n/a	n/a	n/a	n/a
Zinc	0.01	0.05	0.08	0.04	0.14	0.11	0.02	<0.01	0.21	0.16	0.16	0.58	0.45	0.11	0.07	0.05	0.07	0.02	0.02
SI Benchmark	0.5	1	1	1	1	1	1	1	1	1	1	1	1	0.5	0.5	0.5	0.5	0.5	0.5

Screening Indices (LOAEL)																			
	Merganser						Scaup						Hoary Marmot						
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W		
Arsenic	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.03	0.12	0.08	0.01	0.01	0.01	0.06	0.01	0.10	0.06		
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	0.03	0.02	0.07	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01		
Copper	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	0.02	0.01	0.07	0.02	0.02	0.02	0.02	0.03	0.04	0.03		
Lead	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.02	0.03	0.03	0.07	0.03	0.03	<0.01	0.01	<0.01	0.08	0.03		
Manganese	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.16	0.15	0.16	0.11	0.30		
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Silver	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Thallium	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	0.01	0.01	0.01	0.12	<0.01		
Tin	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	<0.01	<0.01	<0.01	<0.01	<0.01		
Zinc	0.05	0.03	0.02	0.03	<0.01	<0.01	0.17	0.11	0.07	0.12	0.03	0.03	0.01	0.10	0.02	0.04	0.02		
SI Benchmark	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1	1	1	1	1		

Screening Indices (LOAEL)																			
	Bear			Wolf	Mink					Beaver						Fox			
	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Arsenic	<0.01	0.03	0.04	<0.01	0.07	0.09	0.35	0.25	0.04	0.04	<0.01	0.02	0.03	0.02	<0.01	<0.01	<0.01	0.02	0.02
Cadmium	<0.01	<0.01	<0.01	<0.01	0.01	0.03	0.01	0.06	0.02	0.02	0.02	0.04	0.03	0.09	0.03	0.04	<0.01	<0.01	<0.01
Copper	0.01	0.02	0.02	<0.01	0.02	0.07	0.04	0.21	0.08	0.08	<0.01	0.01	<0.01	0.03	0.01	0.01	<0.01	<0.01	<0.01
Lead	<0.01	<0.01	0.04	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Manganese	0.05	0.09	0.05	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	0.03	0.11	0.03	0.03	0.03	0.03	<0.01	<0.01	<0.01
Nickel	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Tin	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	0.01	0.03	0.02	0.02	0.04	0.03	0.02	0.03	<0.01	<0.01	0.01	0.02	0.01	0.02	<0.01	0.01	<0.01	<0.01	<0.01
SI Benchmark	1	1	1	0.25	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

6.4 HUMAN HEALTH

Human Health risk characterization involves the integration of the information from the exposure assessment and the toxicity assessment.

Carcinogens

For carcinogenic contaminants, a risk is calculated by multiplying the estimated dose (in mg/(kg d)) by the appropriate slope factor (in (mg/(kg d))⁻¹). This is shown in equation (6.4-1). The estimate corresponds to an incremental risk of an individual developing cancer over a lifetime as a result of exposure. Risk is defined as follows:

$$Risk = (D_i \times SF_i) + (D_o \times SF_o) + (D_d \times SF_d) \quad (6.4-1)$$

where:

- D_i = Dose due to inhalation exposure (mg/(kg d));
- D_o = Dose due to oral (ingestion) exposure (mg/(kg d));
- D_d = Dose due to dermal exposure (mg/(kg d));
- SF_i = Slope Factor for inhalation exposure (mg/(kg d))⁻¹;
- SF_o = Slope Factor for oral exposure (mg/(kg d))⁻¹;
- SF_d = Slope Factor for dermal exposure (mg/(kg d))⁻¹ (assumed equal to SF_o).

The doses or intakes for the different pathways of exposure are presented in Chapter 4 and the slope factors used in this assessment are presented in Chapter 6. The calculated risk is then compared to acceptable benchmarks. In this assessment, a risk level of 1×10^{-5} (1 in 100,000) was used to assess carcinogenic effects. Health Canada considers this value to represent an “essentially negligible” risk. Risk levels for child receptors are generally not calculated since the exposure of a child is not sufficient for carcinogenic effects to be observed. In this case, a composite receptor is assessed. This composite receptor encompasses the exposure of a child being on the site for 10 years and the exposure of this child as an adult for another 60 years. In simple terms, the assessment considers that someone would visit the site throughout their lifetime from child to an adult.

Non-Carcinogens

For many non-carcinogenic effects, protective biological mechanisms must be overcome before an adverse effect is manifested from exposure to the contaminant. This is known as a “threshold” concept. A reference dose (RfD) is the value most often used in the evaluation of

non-carcinogenic effects. Reference doses are discussed in Chapter 5. For non-carcinogenic contaminants, the hazard quotient (HQ) is defined as follows:

$$HQ = \frac{D_i}{RfD_i} + \frac{D_o}{RfD_o} + \frac{D_d}{RfD_d} \quad (6.4-2)$$

where:

- D_i = Dose due to inhalation exposure (mg/(kg d));
- D_o = Dose due to oral (ingestion) exposure (mg/(kg d));
- D_d = Dose due to dermal exposure (mg/(kg d));
- RfD_i = Reference Dose for inhalation exposure (mg/(kg d));
- RfD_o = Reference Dose for oral exposure (mg/(kg d));
- RfD_d = Reference Dose for dermal exposure (mg/(kg d)) (assumed equal to RfD_o).

In risk assessments, 20% of the dose or a hazard quotient of 0.2 is generally used to assess acceptable exposure from each individual pathway. In this assessment, soil and dermal exposures as well as water intakes and traditional food consumption over the year were evaluated; only supermarket foods and some background exposures were not considered therefore, a hazard quotient of 0.5 was considered to be appropriate for use at this site.

As discussed in previous sections, two different time-frames were considered, the first was the existing conditions at the site and the second was after remediation had occurred at the site. In the first case, it was assumed that campers were located off site (Camper 1) and would trap small mammals and gather berries around the Faro site, individuals would also be present in the Swim Lakes area (Camper 2) but would hunt large animals on site and trap and gather berries off site. The time on site was assumed to be 1.5 months per year. After remediation, it was assumed that conditions at the site were improved such that campers would be present for a longer time (2.5 months per year). It was assumed that individuals would be present off site, but would trap and gather berries near the Vangorda site (Camper 3), campers would also stay on site near Rose Creek (Camper 4) and Vangorda Creek (Camper 5). Table 6.4-1 summarizes these assumptions.

6.4.1 Chronic (Non-carcinogenic) Effects

Estimated exposures for the human receptors were presented in Section 4.5. Estimated exposures were divided by the toxicity benchmarks (RfDs), presented in Section 5.4, to calculate the hazard quotients (HQ).

6.4.1.1 “Existing” Scenario

Table 6.4-2 summarizes the results for Camper 1 and Table 6.4-3 summarizes the results for Camper 2. **Bold** values indicate that the hazard quotient exceeds a value of 0.5 selected for this assessment.

TABLE 6.4-1
LOCATION OF THE VARIOUS DIETARY COMPONENTS FOR THE HUMAN RECEPTORS

Receptor	Drinking Water	Fish/Ducks	Large Mammals	Small Mammals	Sheep	Berries/Medicinal Plants	Soil	Time on Site (months)
“Existing” and “No Intervention” Scenarios								
Camper 1	Pelly River (Background)	Pelly River (Background)	Site Wide	Faro S	Sheep (Mt Mye Van)	Faro S/M/N/W	Faro W	1.5
Camper 2	Pelly River above Vangorda Creek	Pelly River above Vangorda Creek	Site Wide	Background	Sheep (Mt Mye Van)	Background	Background	1.5
“Remediation” and “Treat All Flows” Scenarios								
Camper 3	Pelly River (Background)	Pelly River (Background)	Site Wide	Van S	Sheep (Mt Mye Van)	Van S/M	Van M	1.5
Camper 4	Rose Creek downstream	Rose Creek downstream	Site Wide	Faro S	Sheep (Mt Mye Van)	Faro S/M/N/W	Faro S	1.5
Camper 5	Vangorda Creek downstream	Vangorda Creek downstream	Site Wide	Van S	Sheep (Mt Mye Van)	Van S/M	Van S	1.5

Note: Camper 1 is also evaluated in the “Remediation” and “Treat All Flows” scenarios for comparative purposes.
It has been assumed that fish/ducks and large and small mammals would be taken from the site and consumed over the course of a year.

TABLE 6.4-2
HAZARD QUOTIENT VALUES FOR CAMPER 1 FOR “EXISTING” SCENARIO

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.12	<0.001	0.12	0.091	<0.001	0.091	0.055	<0.001	0.056
Copper	0.16	<0.001	0.16	0.12	<0.001	0.12	0.074	<0.001	0.074
Lead	0.3	<0.001	0.31	0.13	<0.001	0.13	0.078	<0.001	0.078
Manganese	0.067	<0.001	0.067	0.051	<0.001	0.051	0.034	<0.001	0.034
Nickel	0.004	<0.001	0.004	0.003	<0.001	0.003	0.002	<0.001	0.002
Silver	0.055	<0.001	0.055	0.039	<0.001	0.039	0.025	<0.001	0.025
Thallium	0.051	n/a	0.051	0.037	n/a	0.037	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.38	<0.001	0.38	0.28	<0.001	0.28	0.17	<0.001	0.17

Note: Values in bold exceed a value of 0.5.

TABLE 6.4-3
HAZARD QUOTIENT VALUES FOR CAMPER 2 FOR “EXISTING” SCENARIO

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.11	<0.001	0.11	0.084	<0.001	0.084	0.052	<0.001	0.052
Copper	0.15	<0.001	0.15	0.11	<0.001	0.11	0.069	<0.001	0.069
Lead	0.046	<0.001	0.046	0.034	<0.001	0.034	0.022	<0.001	0.022
Manganese	0.019	<0.001	0.019	0.011	<0.001	0.012	0.011	<0.001	0.011
Nickel	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.053	<0.001	0.053	0.038	<0.001	0.038	0.024	<0.001	0.024
Thallium	0.05	n/a	0.05	0.036	n/a	0.036	0.024	n/a	0.024
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.37	<0.001	0.37	0.26	<0.001	0.26	0.16	<0.001	0.16

Note: Values in bold exceed a value of 0.5.

As seen from the tables above, none of the predicted hazard quotient values for Camper 1 and Camper 2 under the “Existing” scenario are above a value of 0.5. This indicates that under the assumptions for these two human receptors, any risks from hunting, trapping and gathering berries from the site are not a cause for concern.

“No Intervention” Scenario

The results for Camper 1 and Camper 2 under the “No Intervention” Future 1 scenario are presented in Table 6.4-4 and 6.4-5 respectively. As discussed previously, these campers were assumed to have the same activity patterns as campers in the “Existing” scenario. **Bold** values indicate that the hazard quotient exceeds a value of 0.5 selected for this assessment.

TABLE 6.4-4
HAZARD QUOTIENT VALUES FOR CAMPER 1 FOR “NO INTERVENTION”
SCENARIO – FUTURE 1

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.12	<0.001	0.12	0.091	<0.001	0.091	0.055	<0.001	0.055
Copper	0.17	<0.001	0.17	0.13	<0.001	0.13	0.078	<0.001	0.078
Lead	0.32	<0.001	0.32	0.14	<0.001	0.14	0.084	<0.001	0.085
Manganese	0.024	<0.001	0.024	0.016	<0.001	0.017	0.014	<0.001	0.014
Nickel	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.051	<0.001	0.051	0.036	<0.001	0.036	0.023	<0.001	0.023
Thallium	0.051	n/a	0.051	0.037	n/a	0.037	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.41	<0.001	0.41	0.3	<0.001	0.3	0.19	<0.001	0.19

Note: Values in bold exceed a value of 0.5.

TABLE 6.4-5
HAZARD QUOTIENT VALUES FOR CAMPER 2 FOR “NO INTERVENTION”
SCENARIO – FUTURE 1

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.11	<0.001	0.11	0.084	<0.001	0.084	0.052	<0.001	0.052
Copper	0.15	<0.001	0.15	0.11	<0.001	0.11	0.069	<0.001	0.069
Lead	0.046	<0.001	0.046	0.034	<0.001	0.034	0.022	<0.001	0.022
Manganese	0.019	<0.001	0.019	0.011	<0.001	0.012	0.011	<0.001	0.011
Nickel	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.053	<0.001	0.053	0.038	<0.001	0.038	0.024	<0.001	0.024
Thallium	0.05	n/a	0.05	0.036	n/a	0.036	0.024	n/a	0.024
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.37	<0.001	0.37	0.26	<0.001	0.26	0.17	<0.001	0.17

Note: Values in bold exceed a value of 0.5.

As seen in the above two tables, there are no hazard quotient exceeding a value of 0.5. This indicates that under the “No Intervention” Future 1 scenario in the near term, there are no unacceptable exposures.

The results for Camper 1 and Camper 2 under the “No Intervention” Future 3 scenario in the future are presented in Table 6.3-6 and 6.3-7 respectively. In this scenario, the maximum contaminant loadings are observed throughout the aquatic systems.

TABLE 6.4-6
HAZARD QUOTIENT VALUES FOR CAMPER 1 FOR “NO INTERVENTION”
SCENARIO – FUTURE 3

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.19	<0.001	0.19	0.15	<0.001	0.15	0.088	<0.001	0.088
Copper	0.33	<0.001	0.33	0.26	<0.001	0.26	0.15	<0.001	0.15
Lead	0.32	<0.001	0.32	0.14	<0.001	0.14	0.085	<0.001	0.085
Manganese	0.072	<0.001	0.073	0.055	<0.001	0.055	0.037	<0.001	0.037
Nickel	0.002	<0.001	0.002	0.001	<0.001	0.001	<0.001	<0.001	<0.001
Silver	0.052	<0.001	0.052	0.037	<0.001	0.037	0.023	<0.001	0.023
Thallium	0.051	n/a	0.051	0.037	n/a	0.037	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.77	<0.001	0.77	0.59	<0.001	0.59	0.35	<0.001	0.35

Note: Values in bold exceed a value of 0.5.

TABLE 6.4-7
HAZARD QUOTIENT VALUES FOR CAMPER 2 FOR “NO INTERVENTION”
SCENARIO – FUTURE 3

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.11	<0.001	0.11	0.084	<0.001	0.084	0.052	<0.001	0.052
Copper	0.15	<0.001	0.15	0.11	<0.001	0.11	0.069	<0.001	0.069
Lead	0.046	<0.001	0.046	0.034	<0.001	0.034	0.022	<0.001	0.022
Manganese	0.019	<0.001	0.019	0.011	<0.001	0.012	0.011	<0.001	0.011
Nickel	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.053	<0.001	0.053	0.038	<0.001	0.038	0.024	<0.001	0.024
Thallium	0.05	n/a	0.05	0.036	n/a	0.036	0.024	n/a	0.024
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.38	<0.001	0.38	0.27	<0.001	0.27	0.17	<0.001	0.17

Note: Values in bold exceed a value of 0.5.

As seen in the above two tables, the exposure to zinc under the “No Intervention” Future 3 scenario results in hazard quotients very much greater than those predicted in Future 2. Zinc exposure for Camper 1 toddlers and children result in a HQ value above 0.5. This indicates that under the “No Intervention” scenario in the “worst case”, there will be unacceptable exposures to zinc. In this case, consumption of moose hunted on site still accounts for a large portion of the exposure. The moose exposure is still dominated by consumption of aquatic vegetation and sediment in the Future 3 scenario.

6.4.1.2 “Remediation” Scenario

This scenario involves the assumption that the aquatic environment on site and the surroundings is remediated to an extent that people would come on site and camp for a period of 1.5 months. The terrestrial concentrations remain unchanged in this scenario as it is uncertain as to what the remedial plans are onsite. The results for the Future 2 scenario are shown for Camper 1 (present

on site just for trapping and gathering near the Faro site) on Table 6.4-8, Camper 3 (present on site just for trapping and gathering near the Vangorda site) on Table 6.4-9, Camper 4 (camping on site near Rose Creek downstream) on Table 6.4-10 and Camper 5 (camping on site near Vangorda Creek downstream) on Table 6.4-11. **Bold** values indicate that the hazard quotient exceeds a value of 0.5 selected for this assessment.

TABLE 6.4-8
HAZARD QUOTIENT VALUES FOR CAMPER 1 FOR “REMEDIATION” SCENARIO
– FUTURE 2

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.11	<0.001	0.11	0.085	<0.001	0.085	0.052	<0.001	0.052
Copper	0.15	<0.001	0.15	0.11	<0.001	0.11	0.069	<0.001	0.069
Lead	0.32	<0.001	0.32	0.14	<0.001	0.14	0.084	<0.001	0.085
Manganese	0.019	<0.001	0.019	0.012	<0.001	0.012	0.011	<0.001	0.011
Nickel	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.051	<0.001	0.051	0.036	<0.001	0.036	0.023	<0.001	0.023
Thallium	0.051	n/a	0.051	0.037	n/a	0.037	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.37	<0.001	0.37	0.26	<0.001	0.26	0.17	<0.001	0.17

Note: Values in bold exceed a value of 0.5.

TABLE 6.4-9
HAZARD QUOTIENT VALUES FOR CAMPER 3 FOR “REMEDIATION” SCENARIO
– FUTURE 2

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.11	<0.001	0.11	0.084	<0.001	0.084	0.051	<0.001	0.051
Copper	0.15	<0.001	0.15	0.11	<0.001	0.11	0.069	<0.001	0.069
Lead	0.083	<0.001	0.083	0.047	<0.001	0.047	0.029	<0.001	0.029
Manganese	0.02	<0.001	0.02	0.011	<0.001	0.012	0.011	<0.001	0.011
Nickel	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.051	<0.001	0.051	0.036	<0.001	0.036	0.023	<0.001	0.023
Thallium	0.051	n/a	0.051	0.036	n/a	0.036	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.37	<0.001	0.37	0.26	<0.001	0.26	0.17	<0.001	0.17

Note: Values in bold exceed a value of 0.5.

TABLE 6.4-10
HAZARD QUOTIENT VALUES FOR CAMPER 4 FOR “REMEDIATION” SCENARIO
– FUTURE 2

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.14	<0.001	0.14	0.11	<0.001	0.11	0.064	<0.001	0.065
Copper	0.18	<0.001	0.18	0.13	<0.001	0.13	0.079	<0.001	0.08
Lead	0.5	0.002	0.51	0.16	0.001	0.16	0.095	0.001	0.096
Manganese	0.03	<0.001	0.03	0.021	<0.001	0.021	0.017	<0.001	0.017
Nickel	0.002	<0.001	0.002	0.002	<0.001	0.002	0.001	<0.001	0.001
Silver	0.054	<0.001	0.054	0.038	<0.001	0.038	0.024	<0.001	0.024
Thallium	0.051	n/a	0.051	0.037	n/a	0.037	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.45	<0.001	0.45	0.33	<0.001	0.33	0.2	<0.001	0.2

Note: Values in bold exceed a value of 0.5.

TABLE 6.4-11
HAZARD QUOTIENT VALUES FOR CAMPER 5 FOR “REMEDIATION” SCENARIO
– FUTURE 2

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.21	<0.001	0.21	0.16	<0.001	0.16	0.098	<0.001	0.098
Copper	0.13	<0.001	0.14	0.098	<0.001	0.098	0.061	<0.001	0.061
Lead	0.14	<0.001	0.14	0.078	<0.001	0.078	0.048	<0.001	0.048
Manganese	0.025	<0.001	0.025	0.015	<0.001	0.015	0.013	<0.001	0.013
Nickel	0.005	<0.001	0.005	0.004	<0.001	0.004	0.002	<0.001	0.002
Silver	0.06	<0.001	0.06	0.044	<0.001	0.044	0.027	<0.001	0.027
Thallium	0.051	n/a	0.051	0.036	n/a	0.036	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.39	<0.001	0.39	0.28	<0.001	0.28	0.17	<0.001	0.17

Note: Values in bold exceed a value of 0.5.

As seen from the tables, lead exposures for Camper 4 toddlers marginally exceed a HQ value of 0.5. This is due to soil exposure.

The results for the Future 3 scenario are shown for Camper 1 (present on site just for trapping and gathering near the Faro site) on Table 6.4-12, Camper 3 (present on site just for trapping and gathering near the Vangorda site) on Table 6.4-13, Camper 4 (camping on site near Rose Creek downstream) on Table 6.4-14 and Camper 5 (camping on site near Vangorda Creek downstream) on Table 6.4-15. **Bold** values indicate that the hazard quotient exceeds a value of 0.5 selected for this assessment.

TABLE 6.4-12
HAZARD QUOTIENT VALUES FOR CAMPER 1 FOR “REMEDIATION” SCENARIO
– FUTURE 3

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.11	<0.001	0.12	0.085	<0.001	0.085	0.052	<0.001	0.052
Copper	0.16	<0.001	0.16	0.11	<0.001	0.11	0.07	<0.001	0.07
Lead	0.32	<0.001	0.32	0.14	<0.001	0.14	0.084	<0.001	0.085
Manganese	0.02	<0.001	0.02	0.013	<0.001	0.013	0.012	<0.001	0.012
Nickel	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.051	<0.001	0.051	0.036	<0.001	0.036	0.023	<0.001	0.023
Thallium	0.051	n/a	0.051	0.037	n/a	0.037	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.38	<0.001	0.38	0.27	<0.001	0.27	0.17	<0.001	0.17

Note: Values in bold exceed a value of 0.5.

TABLE 6.4-13
HAZARD QUOTIENT VALUES FOR CAMPER 3 FOR “REMEDIATION” SCENARIO
– FUTURE 3

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.11	<0.001	0.11	0.085	<0.001	0.085	0.052	<0.001	0.052
Copper	0.15	<0.001	0.15	0.11	<0.001	0.11	0.07	<0.001	0.07
Lead	0.083	<0.001	0.083	0.047	<0.001	0.047	0.029	<0.001	0.029
Manganese	0.02	<0.001	0.021	0.012	<0.001	0.012	0.011	<0.001	0.011
Nickel	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.051	<0.001	0.051	0.036	<0.001	0.036	0.023	<0.001	0.023
Thallium	0.051	n/a	0.051	0.036	n/a	0.036	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.37	<0.001	0.37	0.27	<0.001	0.27	0.17	<0.001	0.17

Note: Values in bold exceed a value of 0.5.

TABLE 6.4-14
HAZARD QUOTIENT VALUES FOR CAMPER 4 FOR “REMEDIATION” SCENARIO
– FUTURE 3

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.34	<0.001	0.34	0.27	<0.001	0.27	0.16	<0.001	0.16
Copper	0.5	<0.001	0.5	0.39	<0.001	0.39	0.23	<0.001	0.23
Lead	0.51	0.002	0.51	0.17	0.001	0.17	0.097	0.001	0.098
Manganese	0.13	<0.001	0.13	0.098	<0.001	0.098	0.062	<0.001	0.062
Nickel	0.003	<0.001	0.003	0.002	<0.001	0.002	0.001	<0.001	0.001
Silver	0.055	<0.001	0.055	0.039	<0.001	0.039	0.025	<0.001	0.025
Thallium	0.051	n/a	0.051	0.037	n/a	0.037	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	1.44	<0.001	1.44	1.13	<0.001	1.13	0.67	<0.001	0.67

Note: Values in bold exceed a value of 0.5.

TABLE 6.4-15
HAZARD QUOTIENT VALUES FOR CAMPER 5 FOR “REMEDIATION” SCENARIO
– FUTURE 3

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.25	<0.001	0.25	0.19	<0.001	0.19	0.12	<0.001	0.12
Copper	0.19	<0.001	0.19	0.14	<0.001	0.14	0.087	<0.001	0.087
Lead	0.14	<0.001	0.14	0.078	<0.001	0.078	0.048	<0.001	0.048
Manganese	0.084	<0.001	0.085	0.063	<0.001	0.063	0.041	<0.001	0.042
Nickel	0.006	<0.001	0.006	0.004	<0.001	0.004	0.003	<0.001	0.003
Silver	0.06	<0.001	0.06	0.044	<0.001	0.044	0.027	<0.001	0.027
Thallium	0.051	n/a	0.051	0.036	n/a	0.036	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.6	<0.001	0.6	0.45	<0.001	0.45	0.27	<0.001	0.27

Note: Values in bold exceed a value of 0.5.

As seen in the above tables, the SI values are higher than the previous scenario. Camper 4 is the most exposed. In this scenario, toddlers, children and adults have HQ values greater than 0.5 for zinc exposures. Copper and lead exposures are marginally above a HQ value of 0.5.

6.4.1.3 “Treat All Flows” Scenario

The results for the “Treat All Flows” scenario are shown for Camper 1 (present on site just for trapping and gathering near the Faro site) on Table 6.4-16, Camper 3 (present on site just for trapping and gathering near the Vangorda site) on Table 6.4-17, Camper 4 (camping on site near Rose Creek downstream) on Table 6.4-18 and Camper 5 (camping on site near Vangorda Creek downstream) on Table 6.4-19. **Bold** values indicate that the hazard quotient exceeds a value of 0.5 selected for this assessment.

TABLE 6.4-16
HAZARD QUOTIENT VALUES FOR CAMPER 1 FOR “TREAT ALL FLOWS”
SCENARIO

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.11	<0.001	0.11	0.085	<0.001	0.085	0.052	<0.001	0.052
Copper	0.15	<0.001	0.15	0.11	<0.001	0.11	0.069	<0.001	0.069
Lead	0.32	<0.001	0.32	0.14	<0.001	0.14	0.084	<0.001	0.085
Manganese	0.019	<0.001	0.019	0.012	<0.001	0.012	0.011	<0.001	0.011
Nickel	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.051	<0.001	0.051	0.036	<0.001	0.036	0.023	<0.001	0.023
Thallium	0.051	n/a	0.051	0.037	n/a	0.037	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.37	<0.001	0.37	0.26	<0.001	0.26	0.17	<0.001	0.17

Note: Values in bold exceed a value of 0.5.

TABLE 6.4-17
HAZARD QUOTIENT VALUES FOR CAMPER 3 FOR “TREAT ALL FLOWS”
SCENARIO

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.11	<0.001	0.11	0.084	<0.001	0.084	0.051	<0.001	0.051
Copper	0.15	<0.001	0.15	0.11	<0.001	0.11	0.069	<0.001	0.069
Lead	0.083	<0.001	0.083	0.047	<0.001	0.047	0.029	<0.001	0.029
Manganese	0.02	<0.001	0.02	0.011	<0.001	0.011	0.011	<0.001	0.011
Nickel	0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Silver	0.051	<0.001	0.051	0.036	<0.001	0.036	0.023	<0.001	0.023
Thallium	0.051	n/a	0.051	0.036	n/a	0.036	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.37	<0.001	0.37	0.26	<0.001	0.26	0.16	<0.001	0.16

Note: Values in bold exceed a value of 0.5.

TABLE 6.4-18
HAZARD QUOTIENT VALUES FOR CAMPER 4 FOR “TREAT ALL FLOWS”
SCENARIO

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.14	<0.001	0.14	0.1	<0.001	0.1	0.062	<0.001	0.062
Copper	0.15	<0.001	0.15	0.11	<0.001	0.11	0.067	<0.001	0.068
Lead	0.5	0.002	0.51	0.16	0.001	0.16	0.095	0.001	0.096
Manganese	0.026	<0.001	0.026	0.018	<0.001	0.018	0.015	<0.001	0.015
Nickel	0.002	<0.001	0.002	0.002	<0.001	0.002	0.001	<0.001	0.001
Silver	0.054	<0.001	0.054	0.038	<0.001	0.038	0.024	<0.001	0.024
Thallium	0.051	n/a	0.051	0.037	n/a	0.037	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.38	<0.001	0.38	0.27	<0.001	0.27	0.17	<0.001	0.17

Note: Values in bold exceed a value of 0.5.

TABLE 6.4-19
HAZARD QUOTIENT VALUES FOR CAMPER 5 FOR “TREAT ALL FLOWS”
SCENARIO

COPC	Toddler			Child			Adult		
	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall	Ingestion	Dermal	Overall
Arsenic	-	-	-	-	-	-	-	-	-
Cadmium	0.22	<0.001	0.22	0.17	<0.001	0.17	0.1	<0.001	0.1
Copper	0.22	<0.001	0.22	0.17	<0.001	0.17	0.1	<0.001	0.1
Lead	0.14	<0.001	0.14	0.079	<0.001	0.079	0.049	<0.001	0.049
Manganese	0.024	<0.001	0.024	0.014	<0.001	0.015	0.013	<0.001	0.013
Nickel	0.005	<0.001	0.005	0.004	<0.001	0.004	0.002	<0.001	0.002
Silver	0.06	<0.001	0.06	0.044	<0.001	0.044	0.027	<0.001	0.027
Thallium	0.051	n/a	0.051	0.036	n/a	0.036	0.025	n/a	0.025
Tin	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	0.38	<0.001	0.38	0.27	<0.001	0.27	0.17	<0.001	0.17

Note: Values in bold exceed a value of 0.5.

As seen in the above tables, exposures for Camper 4 toddler marginally exceeds a HQ value of 0.5, all other campers present at the Anvil Mine Complex for 1.5 months do not result in an unacceptable risk. Soil exposure to lead is the major pathway of exposure.

6.4.2 Carcinogenic Effects

Table 6.4-20 shows the risk levels calculated for the composite receptor for all the scenarios considered in the assessment. A composite person is used to capture the exposure from being resident in the local area over a lifetime (70 years of exposure) spanning the persons childhood and adult years. The use of the composite receptor provides a cautious estimate of the risk due to arsenic exposure as it considers that individuals go to the site from childhood through adulthood.

There is some debate on the appropriate slope factor to be used to evaluate arsenic risks. Under the FCSAP program Health Canada advocates the use of the $2.8 \text{ (mg/(kg d))}^{-1}$ slope factor which corresponds to the development of skin cancer; however, the drinking water section of Health Canada have recently proposed a slope factor of $1.2 \text{ (mg/(kg d))}^{-1}$ corresponding to the development of internal cancers. Since all the recent data surrounding the development of cancer from arsenic was reviewed in the development of the slope factor of $1.2 \text{ (mg/(kg d))}^{-1}$, this appears to be the more appropriate value to use; however, in recognition of the FCSAP program, risks related to arsenic exposure were calculated using both values (see Table 6.4-20).

TABLE 6.4-20
INCREMENTAL LIFETIME RISKS OF CARCINOGENIC EFFECTS FOR ARSENIC
EXPOSURE FOR ALL SCENARIOS CONSIDERED IN THE ASSESSMENT

Receptors	Incremental Composite Risk for Arsenic	
	(SF=1.2)	(SF=2.8)
Existing Scenario		
Camper 1	3.4×10^{-5}	8.0×10^{-5}
Camper 2	0	0
No Intervention Future 1 Scenario		
Camper 1	4.9×10^{-6}	1.1×10^{-5}
Camper 2	0	0
No Intervention Future 3 Scenario		
Camper 1	3.9×10^{-5}	9.1×10^{-5}
Camper 2	0	0
Remediation Future 2 Scenario		
Camper 1	2.9×10^{-6}	6.8×10^{-6}
Camper 3	1.4×10^{-6}	3.2×10^{-6}
Camper 4	1.9×10^{-5}	4.5×10^{-5}
Camper 5	5.9×10^{-5}	1.4×10^{-4}
Remediation Future 3 Scenario		
Camper 1	3.5×10^{-6}	8.1×10^{-6}
Camper 3	1.9×10^{-6}	4.5×10^{-6}
Camper 4	1.3×10^{-4}	2.9×10^{-4}
Camper 5	5.9×10^{-5}	1.4×10^{-4}
Treat All Flows		
Camper 1	2.9×10^{-6}	6.7×10^{-6}
Camper 3	1.3×10^{-6}	3.1×10^{-6}
Camper 4	1.7×10^{-5}	4.0×10^{-5}
Camper 5	5.8×10^{-5}	1.4×10^{-5}

Note: Values in bold are above the Health Canada “essentially negligible” risk level of 1×10^{-5} .

As seen in the above table, under existing conditions, the risk levels for Camper 1 is above a risk level of 1×10^{-5} . Fish exposure dominates the exposure. It has been assumed in this scenario that fish are caught in the Pelly River and are taken off site and consumed over the year. This may result in an over estimate of exposure. There are no incremental risks for Camper 2 since they are present at a background location. The “No Intervention” Future 1 for Camper 1 does not result in any unacceptable risks; this is because the fish exposure pathway decreases and the moose exposure increases; however, in the Future 3 scenario where therefore maximum contaminant loads, incremental risk levels exceed the “essentially negligible” risk level of 1×10^{-5} .

In the “Remediation” Future 1 and Future 3 scenarios, the incremental risks for Camper 1 and 3 (who only gather berries and trap on site) are below the “essentially negligible” level of 1×10^{-5} . However, incremental risks for Campers 4 and 5 are above this “essentially negligible” risk levels.

The “Treat All Flows” scenario results in incremental risks that are similar to the “Remediation” scenarios.

The results of the human health assessment indicate that under the current land use at the Anvil Range Mine Complex, there are no unacceptable risks for human exposure.

6.5 UNCERTAINTY

Many areas of uncertainty attend a risk assessment. This is due to the fact that assumptions have to be made throughout the assessment either due to data gaps, environmental fate complexities or in the generalization of receptor characteristics. To be able to place a level of confidence in the results, an accounting of the uncertainty, the magnitude and type of which are important in determining the significance of the results, must be completed. In recognition of these uncertainties, some conservative assumptions are used throughout the assessment to ensure that the potential for an adverse effect would not be underestimated. Several of the major assumptions are outlined below.

The measured metal concentrations used in the assessment were based on data on the aquatic and terrestrial environments provided by Gartner Lee Limited. Site-specific transfer factors were developed from these data and applied to the “No Intervention”, “Remediation” and “Treat All Flows” scenarios. There is some uncertainty involved in the use of these transfer factors to predict future concentrations in environmental media. The predicted concentrations for the remediation scenarios were provided by SRK Consulting. As discussed previously, copper concentrations have been over predicted.

Toxicity values for the chemicals of concern are obtained from reputable sources (e.g., Health Canada, U.S. DOE and U.S. EPA); however, some assumptions are made in the absence of available data. For aquatic species, toxicity data for indicator species that were most similar to the receptor species were used. Given that no adequate toxicological database is available that determines the concentrations of chemicals that impact all terrestrial ecological species, toxicity data from laboratory species such as rats and mice were used and scaled to the appropriate terrestrial receptor. Additionally, for terrestrial mammals and birds, toxicity information for a chemical was used regardless of its form in the test procedure, even though this may not be the same form used in the assessment (e.g., an oxide form compared to a more soluble form). It is hard to determine the effect of these assumptions.

Another area of uncertainty is the use of a single value for toxicity. The slope factor is selected to be very protective. The slope factor for arsenic used in the human health assessment represent risks from upper bound (95th percentile) dose-response estimates. The reference doses represent an exposure day-after-day for a lifetime. The use of an upper bound for the toxicity values ensures that the risk to humans is not underestimated.

It is currently not possible or practical to develop approaches to evaluate the validity of the toxicity benchmark assumptions on the overall assessment. As improvements occur in toxicological/human health research and assessments, the uncertainties may be reduced. However, given that the predicted impacts are not significant, it is not anticipated that these improvements would change the overall conclusions of the assessment.

The characteristics (food, water and soil consumption) of ecological receptors were obtained from the literature. These values are generally obtained from animals in captivity and may not be fully representative of free-range animals in the wild. An underestimate of exposure might result from this but there are other conservative assumptions that may compensate (e.g. time spent in area exposed to the highest level of contamination).

Another area of uncertainty in the risk assessment is the effect of multiple contaminants. When dealing with toxic chemicals, there is potential interaction with other chemicals that may be found at the same location. It is well established that synergism, potentiation, antagonism or additivity of toxic effects occurs in the environment. A quantitative assessment of these interactions is outside the scope of this study and, in any event, would be constrained, as there is not an adequate base of toxicological evidence to quantify these interactions. This may result in an underestimate of the risk for some contaminants.

The amount of Labrador tea (leaves and stems) used to brew medicinal tea and the amount of tea consumed was assumed as the Yukon dietary survey (Receveur *et al.* 1998) did not provide this information. This leads to uncertainty in the assessment. As the consumption of Labrador tea only represented a small fraction (< 1%) of the intake for most of the COPC it is unlikely that the uncertainty in the consumption of Labrador tea would change the results of the assessment.

In the risk assessment it has been assumed that humans only consume animal flesh (i.e. caribou, moose sheep, beaver marmot, hare etc.) flesh (i.e. muscle). A sensitivity analysis was carried out to determine the effect of consumption of moose and caribou organs on the intakes of COPC under the “Existing” Scenario for Camper 1 who is the most exposed in this scenario. The Yukon dietary survey (Receveur *et al.* 1998) indicates that less than 1% of the population consume sheep livers or brains, about 5 % of the population consumes caribou liver or kidneys 0.2 to 0.3 days a week and 25 % of the population consumes moose liver and kidneys 0.3 to 0.4 days per week. Therefore, since the consumption of sheep organs by the population is very

low, the sensitivity analysis involved the evaluation of the consumption of caribou and moose organs. It has been assumed that only adults consume the organs.

There is little information provided on how much organ meat an individual may consume. From the dietary survey, it was reported that 1 individual consumed 112g of moose liver. This is about ½ a moose meat portion and about the same portion of someone consuming dry moose meat. Therefore, for the purposes of the sensitivity analysis, it was assumed that people would consume about 112 g of liver or kidneys at a sitting. Using the maximum measured concentrations of COPC provided in Table 2.3-6 results in the following intakes of COPC as presented in Table 6.5-1. In the assessment it is assumed that individuals consume both 112 g/d moose organ meat 0.35 days per week and caribou organ meat 0.25 days per week over the course of a year. This is a conservative assumption as it is unlikely that individuals would consume both moose and caribou organs during the same week. The table also provides a comparison with the predicted intakes from the other dietary pathways.

TABLE 6.5-1
SUMMARY OF INTAKES OF COPC CONSIDERING CARIBOU AND MOOSE
ORGANS FOR CAMPER 1 – EXISTING SCENARIO

COPC	COPC Intake (mg/(kg-d))			Total COPC Intake from Organs Ingestion	Total COPC Intake from Other Dietary Pathways
	Moose Liver	Moose Kidney	Caribou Liver		
Arsenic	1.05×10^{-7}	2.65×10^{-7}	2.74×10^{-7}	6.43×10^{-7}	3.45×10^{-5}
Cadmium	2.15×10^{-4}	1.61×10^{-3}	6.01×10^{-5}	1.88×10^{-3}	4.44×10^{-5}
Copper	8.60×10^{-4}	1.58×10^{-4}	6.24×10^{-4}	1.64×10^{-3}	2.23×10^{-3}
Lead	1.26×10^{-6}	1.24×10^{-6}	2.17×10^{-5}	2.42×10^{-5}	2.79×10^{-4}
Manganese	9.59×10^{-5}	1.16×10^{-4}	1.30×10^{-4}	3.42×10^{-4}	4.78×10^{-3}
Nickel	1.62×10^{-6}	8.40×10^{-6}	1.42×10^{-6}	1.14×10^{-5}	8.63×10^{-5}
Silver	3.35×10^{-6}	1.06×10^{-6}	2.85×10^{-5}	3.29×10^{-5}	1.23×10^{-4}
Thallium	1.05×10^{-7}	9.59×10^{-8}	4.57×10^{-8}	2.46×10^{-7}	2.00×10^{-6}
Tin	3.59×10^{-7}	4.79×10^{-8}	4.57×10^{-8}	4.53×10^{-7}	4.51×10^{-6}
Zinc	1.01×10^{-3}	1.22×10^{-3}	6.29×10^{-4}	2.87×10^{-3}	9.79×10^{-2}

As seen from the table, if it is conservatively assumed that individuals consume moose kidneys and livers and caribou livers at the rates provided above, the intakes from organs are lower than the intakes from the other dietary pathways considered in the assessment with the exception of cadmium. For cadmium, the maximum measured kidney concentration of 38 mg/kg ww results in an intake above that of other dietary pathways. It is known that cadmium accumulates in the liver and kidneys so that it is not unusual that high levels of cadmium would be found in the

kidneys of moose. The levels found in the 3 moose samples from the Anvil site are within the range of values reported in the dietary survey (Receveur *et al.* 1998) of approximately 20 mg/kg ww. Therefore, consumption of moose kidneys should only occur on an occasional basis.

As seen from Table 6.5-2, the contribution from the organs to the total intake from other dietary pathways are between 1% and 12 % for arsenic, lead, nickel, thallium, tin and zinc. For silver, the intakes of organs account for about 20% of the intake and this is mainly due to the consumption of caribou liver. Copper concentrations in organs account for about 40% of the intake and are mainly due to the consumption of caribou and moose livers. Cadmium intakes from organs account for about 98% of the intake from other dietary pathways.

TABLE 6.5-2
SUMMARY OF PERCENTAGE INTAKES OF COPC FOR ORGAN CONSUMPTION
FOR CAMPER 1 – EXISTING SCENARIO

COPC	% of Total COPC Intake			Total Percentage Intake from Organ Ingestion	Total Percentage Intake from Other Dietary Pathways
	Moose Liver	Moose Kidney	Caribou Liver		
Arsenic	0.3%	0.7%	0.8%	1.8%	97.6%
Cadmium	11.2%	83.4%	3.1%	97.7%	2.3%
Copper	22.2%	4.1%	16.1%	42.4%	57.6%
Lead	0.4%	0.4%	7.1%	7.9%	91.5%
Manganese	1.9%	2.3%	2.5%	6.7%	93.0%
Nickel	1.6%	8.5%	1.4%	11.6%	87.2%
Silver	2.1%	0.7%	18.2%	21.1%	78.9%
Thallium	4.7%	4.3%	2.0%	11.0%	89.0%
Tin	7.1%	0.9%	0.9%	8.9%	88.8%
Zinc	1.0%	1.2%	0.6%	2.8%	97.2%

The effect of consideration of moose and caribou organ consumption in the risk characterization step is summarized in Table 6.5-3. As seen from this table, with the exception of cadmium exposure, consideration of organ consumption does not materially alter the risk assessment.

TABLE 6.5-3
COMPARISON OF HAZARD QUOTIENTS WITH AND WITHOUT ORGAN
CONSUMPTION FOR CAMPER 1 – EXISTING SCENARIO

COPC	Adult	
	Hazard Quotient without Organ Consumption	Hazard Quotient with Organ Consumption
Cadmium	0.056	2.41
Copper	0.074	0.13
Lead	0.08	0.08
Manganese	0.03	0.04
Nickel	0.002	0.003
Silver	0.03	0.03
Thallium	0.03	0.03
Tin	<0.001	<0.001
Zinc	0.17	0.18

Note: Values in bold and shade exceed a HQ of 0.5

7.0 SUMMARY AND CONCLUSIONS

The Interim Receiver commissioned SENES Consultants Limited to carry out an ecological and human health risk assessment for the Anvil Range Mine Complex to assist in the development of closure options for the site. The Anvil Range Mine Complex includes facilities at two locations, the Faro mine site and the Grum and Vangorda mine site. The Faro mine site is located within the Rose Creek watershed, a tributary of the Anvil Creek watershed, while the Grum and Vangorda mine site is located within the Vangorda Creek watershed. Both watersheds empty into the Pelly River.

A selection process was used to identify the contaminants of potential concern (COPC) at the Anvil Range Mine Complex. In summary, the concentrations of contaminants in water and soils in the affected area were compared statistically to background/baseline concentrations. Contaminants that were found to be significantly different were then compared to CCME guidelines for water (for protection of aquatic life) and/or for soil (for residential/parkland use). The aquatic life CCME guidelines were more restrictive than the drinking water guidelines for the COPC considered in this assessment. If the measured levels exceeded either guideline value or if guidelines were not available then the contaminants were carried through the risk assessment. For the vegetation samples, the measured concentrations in vegetation were first compared to background/baseline concentrations. Contaminants that were found to be statistically different from background/baseline were then compared to reported toxic levels in plants to determine the ability to cause adverse effects in plants. Contaminants with concentrations which were significantly higher than background but for which there were no toxic values, were not carried through the assessment. Contaminant concentrations that were higher than the toxic levels were carried through the assessment. Based on this screening procedure: arsenic; cadmium; copper; lead; manganese; nickel; silver; tin; thallium; and zinc were determined to be COPC.

To provide a basis for comparison of the effects of potential remedial options at the Anvil Range Mine Complex, an assessment was carried out of ecological and human health risks from exposure to existing conditions at the respective sites. “Existing” conditions in the aquatic environment were based largely on data collected during the 2002 to 2004 period in various sampling campaigns (Gartner Lee Limited 2004) on the Rose Creek and Vangorda Creek watersheds. In addition, measured contaminant levels in the terrestrial environment from a campaign carried out in both watersheds in 2004 (Gartner Lee Limited 2005b) were incorporated into the risk assessment.

As specific remediation alternatives have not yet been developed for the complex, contaminant loads to the environment were predicted for a range of possible alternatives and input to the risk assessment. The alternatives investigated ranged from:

- a “No Intervention” scenario, which as implied would entail doing nothing at the site;
- a “Remediation” scenario, which would involve taking measures to reduce contaminant loads and collect a large portion of the contaminated runoff and groundwater flows for treatment;
- a “Treat All Flows” scenario, which as implied would theoretically involve collection of all contaminated water for treatment in addition to taking measures to reduce contaminant sources.

For the “No Intervention” and “Remediation” scenarios, contaminant loads were predicted for two scenarios based on seepage quality and the “acid generating” potential of the rock. The Future 1 scenario being the assumption of “low acid generating” potential in the rock and the Future 3 scenario being the maximum “acid generating” potential of the rock. This scenario is considered to be a low probability scenario. As indicated above, the emphasis of the remediation measures is on reducing contaminant loads to the aquatic environment.

The assessment included the following elements which are proposed and readily accepted by regulatory agencies such as Environment Canada and the U.S. EPA:

- receptor characterization;
- exposure assessment;
- hazard assessment; and
- risk characterization.

The aquatic ecosystem assessment considered exposure of aquatic plants, phytoplankton, zooplankton, benthic organisms and fish (predatory and forage) to contaminants of potential concern (COPC) present in both the upstream and downstream reaches of Rose Creek and Vangorda Creek. Anvil Creek and the Pelly River were also considered in the assessment. Ecological impacts were characterized by the value of a simple screening index (SI) which is derived by dividing the exposure or intake value by an appropriate toxicity benchmark or toxicity reference value (TRV). Screening index values of less than 1 are generally considered to indicate low risk of adverse effect.

In addition, pathways modelling was conducted for several terrestrial receptors to estimate their potential exposure to COPC present across the site. The terrestrial receptors identified for inclusion in the assessment were based on information provided by First Nations people who use the site and included bear, beaver, caribou, ducks (mallard, merganser and scaup), fox, grouse, hare, hoary marmot, mink, moose, Fannin sheep and wolf. These receptors were chosen also because they provide a range of potential exposure across the site. The site was divided into different areas depending on the home range of the terrestrial receptors. Small terrestrial mammals such as hare, grouse and marmot, with small home ranges, were evaluated at several

smaller locations across the site. Mammals such as fox which has a larger home range were evaluated across a larger area and mammals such as caribou, moose and wolf with very large home ranges were evaluated on a site-wide basis. Ecological impacts were determined through a comparison to Lowest Observable Adverse Effects Levels (LOAELs) obtained from literature data.

An assessment of the potential implications to human health from exposure to COPC present on site was also considered for a number of hypothetical individuals (toddler, child, adult) with differing locations and time spent on site depending on the scenario being considered. Currently, the site is only used for gathering of berries and trapping; therefore, in the “Existing” scenario it was considered that individuals would be on site for only 1.5 months per year trapping small mammals and gathering berries from around the Faro mine site. For comparison, it was assumed that individuals would also be present in the Swim Lakes reference area for 1.5 months per year and would trap and gather berries from this baseline reference area but hunt large game on the Anvil Range mine site. Measured concentrations of caribou and moose captured at the site were used in the assessment. After remediation, it was assumed that conditions at the site were improved such that campers would be present on site and would trap and gather berries near the Vangorda site, as well as from downstream on the Rose Creek and Vangorda Creek watersheds. These campers were also assumed to spend 1.5 months per year in the study area but take game and fish off-site with consumption occurring over the year.

Pathways modelling was conducted to provide estimates of the potential exposures to these individuals. These estimates were based on dietary information combined with measured and predicted concentrations of COPC in the dietary components obtained from the study area including berries, small game, large game, medicinal plants, water and soil. Dietary information from a survey of First Nations people in the Yukon was used to determine the dietary characteristics for these individuals. Other exposure information, such as drinking water consumption and body weight was obtained from data on the general Canadian population.

7.1 SUMMARY OF RESULTS

To provide an overview of the results in the most meaningful manner, the results of the ecological and human health assessment were summarized by COPC and scenarios considered in the assessment. Thallium and tin were not measured in the aquatic environment and levels in the terrestrial environment were such that there were no concerns from both the ecological and human health standpoints; therefore these COPC will not be discussed further. Tables 7.1-1 to 7.1-8 provides a summary of the results for the remaining eight COPC namely arsenic, cadmium, copper, lead, manganese, nickel, silver and zinc.

A review of these tables indicates, not surprisingly, that the “No Intervention” Future 3 scenario is the worst scenario that has been evaluated. The “Existing” conditions scenario, which examines the conditions of the site in its current state and land use, determined that apart from some exceedances of CCME guidelines in some of the watersheds, the site as it is currently poses no risks to aquatic or terrestrial receptors. In addition, individuals who hunt, trap and collect berries and medicinal plants on site are not expected to experience any adverse effects.

In examining the COPC considered in the assessment, it can be concluded that nickel and silver exposure do not result in any risks to humans or terrestrial animals that would be present on the site and that any remedial alternatives that would reduce other COPC levels would also reduce these concentrations further. Therefore the discussion on the remedial alternatives focuses on arsenic, cadmium, copper, lead, manganese and zinc.

7.2 DISCUSSION OF REMEDIAL ALTERNATIVES

The remedial alternatives considered in the risk assessment were selected on the basis of controlling contaminant loads to the aquatic environment. Incidentally, some of the alternatives would also reduce dust emissions of tailings or waste rock as a result of covering the waste source(s) with clean cover material. None of the alternatives were considered to entail remediation of soils in the surrounding environment at the Anvil Range Mine Complex. As a simplifying assumption, it was considered that concentrations of COPC in soil and vegetation in the future are the same as those that are currently measured at the site. Risks associated with direct exposure to tailings and/or waste rock were not assessed.

The remediation alternatives are discussed below within the context of the following COPC; arsenic, cadmium, copper, lead, manganese and zinc. The summary tables demonstrate that, of these six COPC, zinc exposure is likely to result in potentially the highest risks.

7.2.1 “No Intervention” Scenarios

The “No Intervention” scenarios assumes no control or collection of water flowing into or out of waste rock dumps, mine pits and the tailings impoundment. All surface water and groundwater flows and contaminant loads were assumed to report to the receiving environment. Similarly, the waste sources were assumed to be left uncovered.

A review of Tables 7.1-1, 7.1-2, 7.1-3, 7.1-4, 7.1-5 and 7.1-8 indicates that the “No Intervention” Future 1 scenario while better than “No Intervention” Future 3 scenario could result in potential adverse effects on aquatic, terrestrial and human receptors that use the site. All receptors are predicted to receive very high zinc exposures. Under maximum “acid generating” conditions (Future 3 scenario), the exposures increase substantially as the groundwater plumes beneath the tailings impoundment and waste rock piles discharge to Rose Creek or Vangorda Creek.

Abandonment of the site does not represent a viable option.

TABLE 7.1-1
SUMMARY TABLE FOR ARSENIC ASSESSMENT

Scenario	Exceed CCME Aquatic Life Guidelines?				Exceed CCME PEL Sediment Quality Guidelines?				Aquatic Assessment – Most Exposed Fish				Terrestrial Assessment Species at Risk				Human Health Assessment	
	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	FM	Van	FM	Van
Existing	√	~	√	~	√	>	√	√	√	√	√	√	√	√	√	√	X	√
“No Intervention”- Future 1	>	>	>	√	>	>	>	√	√	√	√	√	Mi	√	√	√	√	√
“No Intervention” - Future 3	>>	>	>+	~	>>	>	>+	~	>	√	~	√	Du Mi Bv	√	Fox	√	X	√
Remediation - Future 2	√	√	√	√	√	>	√	√	√	√	√	√	√	√	√	√	X	X
Remediation - Future 3	>	√	√	√	>	>	~	√	√	√	√	√	√	√	√	√	X	X
Treat All Flows	√	√	√	√	√	>	√	√	√	√	√	√	√	√	√	√	X	X

LEGEND

RC Rose Creek
VC Vangorda Creek
AC Anvil Creek
PR Pelly River
FM Faro Mine
Van Vangorda Mine

√ meets all guidelines or benchmarks.
~ 1-2x guidelines or benchmarks.
> 2-10x guidelines or benchmarks.
>+ 10-100x guidelines or benchmarks.
>> >100x guidelines or benchmarks.
>>> >1000x guidelines or benchmarks.
>>>> >10,000x guidelines or benchmarks.
na not applicable.

Mi Mink
Bv Beaver
Du Duck

Human Health

X Above risk of 1×10^{-5}

TABLE 7.1-2
SUMMARY TABLE FOR CADMIUM ASSESSMENT

Scenario	Exceed CCME Aquatic Life Guidelines?				Exceed CCME PEL Sediment Quality Guidelines?				Aquatic Assessment – Most Exposed Fish				Terrestrial Assessment Species at Risk				Human Health Assessment					
	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	FM	Van	Faro			Vangorda		
Existing	> ⁺	> ⁺	~	> ⁺	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
“No Intervention” – Future 1	>>>	>>>	>>	> ⁺	>	> ⁺	>	√	> ⁺	> ⁺	>	√	Du	Du Mi	√	√	√	√	√	√	√	√
“No Intervention” - Future 3	>>>>	>>> >	>>>	>>	> ⁺	> ⁺	> ⁺	~	>>	>>	> ⁺	~	Du Mi Bv	Du Mi Bv	Fox	√	√	√	√	√	√	√
Remediation - Future 2	>>	>>	> ⁺	> ⁺	√	~	√	√	~	~	√	√	√	√	√	√	√	√	√	√	√	√
Remediation - Future 3	>>	>>	>>	> ⁺	>	~	√	√	>	~	~	√	√	√	√	√	√	√	√	√	√	√
Treat All Flows	>>	>>	> ⁺	> ⁺	√	~	√	√	~	~	√	√	√	√	√	√	√	√	√	√	√	√

LEGEND

RC Rose Creek
VC Vangorda Creek
AC Anvil Creek
PR Pelly River
FM Faro Mine
Van Vangorda Mine

Mi Mink
Bv Beaver
Du Duck
Mo Moose

Human Health

x Hazard Quotient = 0.5-1
xx Hazard Quotient = 1-2
xxx Hazard Quotient = 2-5
xxxx Hazard Quotient = 5+

√ meets all guidelines or benchmarks.
~ 1-2x guidelines or benchmarks.
> 2-10x guidelines or benchmarks.
>⁺ 10-100x guidelines or benchmarks.
>> >100x guidelines or benchmarks.
>>> >1000x guidelines or benchmarks.
>>>> >10,000x guidelines or benchmarks.
na not applicable.

**TABLE 7.1-3
SUMMARY TABLE FOR COPPER ASSESSMENT**

Scenario	Exceed CCME Aquatic Life Guidelines?				Exceed CCME PEL Sediment Quality Guidelines?				Aquatic Assessment – Most Exposed Fish				Terrestrial Assessment Species at Risk				Human Health Assessment					
	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	FM	Van	Faro			Vangorda		
Existing	~	√	√	>	√	√	√	√	√	√	√	>	√	√	√	√	√	√	√	√	√	√
“No Intervention” – Future 1	>>	>>	>>	>	>+	>+	>+	~	>>	>+	>+	>	Du Mi	Du Mi	√	√	√	√	√	√	√	√
“No Intervention” - Future 3	>>>	>>>	>>>	>+	>>	>>	>>	>	>>>	>>	>>	>+	Du Mi Bv	Du Mi Bv	Bear	Bear	√	√	√	√	√	√
Remediation - Future 2	>	~	>	>	~	√	~	~	>	√	>	~	√	√	√	√	√	√	√	√	√	√
Remediation - Future 3	>+	>	>+	>	>+	>	>	~	>+	>	>	~	√	√	√	√	x	√	√	√	√	√
Treat All Flows	~	>	>	>	~	>	~	~	~	>	~	~	√	√	√	√	√	√	√	√	√	√

LEGEND

RC Rose Creek
VC Vangorda Creek
AC Anvil Creek
PR Pelly River
FM Faro Mine
Van Vangorda Mine

Mi Mink
Bv Beaver
Du Duck
Mo Moose

Human Health

x Hazard Quotient = 0.5-1
xx Hazard Quotient = 1-2
xxx Hazard Quotient = 2-5
xxxx Hazard Quotient = 5+

√ meets all guidelines or benchmarks.
~ 1-2x guidelines or benchmarks.
> 2-10x guidelines or benchmarks.
>+ 10-100x guidelines or benchmarks.
>> >100x guidelines or benchmarks.
>>> >1000x guidelines or benchmarks.
>>>> >10,000x guidelines or benchmarks.
na not applicable.

**TABLE 7.1-4
SUMMARY TABLE FOR LEAD ASSESSMENT**

Scenario	Exceed CCME Aquatic Life Guidelines?				Exceed CCME PEL Sediment Quality Guidelines?				Aquatic Assessment – Most Exposed Fish				Terrestrial Assessment Species at Risk				Human Health Assessment					
	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	FM	Van	Faro			Vangorda		
Existing	>+	>	√	>	~	~	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
“No Intervention” - Future 1	>+	>+	>	>	~	>	√	~	√	√	√	√	√	√	√	√	√	√	√	√	√	√
“No Intervention” - Future 3	>+	>+	>+	>	>	>+	>	~	>	>	√	√	√	√	√	√	√	√	√	√	√	√
Remediation - Future 2	>+	>+	>	>	~	>	~	~	√	√	√	√	√	√	√	√	x	√	√	√	√	√
Remediation - Future 3	>+	>+	>	>	~	>	~	~	√	√	√	√	√	√	√	√	x	√	√	√	√	√
Treat All Flows	>+	>+	>	>	~	>	~	~	√	√	√	√	√	√	√	√	√	√	√	√	√	√

LEGEND

RC Rose Creek
VC Vangorda Creek
AC Anvil Creek
PR Pelly River
FM Faro Mine
Van Vangorda Mine

Mi Mink
Bv Beaver
Du Duck

Human Health

x Hazard Quotient = 0.5-1
xx Hazard Quotient = 1-2
xxx Hazard Quotient = 2-5
xxxx Hazard Quotient = 5+

√ meets all guidelines or benchmarks.
~ 1-2x guidelines or benchmarks.
> 2-10x guidelines or benchmarks.
>+ 10-100x guidelines or benchmarks.
>> >100x guidelines or benchmarks.
>>> >1000x guidelines or benchmarks.
>>>> >10,000x guidelines or benchmarks.
na not applicable.

**TABLE 7.1-5
SUMMARY TABLE FOR MANGANESE ASSESSMENT**

Scenario	Exceed CCME Aquatic Life Guidelines?				Exceed CCME PEL Sediment Quality Guidelines?				Aquatic Assessment – Most Exposed Fish				Terrestrial Assessment Species at Risk				Human Health Assessment					
	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	FM	Van	Faro			Vangorda		
Existing	na	na	na	na	>	√	√	√	>	√	√	√	√	√	√	√	√	√	√	√	√	√
“No Intervention” - Future 1	na	na	na	na	>	>+	>	√	~	>+	√	√	√	Mi	√	√	√	√	√	√	√	√
“No Intervention” - Future 3	na	na	na	na	>>	>>	>+	~	>+	>+	>	√	Du Mi	Bv Du Mi	√	√	√	√	√	√	√	√
Remediation - Future 2	na	na	na	na	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Remediation - Future 3	na	na	na	na	>	>	~	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Treat All Flows	na	na	na	na	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

LEGEND

RC Rose Creek
VC Vangorda Creek
AC Anvil Creek
PR Pelly River
FM Faro Mine
Van Vangorda Mine

Mi Mink
Bv Beaver
Du Duck

Human Health

x Hazard Quotient = 0.5-1
xx Hazard Quotient = 1-2
xxx Hazard Quotient = 2-5
xxxx Hazard Quotient = 5+

√ meets all guidelines or benchmarks.
~ 1-2x guidelines or benchmarks.
> 2-10x guidelines or benchmarks.
>+ 10-100x guidelines or benchmarks.
>> >100x guidelines or benchmarks.
>>> >1000x guidelines or benchmarks.
>>>> >10,000x guidelines or benchmarks.
na not applicable.

TABLE 7.1-6
SUMMARY TABLE FOR NICKEL ASSESSMENT

Scenario	Exceed CCME Aquatic Life Guidelines?				Exceed CCME PEL Sediment Quality Guidelines?				Aquatic Assessment – Most Exposed Fish				Terrestrial Assessment Species at Risk				Human Health Assessment					
	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	FM	Van	Faro			Vangorda		
Existing	√	√	√	√	~	>	√	~	√	√	√	√	√	√	√	√	√	√	√	√	√	√
“No Intervention” - Future 1	~	>	√	√	>	>+	~	√	√	~	√	√	√	√	√	√	√	√	√	√	√	√
“No Intervention” - Future 3	>	>+	>	√	>+	>>	>+	√	>	>	√	√	√	√	√	√	√	√	√	√	√	√
Remediation - Future 2	√	√	√	√	~	>	~	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Remediation - Future 3	√	√	√	√	>	>	~	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Treat All Flows	√	√	√	√	~	>	~	√	√	√	√	√	√	√	√	√	x	√	√	√	√	√

LEGEND

RC Rose Creek
VC Vangorda Creek
AC Anvil Creek
PR Pelly River
FM Faro Mine
Van Vangorda Mine

Mi Mink
Bv Beaver
Du Duck

Human Health

x Hazard Quotient = 0.5-1
xx Hazard Quotient = 1-2
xxx Hazard Quotient = 2-5
xxxx Hazard Quotient = 5+

√ meets all guidelines or benchmarks.
~ 1-2x guidelines or benchmarks.
> 2-10x guidelines or benchmarks.
>+ 10-100x guidelines or benchmarks.
>> >100x guidelines or benchmarks.
>>> >1000x guidelines or benchmarks.
>>>> >10,000x guidelines or benchmarks.
na not applicable.

TABLE 7.1-7
SUMMARY TABLE FOR SILVER ASSESSMENT

Scenario	Exceed CCME Aquatic Life Guidelines?				Exceed CCME PEL Sediment Quality Guidelines?				Aquatic Assessment – Most Exposed Fish				Terrestrial Assessment Species at Risk				Human Health Assessment					
	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	FM	Van	Faro			Vangorda		
Existing	>	~	~	~	na	na	na	na	√	√	√	√	√	√	√	√	√	√	√	√	√	√
“No Intervention” - Future 1	>+	>	>	√	na	na	na	na	~	~	√	√	√	√	√	√	√	√	√	√	√	√
“No Intervention” - Future 3	>+	>	>+	√	na	na	na	na	>+	~	>	√	√	√	√	√	√	√	√	√	√	√
Remediation - Future 2	~	>	~	√	na	na	na	na	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Remediation - Future 3	>	>	~	√	na	na	na	na	√	√	√	√	√	√	√	√	√	√	√	√	√	√
Treat All Flows	√	>	√	√	na	na	na	na	√	√	√	√	√	√	√	√	√	√	√	√	√	√

LEGEND

RC Rose Creek
VC Vangorda Creek
AC Anvil Creek
PR Pelly River
FM Faro Mine
Van Vangorda Mine

Mi Mink
Bv Beaver
Du Duck

Human Health

x Hazard Quotient = 0.5-1
xx Hazard Quotient = 1-2
xxx Hazard Quotient = 2-5
xxxx Hazard Quotient = 5+

√ meets all guidelines or benchmarks.
~ 1-2x guidelines or benchmarks.
> 2-10x guidelines or benchmarks.
>+ 10-100x guidelines or benchmarks.
>> >100x guidelines or benchmarks.
>>> >1000x guidelines or benchmarks.
>>>> >10,000x guidelines or benchmarks.
na not applicable.

Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

TABLE 7.1-8
SUMMARY TABLE FOR ZINC ASSESSMENT

Scenario	Exceed CCME Aquatic Life Guidelines?				Exceed CCME PEL Sediment Quality Guidelines?				Aquatic Assessment – Most Exposed Fish				Terrestrial Assessment Species at Risk					Human Health Assessment					
	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	AC	PR	RC	VC	FM	Van	PR	Faro			Vangorda		
Existing	>	>	√	>	√	>	√	√	~	~	√	~	√	Du	√	√	√	√	√	√	√	√	√
“No Intervention” - Future 1	>>	>>	>>	>	>>	>>	>+	~	>>	>>	>+	>	Du Mi	Bv Du Mi	√	Fox	√	√	√	√	√	√	√
“No Intervention” - Future 3	>>>	>>>	>>>	>+	>>>	>>>	>>	>+	>>>	>>>	>>	>+	Bv Du Mi	Bv Du Mi	Bear Fox Wolf	Bear Fox Wolf	Du	x	x	√	√	√	√
Remediation - Future 2	>+	~	>	√	>	√	~	√	>	√	>	√	Du	√	√	√	√	√	√	√	√	√	√
Remediation - Future 3	>>	>+	>+	~	>+	>	>+	√	>+	>+	>	√	Du Mi	Du	√	√	√	xx	xx	x	x	√	√
Treat All Flows	~	~	~	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√

LEGEND

RC Rose Creek
VC Vangorda Creek
AC Anvil Creek
PR Pelly River
FM Faro Mine
Van Vangorda Mine

Mi Mink
Bv Beaver
Du Duck

Human Health

x Hazard Quotient = 0.5-1
xx Hazard Quotient = 1-2
xxx Hazard Quotient = 2-5
xxxx Hazard Quotient = 5+

√ meets all guidelines or benchmarks.
~ 1-2x guidelines or benchmarks.
> 2-10x guidelines or benchmarks.
>+ 10-100x guidelines or benchmarks.
>> >100x guidelines or benchmarks.
>>> >1000x guidelines or benchmarks.
>>>> >10,000x guidelines or benchmarks.
na not applicable.

7.2.2 “Remediation” Scenarios

The hypothetical “Remediation” scenarios examine the effects of a combination of source control measures to reduce contaminant loads as well as collection and treatment of contaminated waters. It should be noted that these scenarios do not represent a planned closure option. In these scenarios, it was assumed that the remedial activities at the site would be such that individuals would camp on site for 1.5 months per year and take game and fish from the site and consume over a year.

In the “Remediation” Future 2 scenario, cadmium, lead and manganese are predicted to pose a low level of risk to ecological and human receptors. Toddlers are predicted to have exposures that marginally exceed a HQ of 0.5 at the Faro Mine site. Arsenic exposures result in incremental risk levels above 1×10^{-5} ; however, some exposure captures background (i.e. soil, game and fish) and therefore true incremental exposures are not calculated. From an ecological perspective, copper and zinc concentrations in Rose Creek and Anvil Creek may cause potential adverse effects in fish in this scenario.

In the “Remediation” Future 3 scenario, when the maximum “acid generating” potential is realized, the risks from exposure to arsenic, cadmium, lead and manganese remain essentially unchanged; however, potential unacceptable exposures from copper and zinc in the aquatic environment are increased. Zinc exposures in this scenario also represent a potential risk to terrestrial receptors such as duck and mink.

The results indicate that the Future 2 assumptions are a good basis for developing an appropriate remedial option.

7.2.3 “Treat All Flows” Scenario

The “Treat All Flows” scenario was intended to illustrate the future effects of collecting all contaminated water from the site and releasing it as treated effluent. While collection of 100% of the contaminated water is not practical, the scenario was intended to provide insight into whether source control may be required in order to achieve acceptable receiving water conditions. The scenario evaluates future receiving water quality where contaminants produced from the waste rock dumps, the tailings impoundment and the mine pits are collected for treatment.

No surprisingly, this scenario represents the best of the scenarios considered in the assessment.

7.3 OVERALL CONCLUSIONS AND RECOMMENDATIONS

The risk assessment was undertaken using measured data where available from the site. There is a very good database for water, soils/sediments, and terrestrial vegetation to provide a good representation of the site; however, as with all risk assessments the collection of additional data always helps to increase the level of confidence in the assessment. As the primary objective of the risk assessment was to compare the relative ecological and human health risks of a range of remediation scenarios, the database for the site was considered to be adequate. However, in the future, it would be beneficial to collect more information from the site. For example, a large area of uncertainty in the assessment surrounded the use of the site by humans as well as the dietary characteristics of the First Nation people who hunt, gather and trap at the site.

Based on the results of the risk assessment, nickel and silver were found to pose low risks of adverse effects on ecological or human receptors in all of the scenarios considered in the assessment. Similarly, thallium and tin were shown to pose low risks of adverse effects on all receptors.

The current conditions at the site as evaluated by the “Existing” scenario are not expected to result in adverse effects in aquatic, terrestrial or human receptors that are currently present on the site. However, the human health risk assessment indicated that consumption of caribou and moose organs, which accumulate cadmium, could pose a risk of adverse effects. Therefore, the consumption of kidneys from caribou and moose should not occur on a regular basis.

In the “No Intervention” Future 1 and Future 3 scenarios all receptors are predicted to receive very high exposures to several of the COPC and particularly zinc. Abandonment of the site does not represent a viable option.

In the “Remediation” Future 2 scenario, lead and manganese exposures are predicted to pose low risks to aquatic and terrestrial receptors as well as humans who may use the site. Arsenic exposures are predicted to result in acceptable risks to ecological receptors; however, there are exposures for humans associated with background arsenic that are above the Health Canada risk level for “essentially negligible” risk. Copper and zinc exposures in Rose Creek and Anvil Creek may result in potential adverse effects in fish. This scenario represents a good basis to develop an appropriate remedial option.

In the “Remediation” Future 3 scenario, when the “acid generating” potential is maximum, potential unacceptable exposures from copper and zinc in the aquatic environment are increased. Zinc exposures in this scenario also represent a potential for adverse effects in terrestrial receptors such as duck and mink. However, this is a low probability scenario.

The hypothetical “Treat All Flows” scenario was found to pose few risks to ecological species or humans.

8.0 REFERENCES

- American Industrial Health Council (AIHC) 1992. *Improving Risk Characterization. Proceedings of a Symposium, 26-27 September, 1991.* American Industrial Health Council, Washington, DC.
- Baes, C.F., R.D. Sharp, A.L. Sjöreen, and R.W. Shar 1984. *A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides Through Agriculture.* ORNL-5786.
- Belovsky, G.E., P.A. Jordan, and D.B. Botkin 1973. *Summer Browsing by Moose in Relation to Preference and Animal Density: A New Quantitative Approach.* Proceedings of the 9th North American Moose Conference and Workshop, Quebec City, March.
- Beyer, W. N., E. Connor, and S. Gerould 1994. *Survey of Soil Ingestion by Wildlife.* Journal of Wildlife Management 58:375-382.
- Birge, W.J., J.E. Hudson, J.A. Black and A.G. Wasterman 1979a. *Embryo-larval Bioassays on Inorganic Coal Elements and In Situ Biomonitoring of Coal-waste Effluents.* In: Surface mining and fish/wildlife needs in the eastern United States, D.E. Samuel, J.R. Stauffer, C.H. Hocutt, and W.T. Mason Jr., eds. pp. 97-104. Fish and Wildlife Service, Office of Biological Services. FWS/OBS-78/81. U.S. Government Printing Office, Washington, D.C. {cited in CCME 1999, arsenic}.
- Birge, W.J., J.A. Black, and A.G. Westerman 1979b. *Evaluation of Aquatic Pollutants Using Fish and Amphibian Eggs as Bioassay Organisms.* In: S.W. Nielsen, G. Migaki, and D.G. Scarpelli (Eds.), Symp. Animals Monitors Environ. Pollut., 1977, Storrs, CT 12: 108-118. {cited in U.S. EPA AQUIRE, arsenic, aluminum and lead, molybdenum}.
- Birge, W.J. 1978. *Aquatic Toxicology of Trace Elements of Coal and Fly Ash.* In: Energy and environmental stress in aquatic systems, J.H. Thorp and J.W. Gibbons, eds. Department of Energy Symposium Series CONF 771114. {cited in CCME 1999, MOE 1996}.
- Borgmann, U., R. Cove and C. Loveridge 1980. *Effects of Metal on the Biomass Production Kinetics of Freshwater Copepods.* Can. J. Fish. Aquat. Sci. 37: 567-575. {cited in CCME 1999}.

- Cadwell, R.D., B. Parkhurst, W. Warren-Hicks and J. Volosin 1993. *Aquatic Ecological Risk Assessment and Clean-up Goals for Metals Arising from Mining Operations*. pp 61-72. In Bender, E.S. and F.A. Jones (eds.) *Applications of Ecological Risk Assessment to Hazardous Waste Site Remediation*. Water Environment Federation, Alexandria, Virginia.
- Call, D.J., L.T. Brooke, R.J. Kent, N. Ahmed, and J.E. Richter 1984. *Project Summary: Toxicological Studies with Herbicides, Selected EPA Priority Pollutants and Related Chemicals in Aquatic Organisms*. National Technical Information Service. Springfield, Virginia. PB83-263665. {cited in MOE 1988}.
- Canadian Council of Ministers of the Environment (CCME) 2003. *Canadian Environmental Quality Guidelines – Canadian Water Quality Guidelines for the Protection of Aquatic Life*. Pub No. 1299.
- Canadian Council of Ministers of the Environment (CCME) 1997. *A Framework for Ecological Risk Assessment: Technical Appendices*. March.
- Canadian Council of Ministers of the Environment (CCME) 1996. *A Framework for Ecological Risk Assessment: General Guidance*. March.
- Canadian Standards Association (CSA) 1987. *Guidelines for Calculating Derived Release Rate Limits for Radioactive Material in Airborne and Liquid Effluents for Normal Operation of Nuclear Facilities*. CAN ICSA-N288.1-M87.
- Canadian Wildlife Service (CWS) 1997. *Hinterland Who's Who*. Environment Canada. http://www.cws-scf.ec.gc.ca/hww-fap/index_e.cfm.
- Carlson, A.R., J.A. Tucker, V.R. Mattson, G.L. Phipps, P.M. Cook, G.F. Olson and F.A. Puglisi 1982. *Cadmium and Endrin Toxicity to Fish in Water Containing Mineral Fibers*. EPA-600/S3-82-053. U.S. Environmental Protection Agency, Duluth, Minn. {cited in Suter and Tsao 1996}.
- C.E. Jones and Associates Limited 2003. *Metals in Vegetation and Soils Study at the Anvil Range Mine Complex in 2002*. Prepared for Gartner Lee Limited. March.
- Coad, S. 1994. *Consumption of Fish and Wildlife by Canadian Nature Peoples: A Quantitative Assessment from the Published and Unpublished Literature. Final Draft*. Health and Welfare Canada. January.

- Environment Canada/Health Canada (EC/HC) 2001. *Priority Substances List Assessment Report: Releases of Radionuclides from Nuclear Facilities (Impact on Non-Human Biota)*. Revised Draft July 2001.
- Environment Canada 1997. *Environmental Assessments of Priority Substances Under the Canadian Environmental Protection Act*. Guidance Manual Version 1.0, March.
- Environment Canada 1993. *Canadian Environmental Protection Act: Priority Substances List Assessment Report – Arsenic*.
- Gartner Lee Limited 2005a. *Spreadsheets on Water Quality for the Anvil Mine Complex*. Provided by L. Comm.
- Gartner Lee Limited 2005b. *Anvil Range Mine Complex – Terrestrial Effects Study: Investigation into Metal Concentrations in Vegetation, Wildlife and Soils*. Prepared for Deloitte & Touche Inc. Draft for Discussion. April.
- Gartner Lee Limited 2002. *Anvil Range Mine Complex: 2002 Baseline Environmental Information*. Volume 2 of 2. Project Description. May 2002.
- Goettl, J.P. Jr. and P.H. Davies 1976. *Water Pollution Studies*. Federal Aid Project F-33-R-11. Department of Natural Resources, Colorado Division of Wildlife. {cited in Suter and Tsao 1996}.
- Health Canada. 2005. *Canadian Total Diet Study. Health Canada Food Program*. Last accessed April 14, 2005. www.hc-sc.gc.ca/food-aliments/cs-ipc/fr-ra/e_tds.html.
- Health Canada 1994. *Human Health Risk Assessment for Priority Substances*. Canadian Environmental Protection Act
- Holcroft, A.C. and S. Herrero 1991. *Black Bear, Ursus americanus, Food Habits in Southwestern Alberta*. Can. Field-Nat. 105:335-345.
- Hooftman, R.N., D.M.M. Adema, and J. Kauffman-Van Bommel 1989. *Developing a Set of Test Methods for the Toxicological Analysis of the Pollution Degree of Waterbottoms*. Rep.No.16105, Netherlands Organization for Applied Scientific Research: 68 p.(DUT). {cited in U.S. EPA AQUIRE}.

- Ingersoll, C.G., F.J. Dwyer, and T.W. May 1990. *Toxicity of Inorganic and Organic Selenium to Daphnia magna (Cladocera) and Chironomus riparius (Diptera)*. Environ. Toxicol. Chem. 9(9): 1171-1181. {cited in U.S. EPA AQUIRE}.
- International Programme for Chemical Safety (IPCS) 2000. *Short List Definitions. Harmonization Project (Terminology)*. Exposure Assessment Planning Workgroup. (<http://www.ipcsharmonize.org/>).
- International Atomic Energy Agency (IAEA) 1994. *Handbook of Parameter Values for the Prediction of Radionuclide Transfer in Temperate Environments*. International Atomic Energy Agency, Vienna.
- Klaverkamp, J.F., D.A. Hodgins, and A.Lutz 1983. *Selenite Toxicity and Mercury-selenium Interactions in Juvenile Fish*. Arch. Environ. Contam. Toxicol. 12: 405-413. {cited in U.S. EPA 1987}.
- Kurias, J., P. Thompson and S. Munger 2000. *Using Benthic Invertebrates and Sediment Chemistry Monitoring Data for Estimating LELs and SELs for Contaminants of Concern at Uranium Mine Sites in Northern Saskatchewan*. Atomic Energy Control Board of Canada. In press.
- Laberge Environmental Services 2004. *Biological and Sediment Monitoring Program at Rose and Anvil Creeks, Faro, Y.T. 2004*. December.
- Leland, H.V. and J.S. Kuwabara 1985. *Trace Metals*. Pg. 374-415. In Rand, G.M. and S.R. Petrocelli (eds) *Aquatic Toxicology*. Hemisphere Publishing Corporation, New York.
- Levin, S.A., M.A. Harwell, J.R. Kelly and K.D Kimball (eds.) 1989. *Ecotoxicology: Problems and Approaches*. Springer-Verlag, New York. 547.
- Liber, K. and S.L. White-Sobey 2000. *Toxicity of Uranium, Molybdenum, Nickel, and Arsenic to Hyalella azteca and Chironomus Tentans in Water-only and Spiked-sediment Toxicity Tests*. Toxicology Centre, University of Saskatchewan.
- Long, E.R., MacDonald, D.D., Smith, S.L. & Calder, E.D. 1995. *Incidence of Adverse Biological Effects within Ranges of Chemical Concentrations in Marine and Estuarine Sediments*. Environmental Management 19, 81-97.

- Marr, J.C.A., J. Lipton, D. Cacela, J.A. Hansen, J.S. Meyer and H.L. Bergman 1999. *Bioavailability and Acute Toxicity of Copper to Rainbow Trout (Oncorhynchus mykiss) in the Presence of Organic Acids Simulating Natural Dissolved Organic Carbon*. Can. J. Fish. Aquat. Sci. 56: 1471-1583.
- Munkittrick, K.R., and D.G. Dixon 1987. *Assessment of Reproductive Capacity and Larval Development of Feral White Suckers (Catostomus commersoni) Exposed to Chronic Elevations of Copper*. In: J.S.S.Lakshminarayana (Ed.), Proc.13th Annual Aquatic Toxicity Workshop, Nov.12-14, 1986, Moncton, New Brunswick, Can.Tech.Rep.Fish.Aquat.Sci.No.1575:44-46 (ABS). {cited in U.S. EPA AQUIRE}.
- National Environmental Policy Institute (NEPI) 2000. *Assessing the Bioavailability of Metals in Soil for Use in Human Health Risk Assessments*. Bioavailability Policy Report Phase II: Metals Task Force Report. Summer 2000.
- Nebeker, A.V., C. Savonen and D.G. Stevens 1985. *Sensitivity of Rainbow Trout Early Life Stages to Nickel Chloride*. Environ. Toxicol. Chem. 4: 233-239. {cited in Suter and Tsao 1996}.
- Ontario Ministry of the Environment (MOE) 1997. *Protection and Management of Aquatic Sediment Quality in Ontario*. Ontario Ministry of the Environment. ISBN0-7729-9248-7. August 1993.
- Ontario Ministry of the Environment (MOE) 1996. *Scientific Criteria Document for the Development of a Provincial Water Quality Objective for Cobalt (Stable Isotope)*. October 1996.
- Ontario Ministry of the Environment (MOE) 1994. *Scientific Criteria Document for Multimedia Environmental Standards Development – Lead*.
- Ontario Ministry of the Environment (MOE) 1988. *Scientific Criteria Document for Development of Provincial Water Quality Objectives and Guidelines: Lead*. June 1988.
- Pease, J.L., R.H. Vowles and L.B. Keith 1979. *Interaction of Snowshoe Hares and Woody Vegetation*. J. Wildl. Manage. 43: 43-60.
- Phipps, G.L., V.R. Mattson, and G.T. Ankley 1995. *Relative Sensitivity of Three Freshwater Benthic Macroinvertebrates to Ten Contaminants*. Arch. Environ. Contam. Toxicol. 28(3): 281-286. {cited in U.S. EPA AQUIRE}.

- Receveur, O., N. Kassi, H.M. Chan, P.B. Berti, H.V. Kuhnlein 1998. *Yukon First Nations' Assessment of Dietary Benefit/Risk*. Centre for Indigenous Peoples' Nutrition and Environment (CINE). McGill University. Ste-Anne-de-Bellevue, Quebec. May.
- Rehwoldt, R., L. Lasko, C. Shaw, and E. Wirhowski 1973. *The Acute Toxicity of Some Heavy Metal Ions Toward Benthic Organisms*. Environ. Pollut. 62(1): 73-85. {cited in U.S. EPA AQUIRE}.
- Rehwoldt, R., L.W. Menapace, B. Nerrie, and D. Allesandrello 1972. *The Effect of Increased Temperature Upon the Acute Toxicity of Some Heavy Metal Ions*. Bull. Environ. Contam. Toxicol. 8(2): 91-96. {cited in U.S. EPA AQUIRE}.
- Richardson, G.M. 1997. *Compendium of Canadian Human Exposure Factors for Risk Assessment*. O'Connor Associates Environmental Inc.
- Sample, B.E., D.M. Opresko, G.W. Suter II 1996. *Toxicological Benchmarks for Wildlife: 1996 Revision*. June 1996.
- Sauter, S., K.S. Buxton, K.J. Macek, and S.R. Petrocelli 1976. *Effects Exposure to Heavy Metals on Selected Freshwater Fish*. EPA-600/3-76-105. U.S. Environmental Protection Agency, Duluth, Minn. {cited in Suter and Tsao 1996}.
- Schmidt, J.L. and D.L. Gilbert 1978. *Big Game of North America, Ecology and Management*. Stackpole Books, Harrisburg, PA 17105.
- Spehar, R.L. 1976. *Cadmium and Zinc Toxicity to Flagfish (Jordanella floridae)*. J. Fish. Res. Board Can. 33: 1939-1945. {cited in Suter and Tsao 1996}.
- Suter, G.W. II. 1991. *Screening Level Risk Assessment of Off-site Ecological Effects in Surface Waters Downstream of the U.S. Department of Energy Oak Ridge Reservation*. ORNL/ER-8. Oak Ridge National Laboratory, Oak Ridge, Tennessee.
- Suter and Tsao 1996. *Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision*. U.S. Department of Energy. June.
- Thomas, D.C. and S.J. Barry 1991. *Microhistological Analyses of Caribou Diet: Fecal Versus Rumen Samples and Other Variables*. Pages 516-529 in Proc. Fourth North Amer. Caribou Workshop. C.E. Buttler and S.P. Mahoney (eds). Newf.-Lab. Wildl. Div., St. John's, Newfoundland.

- United States Environmental Protection Agency (U.S. EPA) AQUIRE 2002. *Aquatic Toxicity Information Retrieval Database*. On-line database. <http://www.epa.gov/ecotox/>.
- United States Environmental Protection Agency (U.S. EPA) IRIS 2002. *Integrated Risk Information System - IRIS*. On-line database. <http://www.epa.gov/iris/>.
- United States Environmental Protection Agency (U.S. EPA) NCEA 2001. *National Center for Environmental Assessment - NCEA*.
- United States Environmental Protection Agency (U.S. EPA) 1998. *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities*. Peer Review Draft. EPA 530-D-98-001.
- United States Environmental Protection Agency (U.S. EPA) 1997. *Health Effects Assessment Summary Tables - HEAST*. EPA/540/R-97-036. July.
- United States Environmental Protection Agency (U.S. EPA) 1993. *Wildlife Exposure Factors Handbook*. EPA/600/R-93/187.
- United States Environmental Protection Agency (U.S. EPA) 1992. *Framework for Ecological Risk Analysis*. EPA/630/R-92-001. Washington DC.
- United States Environmental Protection Agency (U.S. EPA) 1987. *Ambient Water Quality Criteria for Selenium - 1987*. EPA 440/5-87-008. U.S. EPA, Washington, D.C. {cited in Suter and Tsao 1996}.
- United States National Council on Radiation Protection and Measurements (NCRP) 1996. *Screening Models for Release of Radionuclides to Atmosphere, Surface Water and Ground*. NCRP Report No. 123.
- White Mountain Environmental Consulting 2005. *Pelly River Aquatic Effects Assessment – 2004 Draft*. February.
- White Mountain Environmental Consulting 2004. *Aquatic Life Sampling and Testing Program for the Anvil Range Mine Site, Rose and Vangorda Creek Watersheds, Faro, Yukon*. Prepared for Deloitte and Touche Inc. October.

APPENDIX A

PREDICTED WATER QUALITY DATA

(Provided by SRK Consulting)

- Base Case (No Intervention) Scenario
- Case 1: Hypothetical “Remediation” Scenario
 - Case 2: “Treat All Flows” Scenario

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APPENDIX A: PREDICTED WATER CONCENTRATIONS AVAILABLE FOR THE ANVIL RANGE MINE SITE ENVIRONS

A.1 OVERALL DESCRIPTION

Predicted water quality data provided by the SRK Consulting for the Anvil Range Mine site environs are presented here. The predicted water qualities were based on three modeling scenarios: base case (no intervention) scenario, hypothetical “remediation” scenario, and “treat all flows” scenario. In each of these three cases, sub-scenarios were developed: current average conditions, current maximum/intermediate loading conditions and future worst case. Vangorda Creek catchment, Rose Creek at Faro mine site and Pelly River watershed were examined.

Grum Vangorda Site

Concentrations Estimates for Vangorda Creek Catchments

Loadings: Current Average Conditions

Concentrations at V27

	Flow (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	220	0.0008	0.287	0.014	59.945	0.022	0.202	0.067	0.168	4.295	2.867
Feb	173	0.0009	0.318	0.015	63.610	0.025	0.230	0.077	0.190	4.900	3.205
Mar	185	0.0010	0.362	0.017	68.442	0.030	0.269	0.090	0.221	5.740	3.352
Apr	301	0.0009	0.317	0.015	62.369	0.024	0.225	0.074	0.186	4.784	2.464
May	2006	0.0006	0.124	0.006	40.013	0.005	0.049	0.014	0.047	1.003	1.028
Jun	2048	0.0006	0.135	0.006	41.208	0.006	0.059	0.018	0.055	1.213	1.046
Jul	1445	0.0006	0.145	0.007	42.444	0.007	0.068	0.021	0.063	1.419	1.150
Aug	1020	0.0006	0.147	0.007	42.785	0.007	0.070	0.022	0.064	1.464	1.257
Sep	1358	0.0006	0.132	0.006	41.077	0.006	0.057	0.017	0.054	1.179	1.126
Oct	727	0.0006	0.153	0.007	43.654	0.008	0.077	0.024	0.069	1.597	1.412
Nov	367	0.0007	0.219	0.010	51.493	0.015	0.138	0.045	0.117	2.908	2.024
Dec	299	0.0008	0.253	0.012	55.533	0.018	0.169	0.055	0.142	3.581	2.358

Average 0.0007 0.2160 0.0102 0.0144 0.1147

Concentrations at V8

	Flow (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	407	0.0005	0.2046	0.0079	33.7448	0.0165	0.1131	0.0505	0.1258	3.2571	1.5850
Feb	309	0.0005	0.2353	0.0090	37.0463	0.0195	0.1330	0.0596	0.1474	3.8389	1.8286
Mar	324	0.0006	0.2773	0.0105	41.0328	0.0234	0.1595	0.0717	0.1764	4.6174	1.9665
Apr	567	0.0005	0.2227	0.0084	34.6160	0.0179	0.1237	0.0551	0.1375	3.5684	1.3477
May	4337	0.0003	0.0655	0.0026	18.7340	0.0029	0.0231	0.0090	0.0279	0.6229	0.4814
Jun	4448	0.0003	0.0725	0.0029	19.2612	0.0036	0.0278	0.0111	0.0328	0.7571	0.4891
Jul	3119	0.0003	0.0799	0.0031	20.0086	0.0043	0.0326	0.0133	0.0380	0.8970	0.5415
Aug	2191	0.0003	0.0815	0.0032	20.2749	0.0045	0.0338	0.0139	0.0393	0.9317	0.5942
Sep	2933	0.0003	0.0714	0.0029	19.3015	0.0035	0.0272	0.0109	0.0322	0.7392	0.5286
Oct	1549	0.0003	0.0863	0.0034	20.8941	0.0050	0.0371	0.0154	0.0429	1.0286	0.6733
Nov	741	0.0004	0.1381	0.0053	26.2862	0.0100	0.0704	0.0307	0.0792	2.0046	1.0222
Dec	575	0.0004	0.1702	0.0065	29.8758	0.0131	0.0906	0.0401	0.1014	2.5988	1.2514

Grum Vangorda Site

Concentrations Estimates for Vangorda

Loadings: Current Average Cond

Concentrations at V27

	Flow (x1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	220	37.944	6.027	6.112	0.101	0.019	224.334	17.817
Feb	173	41.891	6.911	6.744	0.115	0.021	255.444	20.437
Mar	185	46.957	8.128	6.923	0.134	0.023	293.277	24.042
Apr	301	40.271	6.718	5.158	0.111	0.018	238.285	19.866
May	2006	16.486	1.215	2.678	0.024	0.006	55.230	3.567
Jun	2048	17.737	1.518	2.681	0.028	0.007	64.466	4.467
Jul	1445	19.065	1.819	2.871	0.033	0.008	74.865	5.356
Aug	1020	19.467	1.888	3.095	0.034	0.008	78.566	5.561
Sep	1358	17.636	1.471	2.860	0.028	0.007	64.305	4.327
Oct	727	20.438	2.085	3.409	0.038	0.009	86.752	6.144
Nov	367	28.827	3.996	4.516	0.068	0.013	152.087	11.805
Dec	299	33.148	4.979	5.130	0.084	0.016	185.821	14.714

Average 3.8962 0.0665 0.0129 11.5087

Concentrations at V8

	Flow (x1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	407	23.2886	4.5982	3.3370	0.0696	0.0115	146.0516	13.5704
Feb	309	26.6403	5.4395	3.7988	0.0820	0.0133	171.7420	16.0555
Mar	324	30.8083	6.5611	4.0045	0.0980	0.0152	203.0522	19.3697
Apr	567	24.4484	5.0406	2.7772	0.0751	0.0114	153.8195	14.8786
May	4337	8.0956	0.7893	1.2439	0.0134	0.0032	29.7414	2.3186
Jun	4448	8.7560	0.9834	1.2416	0.0161	0.0035	34.9303	2.8924
Jul	3119	9.5433	1.1858	1.3383	0.0191	0.0039	41.0192	3.4904
Aug	2191	9.8028	1.2369	1.4493	0.0200	0.0042	43.1807	3.6412
Sep	2933	8.7405	0.9582	1.3310	0.0159	0.0036	34.8886	2.8176
Oct	1549	10.4213	1.3781	1.6101	0.0222	0.0046	48.0961	4.0581
Nov	741	15.9413	2.7883	2.2536	0.0428	0.0074	90.2256	8.2240
Dec	575	19.3979	3.6449	2.6876	0.0554	0.0093	116.0349	10.7544

Grum Vangorda Site

Concentrations Estimates for Vangorda Creek Catchments

Loadings: Current Maximum Conditions

Concentrations at V27

	Flow (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	220	0.0008	1.896	0.014	67.234	0.051	0.327	0.152	0.980	17.667	3.178
Feb	173	0.0009	2.163	0.015	71.973	0.058	0.374	0.175	1.122	20.242	3.563
Mar	185	0.0010	2.533	0.017	78.282	0.068	0.438	0.205	1.317	23.792	3.773
Apr	301	0.0009	2.111	0.015	70.499	0.056	0.364	0.170	1.092	19.698	2.811
May	2006	0.0006	0.444	0.006	41.466	0.010	0.074	0.031	0.209	3.668	1.090
Jun	2048	0.0006	0.537	0.006	43.029	0.013	0.090	0.039	0.258	4.554	1.124
Jul	1445	0.0006	0.627	0.007	44.630	0.015	0.106	0.046	0.306	5.428	1.243
Aug	1020	0.0006	0.647	0.007	45.054	0.016	0.109	0.048	0.317	5.627	1.354
Sep	1358	0.0006	0.521	0.006	42.840	0.012	0.087	0.038	0.250	4.414	1.201
Oct	727	0.0006	0.706	0.007	46.162	0.018	0.120	0.053	0.348	6.198	1.519
Nov	367	0.0007	1.284	0.010	56.320	0.034	0.221	0.101	0.655	11.763	2.230
Dec	299	0.0008	1.581	0.012	61.552	0.042	0.272	0.126	0.812	14.622	2.616

Concentrations at V8

	Flow (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	407	0.0005	1.4372	0.0079	37.9871	0.0382	0.1938	0.1153	0.7483	13.4884	1.7724
Feb	309	0.0005	1.6937	0.0090	42.0660	0.0452	0.2284	0.1363	0.8840	15.9452	2.0504
Mar	324	0.0006	2.0370	0.0105	47.0896	0.0544	0.2747	0.1643	1.0652	19.2249	2.2341
Apr	567	0.0005	1.5744	0.0084	39.2682	0.0417	0.2122	0.1262	0.8201	14.7883	1.5532
May	4337	0.0003	0.2754	0.0026	19.4565	0.0066	0.0369	0.0201	0.1339	2.3651	0.5134
Jun	4448	0.0003	0.3346	0.0029	20.1632	0.0082	0.0449	0.0249	0.1652	2.9325	0.5290
Jul	3119	0.0003	0.3963	0.0031	21.0976	0.0099	0.0533	0.0299	0.1978	3.5236	0.5896
Aug	2191	0.0003	0.4116	0.0032	21.4110	0.0103	0.0554	0.0312	0.2060	3.6718	0.6444
Sep	2933	0.0003	0.3267	0.0029	20.1800	0.0080	0.0439	0.0243	0.1611	2.8579	0.5674
Oct	1549	0.0003	0.4543	0.0034	22.1606	0.0115	0.0612	0.0348	0.2287	4.0831	0.7292
Nov	741	0.0004	0.8847	0.0053	28.8561	0.0232	0.1193	0.0700	0.4563	8.2025	1.1357
Dec	575	0.0004	1.1468	0.0065	33.2373	0.0303	0.1545	0.0914	0.5946	10.7058	1.3999

Grum Vangorda Site

Concentrations Estimates for Vangorda

Loadings: Current Maximum Con

Concentrations at V27

	Flow (x1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	220	59.703	15.403	6.609	0.189	0.027	361.043	41.846
Feb	173	66.855	17.669	7.314	0.216	0.030	412.285	48.005
Mar	185	76.331	20.786	7.594	0.253	0.034	477.823	56.479
Apr	301	64.541	17.176	5.713	0.209	0.028	390.762	46.667
May	2006	20.822	3.083	2.777	0.041	0.008	82.471	8.355
Jun	2048	23.174	3.861	2.806	0.050	0.009	98.623	10.471
Jul	1445	25.589	4.630	3.020	0.059	0.010	115.854	12.561
Aug	1020	26.241	4.807	3.250	0.062	0.011	121.125	13.041
Sep	1358	22.901	3.740	2.980	0.049	0.009	97.384	10.141
Oct	727	27.925	5.311	3.580	0.068	0.012	133.789	14.412
Nov	367	43.236	10.206	4.845	0.127	0.019	242.614	27.717
Dec	299	51.114	12.721	5.540	0.157	0.022	298.699	34.555

Concentrations at V8

	Flow (x1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	407	37.8068	11.7540	3.6307	0.1334	0.0177	244.8358	31.9106
Feb	309	43.8191	13.9066	4.1464	0.1575	0.0207	288.6291	37.7567
Mar	324	51.5362	16.7775	4.4238	0.1891	0.0241	344.0886	45.5544
Apr	567	40.3694	12.8877	3.0993	0.1451	0.0182	262.1482	34.9908
May	4337	10.5678	2.0078	1.2940	0.0243	0.0043	46.5630	5.4417
Jun	4448	11.8428	2.5049	1.3040	0.0297	0.0048	55.9335	6.7918
Jul	3119	13.2703	3.0228	1.4137	0.0355	0.0055	66.3785	8.1985
Aug	2191	13.6911	3.1534	1.5280	0.0371	0.0058	69.6370	8.5530
Sep	2933	11.7469	2.4400	1.3919	0.0291	0.0049	55.3449	6.6155
Oct	1549	14.7557	3.5144	1.6978	0.0412	0.0064	77.5877	9.5334
Nov	741	24.7360	7.1230	2.4315	0.0814	0.0112	150.0665	19.3340
Dec	575	30.9017	9.3149	2.9204	0.1059	0.0142	194.3088	25.2867

Grum Vangorda Site

Concentrations Estimates for Vangorda Creek Catchments

Loadings: Future Worst Conditions

Concentrations at V27

	Flow (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	220	0.0008	5.468	0.014	69.880	0.141	0.410	0.399	2.878	50.198	3.328
Feb	173	0.0009	6.261	0.015	75.008	0.162	0.469	0.457	3.299	57.563	3.734
Mar	185	0.0010	7.356	0.017	81.853	0.190	0.550	0.537	3.879	67.706	3.974
Apr	301	0.0009	6.096	0.015	73.450	0.157	0.456	0.444	3.209	55.982	2.978
May	2006	0.0006	1.156	0.006	41.993	0.028	0.090	0.080	0.587	10.150	1.120
Jun	2048	0.0006	1.429	0.006	43.690	0.035	0.110	0.100	0.732	12.682	1.161
Jul	1445	0.0006	1.699	0.007	45.423	0.042	0.130	0.120	0.875	15.182	1.288
Aug	1020	0.0006	1.760	0.007	45.877	0.044	0.135	0.125	0.908	15.755	1.400
Sep	1358	0.0006	1.386	0.006	43.481	0.034	0.107	0.097	0.709	12.286	1.237
Oct	727	0.0006	1.935	0.007	47.072	0.049	0.148	0.138	1.001	17.391	1.571
Nov	367	0.0007	3.650	0.010	58.072	0.093	0.275	0.264	1.912	33.304	2.329
Dec	299	0.0008	4.531	0.012	63.736	0.116	0.340	0.329	2.379	41.483	2.739
Average		0.0007	3.5606	0.0102		0.0911			1.8640		

Concentrations at V8

	Flow (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	407	0.0005	3.4510	0.0079	39.4404	0.0892	0.2407	0.2531	1.8180	31.7844	1.8548
Feb	309	0.0005	4.0766	0.0090	43.7856	0.1055	0.2839	0.2993	2.1497	37.5940	2.1479
Mar	324	0.0006	4.9123	0.0105	49.1645	0.1271	0.3417	0.3610	2.5924	45.3465	2.3518
Apr	567	0.0005	3.7828	0.0084	40.8619	0.0975	0.2636	0.2773	1.9932	34.8520	1.6436
May	4337	0.0003	0.6183	0.0026	19.7039	0.0153	0.0449	0.0435	0.3160	5.4807	0.5274
Jun	4448	0.0003	0.7628	0.0029	20.4722	0.0190	0.0549	0.0542	0.3926	6.8225	0.5465
Jul	3119	0.0003	0.9133	0.0031	21.4707	0.0229	0.0653	0.0653	0.4724	8.2204	0.6107
Aug	2191	0.0003	0.9509	0.0032	21.8003	0.0240	0.0679	0.0681	0.4925	8.5718	0.6665
Sep	2933	0.0003	0.7437	0.0029	20.4809	0.0186	0.0536	0.0528	0.3826	6.6466	0.5845
Oct	1549	0.0003	1.0555	0.0034	22.5945	0.0267	0.0752	0.0759	0.5481	9.5453	0.7538
Nov	741	0.0004	2.1047	0.0053	29.7365	0.0540	0.1477	0.1535	1.1043	19.2857	1.1857
Dec	575	0.0004	2.7425	0.0065	34.3889	0.0706	0.1917	0.2006	1.4422	25.2030	1.4653

Grum Vangorda Site

Concentrations Estimates for Vangorda

Loadings: Future Worst Condition

Concentrations at V27

	Flow (x1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	220	95.249	43.327	6.705	0.383	0.053	714.840	117.055
Feb	173	107.635	49.705	7.424	0.439	0.060	818.180	134.290
Mar	185	124.314	58.481	7.724	0.514	0.069	955.418	158.006
Apr	301	104.186	48.321	5.820	0.425	0.057	785.366	130.551
May	2006	27.905	8.647	2.796	0.080	0.013	152.971	23.342
Jun	2048	32.055	10.838	2.830	0.099	0.016	187.020	29.262
Jul	1445	36.247	13.002	3.049	0.117	0.018	221.930	35.110
Aug	1020	37.307	13.500	3.280	0.122	0.019	231.265	36.455
Sep	1358	31.502	10.497	3.003	0.096	0.015	182.991	28.339
Oct	727	40.155	14.919	3.613	0.135	0.021	255.520	40.289
Nov	367	66.774	28.696	4.908	0.255	0.036	476.894	77.520
Dec	299	80.464	35.777	5.620	0.317	0.044	590.825	96.654

Average

27.9759

0.2483

0.0350

75.5728

Concentrations at V8

	Flow (x1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	407	57.7277	27.4492	3.6843	0.2410	0.0324	443.1662	74.1720
Feb	309	67.3906	32.4781	4.2098	0.2848	0.0380	523.3050	87.7629
Mar	324	79.9777	39.1860	4.5003	0.3427	0.0450	627.2494	105.8920
Apr	567	62.2150	30.0994	3.1581	0.2630	0.0343	479.6412	81.3355
May	4337	13.9601	4.6805	1.3031	0.0426	0.0068	80.3359	12.6383
Jun	4448	16.0784	5.8419	1.3154	0.0526	0.0080	98.1019	15.7773
Jul	3119	18.3843	7.0520	1.4274	0.0631	0.0093	117.2928	19.0477
Aug	2191	19.0263	7.3569	1.5423	0.0659	0.0097	122.7537	19.8714
Sep	2933	15.8721	5.6902	1.4030	0.0514	0.0079	96.4153	15.3670
Oct	1549	20.7030	8.2002	1.7138	0.0733	0.0108	136.7985	22.1504
Nov	741	36.8035	16.6308	2.4640	0.1466	0.0201	270.2098	44.9349
Dec	575	46.6865	21.7514	2.9628	0.1912	0.0258	351.4604	58.7735

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

Faro Site

Summary Tables

Conditions Base Case Current Loadings

Location	X2	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
	Jan	664	0.0004	0.2578	0.0308	33.8003	0.0042	0.1182	0.0053	0.0526	1.8023
	Feb	486	0.0005	0.2973	0.0370	34.7207	0.0050	0.1427	0.0062	0.0623	2.1143
	Mar	488	0.0005	0.3079	0.0392	35.6437	0.0051	0.1513	0.0065	0.0630	2.1470
	Apr	905	0.0003	0.1730	0.0189	33.4213	0.0022	0.0706	0.0033	0.0270	1.0093
	May	8171	0.0002	0.1053	0.0070	30.3057	0.0010	0.0240	0.0016	0.0148	0.5918
	Jun	8398	0.0002	0.1206	0.0093	30.5259	0.0014	0.0330	0.0019	0.0190	0.7229
	Jul	5839	0.0002	0.1257	0.0101	30.6731	0.0015	0.0363	0.0020	0.0201	0.7611
	Aug	4081	0.0002	0.1330	0.0112	30.7612	0.0016	0.0405	0.0022	0.0222	0.8251
	Sep	5541	0.0002	0.1289	0.0104	30.5809	0.0015	0.0377	0.0021	0.0214	0.7992
	Oct	2897	0.0002	0.1627	0.0155	31.0721	0.0023	0.0578	0.0029	0.0306	1.0894
	Nov	1325	0.0003	0.2135	0.0234	32.2573	0.0033	0.0892	0.0042	0.0431	1.4911
	Dec	980	0.0003	0.2086	0.0232	32.7588	0.0031	0.0880	0.0041	0.0401	1.4046
	Total	39776									
Location	X14	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
	Jan	1140	0.0010	1.8888	0.0297	29.2705	0.0164	0.2829	0.0199	0.5761	30.8908
	Feb	863	0.0013	2.4497	0.0354	28.2214	0.0196	0.3343	0.0246	0.7438	40.7351
	Mar	928	0.0015	2.8668	0.0378	27.6680	0.0224	0.3784	0.0284	0.8730	48.0599
	Apr	1726	0.0009	1.7469	0.0216	29.2376	0.0151	0.2526	0.0181	0.5366	28.7634
	May	14493	0.0002	0.3112	0.0059	29.6915	0.0026	0.0441	0.0034	0.0821	4.2989
	Jun	14907	0.0002	0.3233	0.0074	29.9629	0.0032	0.0567	0.0039	0.0878	4.3641
	Jul	10356	0.0003	0.3798	0.0083	29.9947	0.0038	0.0668	0.0045	0.1060	5.3007
	Aug	7282	0.0003	0.4872	0.0092	29.6328	0.0041	0.0711	0.0052	0.1364	7.2418
	Sep	9800	0.0003	0.3785	0.0083	29.7577	0.0033	0.0586	0.0042	0.1029	5.3548
	Oct	5132	0.0004	0.5977	0.0122	29.5316	0.0049	0.0867	0.0063	0.1690	9.0764
	Nov	2293	0.0006	0.9887	0.0199	30.0479	0.0095	0.1689	0.0112	0.2970	15.4006
	Dec	1659	0.0007	1.2412	0.0222	30.3068	0.0123	0.2165	0.0141	0.3814	19.6169
	Total	70579									
	Average of X2 X14		0.0005	0.6623	0.0189		0.0062			0.1878	

Faro Site

Summary Tables

Conditions Base Case C

Location	X2	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
	Jan	664	1.1057	11.4988	0.2682	3.5085	0.0093	0.0069	45.9539	2.5682
	Feb	486	1.1454	12.5654	0.3174	3.7649	0.0111	0.0080	55.6933	3.0869
	Mar	488	1.1777	13.4112	0.3296	3.8430	0.0119	0.0086	61.8520	3.1781
	Apr	905	1.0714	10.5291	0.1598	2.9785	0.0066	0.0051	33.3865	1.3371
	May	8171	0.9541	7.4287	0.0778	2.5187	0.0027	0.0027	8.6422	0.5591
	Jun	8398	0.9652	7.7289	0.0971	2.6161	0.0033	0.0031	11.6986	0.7696
	Jul	5839	0.9712	7.8901	0.1034	2.6496	0.0035	0.0032	13.1053	0.8346
	Aug	4081	0.9759	8.0195	0.1127	2.6959	0.0038	0.0034	14.4775	0.9365
	Sep	5541	0.9691	7.8386	0.1077	2.6682	0.0036	0.0033	13.0229	0.8888
	Oct	2897	0.9936	8.5066	0.1504	2.8840	0.0049	0.0041	19.8138	1.3551
	Nov	1325	1.0448	9.8800	0.2138	3.2141	0.0071	0.0055	32.3550	2.0230
	Dec	980	1.0595	10.2563	0.2066	3.1899	0.0072	0.0056	34.3576	1.9128
	Total	39776								

Location	X14	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
	Jan	1140	0.9362	11.8993	1.0606	2.6899	0.0197	0.0096	127.5282	11.3009
	Feb	863	0.8996	12.6590	1.2865	2.6608	0.0238	0.0112	159.5650	13.6473
	Mar	928	0.8784	13.3417	1.4790	2.5579	0.0270	0.0123	184.2377	15.7073
	Apr	1726	0.9237	11.2133	0.9803	2.3793	0.0175	0.0083	115.1872	10.4578
	May	14493	0.9301	7.4116	0.1801	2.3743	0.0039	0.0030	18.4357	1.6977
	Jun	14907	0.9427	7.7191	0.2130	2.4423	0.0045	0.0033	21.4967	2.0886
	Jul	10356	0.9448	7.9186	0.2492	2.4551	0.0052	0.0035	25.7103	2.4902
	Aug	7282	0.9314	7.9271	0.2765	2.4400	0.0057	0.0038	30.7529	2.7423
	Sep	9800	0.9356	7.7200	0.2248	2.4495	0.0048	0.0034	24.0781	2.1885
	Oct	5132	0.9310	8.2300	0.3298	2.5199	0.0069	0.0043	38.3668	3.3033
	Nov	2293	0.9590	9.9155	0.6082	2.6914	0.0118	0.0065	70.0268	6.4215
	Dec	1659	0.9702	10.8431	0.7832	2.6757	0.0146	0.0075	89.0707	8.3912
	Total	70579								

Average of X2 X14 0.4090 0.0092 0.0057 4.1619

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

Faro Site

Location	Mouth of Rose Creek		Ag	Al	As	Ca	Cd	Cl	Co	Cu	Fe
	Flows (x1000 m ³)		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan	1576		0.0008	1.3848	0.0218	29.3602	0.0119	0.2047	0.0145	0.4181	22.4227
Feb	1180		0.0010	1.8089	0.0261	28.5906	0.0144	0.2445	0.0182	0.5451	29.8556
Mar	1248		0.0011	2.1482	0.0284	28.1624	0.0167	0.2813	0.0212	0.6501	35.7966
Apr	2344		0.0007	1.3042	0.0161	29.3317	0.0112	0.1862	0.0135	0.3965	21.2571
May	20005		0.0002	0.2436	0.0046	29.6649	0.0020	0.0320	0.0026	0.0607	3.1872
Jun	20576		0.0002	0.2524	0.0057	29.8615	0.0024	0.0411	0.0030	0.0649	3.2344
Jul	14309		0.0002	0.2931	0.0063	29.8843	0.0028	0.0484	0.0034	0.0780	3.9094
Aug	10047		0.0003	0.3713	0.0070	29.6224	0.0030	0.0516	0.0039	0.1001	5.3219
Sep	13522		0.0002	0.2925	0.0063	29.7129	0.0025	0.0425	0.0032	0.0758	3.9538
Oct	7071		0.0003	0.4519	0.0091	29.5490	0.0036	0.0630	0.0048	0.1239	6.6597
Nov	3171		0.0004	0.7331	0.0147	29.9225	0.0069	0.1221	0.0082	0.2160	11.2079
Dec	2306		0.0005	0.9115	0.0162	30.1071	0.0089	0.1559	0.0103	0.2756	14.1883
Total	97354										

Location	Mouth of Anvil Creek		Ag	Al	As	Ca	Cd	Cl	Co	Cu	Fe
	Flows (x1000 m ³)		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan	4380		0.0003	0.5404	0.0085	29.5105	0.0044	0.0738	0.0056	0.1533	8.2362
Feb	3223		0.0004	0.7043	0.0102	29.2271	0.0054	0.0897	0.0070	0.2025	11.1029
Mar	3308		0.0005	0.8513	0.0113	29.0547	0.0064	0.1062	0.0084	0.2480	13.6659
Apr	6316		0.0003	0.5253	0.0066	29.4973	0.0043	0.0692	0.0054	0.1499	8.0533
May	55481		0.0001	0.1300	0.0023	29.6202	0.0008	0.0117	0.0013	0.0248	1.3181
Jun	57067		0.0001	0.1331	0.0027	29.6911	0.0010	0.0150	0.0015	0.0263	1.3351
Jul	39748		0.0001	0.1477	0.0029	29.6991	0.0011	0.0176	0.0016	0.0310	1.5764
Aug	27838		0.0002	0.1761	0.0032	29.6049	0.0012	0.0187	0.0018	0.0390	2.0894
Sep	37472		0.0001	0.1477	0.0029	29.6375	0.0010	0.0155	0.0015	0.0302	1.5955
Oct	19551		0.0002	0.2055	0.0039	29.5784	0.0014	0.0229	0.0021	0.0477	2.5771
Nov	8825		0.0002	0.3057	0.0059	29.7127	0.0026	0.0440	0.0033	0.0805	4.1969
Dec	6470		0.0003	0.3673	0.0064	29.7775	0.0033	0.0557	0.0041	0.1012	5.2276
Total	269678										

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

Faro Site

Location	Mouth of Rose Creek								
	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	1576	0.9320	10.4163	0.7752	2.5725	0.0145	0.0074	92.2683	8.1833
Feb	1180	0.9054	11.0129	0.9483	2.5545	0.0177	0.0087	116.6713	9.9855
Mar	1248	0.8893	11.5955	1.1068	2.4828	0.0203	0.0096	136.9675	11.6837
Apr	2344	0.9230	9.9813	0.7296	2.3493	0.0132	0.0066	84.8496	7.7101
May	20005	0.9276	7.1703	0.1383	2.3443	0.0031	0.0026	13.3569	1.2370
Jun	20576	0.9368	7.3930	0.1621	2.3935	0.0036	0.0028	15.5745	1.5202
Jul	14309	0.9382	7.5366	0.1882	2.4027	0.0040	0.0030	18.6093	1.8094
Aug	10047	0.9285	7.5443	0.2082	2.3919	0.0044	0.0032	22.2923	1.9948
Sep	13522	0.9316	7.3941	0.1707	2.3988	0.0038	0.0029	17.4527	1.5933
Oct	7071	0.9283	7.7654	0.2471	2.4501	0.0053	0.0036	27.8461	2.4044
Nov	3171	0.9485	8.9794	0.4475	2.5734	0.0088	0.0052	50.6312	4.6499
Dec	2306	0.9564	9.6349	0.5714	2.5606	0.0108	0.0059	64.0869	6.0446
Total	97354								

Location	Mouth of Anvil Creek								
	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	4380	0.9250	7.9319	0.2970	2.3758	0.0059	0.0038	33.1982	2.9605
Feb	3223	0.9153	8.1757	0.3653	2.3712	0.0072	0.0043	42.7369	3.6737
Mar	3308	0.9091	8.4441	0.4351	2.3474	0.0084	0.0047	51.6623	4.4227
Apr	6316	0.9218	7.8142	0.2885	2.2965	0.0056	0.0035	31.4847	2.8768
May	55481	0.9235	6.7646	0.0680	2.2938	0.0018	0.0020	4.8185	0.4624
Jun	57067	0.9268	6.8449	0.0765	2.3115	0.0020	0.0021	5.6181	0.5645
Jul	39748	0.9273	6.8961	0.0859	2.3148	0.0022	0.0022	6.7016	0.6678
Aug	27838	0.9238	6.8998	0.0932	2.3110	0.0023	0.0022	8.0477	0.7363
Sep	37472	0.9249	6.8455	0.0797	2.3135	0.0021	0.0021	6.3002	0.5913
Oct	19551	0.9237	6.9805	0.1074	2.3321	0.0026	0.0024	10.0732	0.8859
Nov	8825	0.9310	7.4139	0.1790	2.3760	0.0039	0.0029	18.1974	1.6874
Dec	6470	0.9337	7.6405	0.2219	2.3706	0.0046	0.0032	22.8471	2.1712
Total	269678								

Faro Site

Conditions		Base Case Intermediate Loadings									
Location	X2	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
	Jan	664	0.0007	0.6165	0.1096	37.7550	0.0087	0.2660	0.0132	0.0913	3.9532
	Feb	486	0.0008	0.7326	0.1324	39.5522	0.0104	0.3223	0.0159	0.1094	4.7258
	Mar	488	0.0009	0.7995	0.1441	41.4826	0.0113	0.3572	0.0175	0.1164	5.1047
	Apr	905	0.0006	0.4511	0.0738	37.3187	0.0058	0.1918	0.0096	0.0577	2.6962
	May	8171	0.0002	0.1709	0.0220	30.9431	0.0018	0.0503	0.0030	0.0219	0.9833
	Jun	8398	0.0002	0.2087	0.0297	31.3473	0.0025	0.0681	0.0038	0.0284	1.2479
	Jul	5839	0.0003	0.2252	0.0329	31.6400	0.0027	0.0762	0.0042	0.0308	1.3549
	Aug	4081	0.0003	0.2424	0.0365	31.7966	0.0030	0.0842	0.0046	0.0339	1.4771
	Sep	5541	0.0003	0.2259	0.0334	31.4283	0.0027	0.0759	0.0042	0.0317	1.3755
	Oct	2897	0.0003	0.3097	0.0505	32.3309	0.0041	0.1154	0.0061	0.0463	1.9626
	Nov	1325	0.0005	0.4593	0.0798	34.6453	0.0064	0.1879	0.0096	0.0695	2.9574
	Dec	980	0.0005	0.4772	0.0820	35.7418	0.0065	0.1989	0.0100	0.0692	3.0159
	Total	39776									
Location	X14	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
	Jan	1140	0.0039	8.5270	0.0938	41.1842	0.0338	1.1642	0.0704	2.5393	147.5392
	Feb	863	0.0051	11.2651	0.1135	43.4187	0.0413	1.3791	0.0897	3.3312	196.4870
	Mar	928	0.0060	13.3031	0.1220	45.5270	0.0477	1.5967	0.1048	3.9397	232.8736
	Apr	1726	0.0036	7.9518	0.0674	40.4871	0.0314	1.1174	0.0654	2.3930	138.1945
	May	14493	0.0006	1.1767	0.0168	31.3208	0.0051	0.1724	0.0103	0.3385	19.3456
	Jun	14907	0.0006	1.1885	0.0212	31.7608	0.0061	0.2177	0.0113	0.3483	19.1388
	Jul	10356	0.0007	1.4468	0.0240	32.1864	0.0073	0.2615	0.0136	0.4277	23.5932
	Aug	7282	0.0010	1.9890	0.0275	32.3696	0.0082	0.2749	0.0169	0.5780	33.4571
	Sep	9800	0.0007	1.4649	0.0241	31.8086	0.0065	0.2181	0.0129	0.4224	24.1543
	Oct	5132	0.0012	2.4945	0.0371	32.8853	0.0099	0.3199	0.0208	0.7200	42.2179
	Nov	2293	0.0020	4.2310	0.0612	36.2120	0.0188	0.6615	0.0371	1.2597	71.6886
	Dec	1659	0.0025	5.3953	0.0681	38.3779	0.0246	0.8932	0.0478	1.6306	91.8177
	Total	70579									

Faro Site

Conditions Base Case II

Location X2

	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	664	1.2952	17.0834	0.6769	4.8209	0.0279	0.0159	87.3930	6.5977
Feb	486	1.3772	19.3875	0.8144	5.3722	0.0336	0.0189	106.2671	7.9789
Mar	488	1.4614	21.6483	0.9022	5.8326	0.0377	0.0210	122.3290	8.7136
Apr	905	1.2659	16.0166	0.5013	4.3751	0.0217	0.0125	72.8248	4.4866
May	8171	0.9839	8.3305	0.1500	2.7195	0.0060	0.0043	15.4662	1.2936
Jun	8398	1.0031	8.8916	0.1931	2.8700	0.0077	0.0052	20.5582	1.7550
Jul	5839	1.0163	9.2580	0.2130	2.9543	0.0086	0.0057	23.4565	1.9487
Aug	4081	1.0239	9.4848	0.2322	3.0183	0.0093	0.0061	25.6136	2.1601
Sep	5541	1.0076	9.0395	0.2116	2.9219	0.0084	0.0056	22.2755	1.9713
Oct	2897	1.0506	10.2912	0.3072	3.2569	0.0122	0.0076	33.6142	2.9956
Nov	1325	1.1562	13.2583	0.4843	3.9667	0.0195	0.0115	57.9187	4.7741
Dec	980	1.2026	14.4681	0.5132	4.1825	0.0212	0.0123	65.5782	4.9311
Total	39776								

Location X14

	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	1140	1.2242	22.6272	3.9812	4.5869	0.0674	0.0266	427.8772	26.8977
Feb	863	1.2410	25.6357	4.9055	4.9102	0.0836	0.0324	551.7851	33.2785
Mar	928	1.2757	28.4492	5.7240	5.1864	0.0963	0.0368	647.6156	38.5899
Apr	1726	1.2047	21.5045	3.7926	4.2527	0.0611	0.0236	398.1557	24.9454
May	14493	0.9723	8.9617	0.5889	2.6491	0.0107	0.0054	58.2954	3.8934
Jun	14907	0.9957	9.6104	0.6894	2.7865	0.0124	0.0062	63.0719	4.5972
Jul	10356	1.0087	10.2012	0.8285	2.8721	0.0146	0.0070	76.7792	5.5198
Aug	7282	0.9983	10.4316	0.9470	2.8761	0.0171	0.0079	98.9251	6.4047
Sep	9800	0.9882	9.6725	0.7351	2.7895	0.0137	0.0067	74.0246	4.9966
Oct	5132	1.0079	11.1772	1.1269	3.0162	0.0209	0.0095	123.1738	7.8072
Nov	2293	1.1207	15.8441	2.1641	3.7467	0.0377	0.0159	219.9905	14.7526
Dec	1659	1.1913	18.8117	2.8694	4.1326	0.0478	0.0195	283.6454	19.1989
Total	70579								

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

Faro Site

Location	Mouth of Rose Creek		Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
	Flows (x1000 m ³)										
Jan	1576		0.0028	6.1875	0.0681	37.9799	0.0245	0.8424	0.0511	1.8385	106.8183
Feb	1180		0.0038	8.2545	0.0833	39.7026	0.0302	1.0085	0.0657	2.4369	143.7378
Mar	1248		0.0045	9.9067	0.0910	41.4392	0.0355	1.1871	0.0781	2.9301	173.1913
Apr	2344		0.0027	5.8747	0.0499	37.6183	0.0232	0.8231	0.0483	1.7639	101.8657
May	20005		0.0005	0.8706	0.0124	30.8453	0.0037	0.1250	0.0076	0.2465	14.0878
Jun	20576		0.0005	0.8792	0.0157	31.1641	0.0045	0.1578	0.0084	0.2536	13.9380
Jul	14309		0.0005	1.0653	0.0176	31.4705	0.0053	0.1893	0.0100	0.3108	17.1489
Aug	10047		0.0007	1.4598	0.0202	31.6062	0.0060	0.1993	0.0124	0.4202	24.3240
Sep	13522		0.0006	1.0799	0.0178	31.1994	0.0048	0.1581	0.0095	0.3074	17.5795
Oct	7071		0.0009	1.8285	0.0272	31.9830	0.0072	0.2322	0.0152	0.5238	30.7124
Nov	3171		0.0015	3.0773	0.0445	34.3791	0.0137	0.4783	0.0270	0.9120	51.9048
Dec	2306		0.0018	3.9003	0.0493	35.9143	0.0177	0.6427	0.0345	1.1745	66.1364
Total	97354										

Location	Mouth of Anvil Creek		Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
	Flows (x1000 m ³)										
Jan	4379.86876		0.0011	2.2683	0.0252	32.6117	0.0089	0.3032	0.0188	0.6643	38.5995
Feb	3222.79882		0.0014	3.0652	0.0311	33.2972	0.0112	0.3695	0.0245	0.8954	52.8158
Mar	3308.43178		0.0018	3.7775	0.0349	34.0623	0.0135	0.4478	0.0298	1.1079	65.4869
Apr	6316.47276		0.0010	2.2212	0.0191	32.5719	0.0087	0.3055	0.0183	0.6573	37.9621
May	55480.8489		0.0002	0.3560	0.0051	30.0458	0.0015	0.0452	0.0031	0.0918	5.2485
Jun	57066.8813		0.0002	0.3591	0.0063	30.1608	0.0017	0.0570	0.0034	0.0943	5.1945
Jul	39747.5099		0.0003	0.4257	0.0070	30.2702	0.0020	0.0683	0.0040	0.1148	6.3425
Aug	27837.7949		0.0003	0.5690	0.0079	30.3208	0.0023	0.0721	0.0049	0.1545	8.9473
Sep	37471.6581		0.0003	0.4318	0.0071	30.1740	0.0018	0.0572	0.0038	0.1138	6.5124
Oct	19551.3515		0.0004	0.7034	0.0105	30.4586	0.0027	0.0841	0.0059	0.1923	11.2761
Nov	8824.71669		0.0006	1.1481	0.0166	31.3142	0.0050	0.1720	0.0101	0.3306	18.8219
Dec	6469.98667		0.0007	1.4327	0.0182	31.8476	0.0065	0.2292	0.0127	0.4215	23.7451
Total	269678.32										

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

Faro Site

Location	Mouth of Rose Creek									
	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L	
Jan	1576	1.1404	18.1780	2.8883	3.9450	0.0490	0.0197	309.5723	19.4677	
Feb	1180	1.1550	20.5012	3.5944	4.1992	0.0614	0.0242	403.4538	24.3393	
Mar	1248	1.1847	22.8267	4.2626	4.4369	0.0719	0.0278	481.4533	28.6952	
Apr	2344	1.1300	17.5619	2.8011	3.7292	0.0453	0.0178	293.2883	18.3819	
May	20005	0.9582	8.2932	0.4344	2.5434	0.0081	0.0044	42.2335	2.8276	
Jun	20576	0.9751	8.7632	0.5073	2.6429	0.0093	0.0049	45.6938	3.3375	
Jul	14309	0.9845	9.1887	0.6075	2.7045	0.0109	0.0055	55.5711	4.0021	
Aug	10047	0.9771	9.3596	0.6942	2.7081	0.0127	0.0062	71.7068	4.6495	
Sep	13522	0.9697	8.8093	0.5406	2.6452	0.0102	0.0053	53.6535	3.6286	
Oct	7071	0.9841	9.9044	0.8256	2.8103	0.0155	0.0073	89.3954	5.6732	
Nov	3171	1.0654	13.2658	1.5725	3.3363	0.0276	0.0120	159.0566	10.6734	
Dec	2306	1.1155	15.3682	2.0724	3.6088	0.0347	0.0145	204.0823	13.8206	
Total	97354									

Location	Mouth of Anvil Creek									
	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L	
Jan	4379.86876	1.0000	10.7244	1.0572	2.8696	0.0184	0.0082	111.3784	7.0204	
Feb	3222.79882	1.0068	11.6511	1.3345	2.9736	0.0232	0.0099	147.7799	8.9313	
Mar	3308.43178	1.0205	12.6802	1.6253	3.0844	0.0278	0.0115	181.5916	10.8389	
Apr	6316.47276	0.9986	10.6269	1.0571	2.8085	0.0175	0.0077	108.8232	6.8365	
May	55480.8489	0.9345	7.1695	0.1747	2.3656	0.0036	0.0027	15.2305	1.0359	
Jun	57066.8813	0.9406	7.3389	0.2010	2.4014	0.0041	0.0029	16.4782	1.2198	
Jul	39747.5099	0.9439	7.4908	0.2368	2.4234	0.0046	0.0031	20.0075	1.4571	
Aug	27837.7949	0.9413	7.5549	0.2686	2.4251	0.0053	0.0033	25.8812	1.6944	
Sep	37471.6581	0.9387	7.3562	0.2132	2.4024	0.0044	0.0030	19.3633	1.3257	
Oct	19551.3515	0.9439	7.7541	0.3166	2.4624	0.0063	0.0037	32.3332	2.0681	
Nov	8824.71669	0.9730	8.9543	0.5832	2.6502	0.0106	0.0054	57.1615	3.8520	
Dec	6469.98667	0.9904	9.6842	0.7570	2.7442	0.0131	0.0063	72.7503	4.9430	
Total	269678.32									

Faro Site

Conditions		Base Case Future Worst Loadings									
Location	X2	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
	Jan	664	0.0031	6.7093	0.4908	40.5864	0.1259	4.4027	0.1423	2.3626	86.0138
	Feb	486	0.0038	8.1744	0.5984	42.9911	0.1536	5.3740	0.1735	2.8829	104.9378
	Mar	488	0.0046	9.7707	0.7102	45.3920	0.1836	6.4354	0.2074	3.4527	125.6967
	Apr	905	0.0031	6.4071	0.4559	39.5711	0.1198	4.2101	0.1356	2.2621	82.4449
	May	8171	0.0006	1.1580	0.0828	31.4552	0.0209	0.7231	0.0239	0.3914	14.3258
	Jun	8398	0.0007	1.4829	0.1078	32.0326	0.0271	0.9379	0.0309	0.5062	18.4940
	Jul	5839	0.0008	1.7225	0.1251	32.4166	0.0316	1.0968	0.0360	0.5914	21.5942
	Aug	4081	0.0009	1.8474	0.1349	32.6483	0.0340	1.1792	0.0386	0.6354	23.1905
	Sep	5541	0.0008	1.5443	0.1134	32.1784	0.0282	0.9779	0.0322	0.5274	19.2580
	Oct	2897	0.0011	2.2702	0.1690	33.4665	0.0420	1.4577	0.0477	0.7840	28.5722
	Nov	1325	0.0019	4.1570	0.3075	36.5631	0.0777	2.7084	0.0879	1.4540	52.9418
	Dec	980	0.0024	5.0716	0.3697	37.8636	0.0949	3.3176	0.1073	1.7814	64.8834
	Total	39776									
Location	X14	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
	Jan	1140	0.0068	15.8207	0.5275	43.2823	0.1618	6.0415	0.2176	5.2716	247.9915
	Feb	863	0.0086	19.9636	0.6274	45.9597	0.1930	7.1533	0.2643	6.5831	316.5724
	Mar	928	0.0100	23.3337	0.7157	48.3031	0.2220	8.2416	0.3058	7.6856	371.3370
	Apr	1726	0.0063	14.8203	0.4809	42.0890	0.1514	5.7107	0.2039	4.9614	232.5523
	May	14493	0.0010	2.2616	0.0812	31.6669	0.0243	0.9039	0.0323	0.7464	34.2724
	Jun	14907	0.0011	2.5499	0.1027	32.2021	0.0305	1.1460	0.0392	0.8619	37.8080
	Jul	10356	0.0014	3.0763	0.1217	32.6927	0.0365	1.3711	0.0469	1.0419	45.9370
	Aug	7282	0.0017	3.7324	0.1304	32.9475	0.0391	1.4452	0.0522	1.2328	57.4900
	Sep	9800	0.0013	2.8546	0.1061	32.3043	0.0313	1.1563	0.0412	0.9457	43.2994
	Oct	5132	0.0020	4.5589	0.1575	33.6542	0.0464	1.7003	0.0625	1.4955	70.7605
	Nov	2293	0.0036	8.3909	0.3086	37.5341	0.0928	3.4696	0.1217	2.8240	128.8972
	Dec	1659	0.0047	10.9252	0.4006	39.9052	0.1227	4.6325	0.1602	3.7083	167.6834
	Total	70579									
Average of X2 X14			0.0030	6.7751	0.3094		0.0871			2.2912	

Faro Site

Conditions		Base Case F								
Location	X2	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
	Jan	664	2.0246	34.9805	12.0782	5.0566	0.1209	0.0400	505.7505	90.8174
	Feb	486	2.2670	41.2219	14.7370	5.6518	0.1473	0.0484	617.0154	110.8364
	Mar	488	2.5205	47.6614	17.6493	6.0696	0.1752	0.0569	735.1433	132.5942
	Apr	905	1.9494	32.8383	11.5662	4.3868	0.1137	0.0368	475.4596	86.5632
	May	8171	1.1051	11.2996	2.0054	2.7804	0.0210	0.0081	83.8961	14.9634
	Jun	8398	1.1610	12.7562	2.5919	2.9588	0.0270	0.0101	109.1934	19.4134
	Jul	5839	1.2002	13.7617	3.0273	3.0465	0.0313	0.0115	127.2573	22.6845
	Aug	4081	1.2221	14.3377	3.2522	3.1253	0.0336	0.0123	137.1207	24.3978
	Sep	5541	1.1733	13.0920	2.7002	3.0312	0.0283	0.0106	114.4932	20.2632
	Oct	2897	1.2981	16.3435	4.0108	3.4279	0.0417	0.0150	170.9888	30.2054
	Nov	1325	1.6103	24.3808	7.4348	4.1943	0.0756	0.0258	314.2703	55.9849
	Dec	980	1.7519	27.9466	9.1086	4.3546	0.0913	0.0305	380.8877	68.4324
	Total	39776								
Location	X14	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
	Jan	1140	1.9766	41.4515	17.1362	4.4786	0.1740	0.0543	896.2091	119.4272
	Feb	863	2.1310	47.9211	20.4890	4.7763	0.2100	0.0653	1,108.4790	142.8877
	Mar	928	2.2906	53.8935	23.6477	4.9684	0.2421	0.0748	1,286.9162	164.5993
	Apr	1726	1.8932	38.7807	16.1532	4.0114	0.1621	0.0500	834.5719	111.7519
	May	14493	1.0873	11.8325	2.5634	2.6484	0.0266	0.0095	128.7053	17.7963
	Jun	14907	1.1428	13.2734	3.1942	2.7929	0.0325	0.0113	152.0800	22.2403
	Jul	10356	1.1832	14.5517	3.8211	2.8709	0.0387	0.0132	182.9683	26.5906
	Aug	7282	1.1833	15.0456	4.1085	2.8807	0.0425	0.0144	212.0606	28.6717
	Sep	9800	1.1387	13.4199	3.2716	2.8087	0.0340	0.0119	164.9353	22.8761
	Oct	5132	1.2303	16.7172	4.8635	3.0508	0.0509	0.0171	257.9002	34.1539
	Nov	2293	1.5625	26.8639	9.7437	3.7437	0.0987	0.0316	490.0983	68.1213
	Dec	1659	1.7676	33.2132	12.9438	4.0455	0.1294	0.0406	640.2005	90.0525
	Total	70579								
Average of X2 X14					8.8374		0.0895	0.0292		63.5969

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

Faro Site

Location	Mouth of Rose Creek										
	Flows (x1000 m ³)		Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	1576		0.0049	11.4646	0.3819	39.4978	0.1171	4.3711	0.1576	3.8153	179.4960
Feb	1180		0.0063	14.6146	0.4590	41.5605	0.1411	5.2304	0.1934	4.8147	231.5416
Mar	1248		0.0075	17.3637	0.5323	43.5030	0.1651	6.1271	0.2275	5.7148	276.1282
Apr	2344		0.0047	10.9342	0.3545	38.7983	0.1116	4.2067	0.1503	3.6558	171.3710
May	20005		0.0008	1.6566	0.0591	31.0960	0.0177	0.6549	0.0236	0.5420	24.9017
Jun	20576		0.0008	1.8654	0.0747	31.4837	0.0222	0.8303	0.0286	0.6256	27.4630
Jul	14309		0.0010	2.2447	0.0884	31.8370	0.0264	0.9924	0.0341	0.7554	33.3206
Aug	10047		0.0012	2.7236	0.0948	32.0250	0.0284	1.0476	0.0380	0.8949	41.7442
Sep	13522		0.0010	2.0871	0.0771	31.5587	0.0227	0.8381	0.0300	0.6867	31.4557
Oct	7071		0.0015	3.3267	0.1146	32.5410	0.0337	1.2341	0.0455	1.0866	51.4274
Nov	3171		0.0026	6.0850	0.2234	35.3351	0.0671	2.5086	0.0882	2.0430	93.2672
Dec	2306		0.0034	7.8791	0.2885	37.0131	0.0883	3.3331	0.1155	2.6693	120.7213
Total	97354										

Location	Mouth of Anvil Creek										
	Flows (x1000 m ³)		Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	4380		0.0018	4.1669	0.1380	33.1578	0.0423	1.5727	0.0571	1.3755	64.7471
Feb	3223		0.0024	5.3948	0.1688	33.9777	0.0518	1.9159	0.0712	1.7664	84.9767
Mar	3308		0.0029	6.5901	0.2014	34.8407	0.0624	2.3111	0.0862	2.1582	104.3115
Apr	6316		0.0018	4.0984	0.1322	33.0098	0.0415	1.5610	0.0562	1.3593	63.7511
May	55481		0.0003	0.6394	0.0220	30.1362	0.0065	0.2363	0.0089	0.1983	9.1476
Jun	57067		0.0004	0.7147	0.0276	30.2760	0.0081	0.2995	0.0107	0.2285	10.0712
Jul	39748		0.0004	0.8503	0.0325	30.4021	0.0096	0.3574	0.0127	0.2748	12.1641
Aug	27838		0.0005	1.0251	0.0349	30.4720	0.0104	0.3782	0.0141	0.3258	15.2342
Sep	37472		0.0004	0.7953	0.0285	30.3036	0.0083	0.3026	0.0112	0.2507	11.5196
Oct	19551		0.0006	1.2452	0.0421	30.6604	0.0123	0.4464	0.0168	0.3959	18.7678
Nov	8825		0.0010	2.2289	0.0809	31.6578	0.0243	0.9016	0.0321	0.7371	33.6860
Dec	6470		0.0013	2.8510	0.1035	32.2393	0.0316	1.1883	0.0415	0.9544	43.2027
Total	269678										

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

Faro Site

Location	Mouth of Rose Creek									
	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L	
Jan	1576	1.6848	31.7974	12.4059	3.8666	0.1262	0.0397	648.4126	86.4132	
Feb	1180	1.8057	36.7958	14.9887	4.1013	0.1539	0.0482	810.4958	104.4831	
Mar	1248	1.9392	41.7426	17.5875	4.2748	0.1803	0.0560	956.7240	122.3735	
Apr	2344	1.6372	30.2879	11.9061	3.5515	0.1197	0.0373	614.7589	82.3248	
May	20005	1.0415	10.3730	1.8649	2.5428	0.0196	0.0074	93.2425	12.8997	
Jun	20576	1.0817	11.4169	2.3219	2.6475	0.0239	0.0087	110.1763	16.1192	
Jul	14309	1.1108	12.3374	2.7734	2.7036	0.0283	0.0100	132.4271	19.2524	
Aug	10047	1.1112	12.7041	2.9858	2.7114	0.0311	0.0109	153.7130	20.7897	
Sep	13522	1.0788	11.5253	2.3790	2.6591	0.0249	0.0091	119.5448	16.5874	
Oct	7071	1.1455	13.9250	3.5375	2.8354	0.0372	0.0129	187.1741	24.7945	
Nov	3171	1.3849	21.2332	7.0526	3.3342	0.0717	0.0233	354.3475	49.2595	
Dec	2306	1.5301	25.7300	9.3209	3.5462	0.0934	0.0297	460.6215	64.7994	
Total	97354									

Location	Mouth of Anvil Creek									
	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L	
Jan	4380	1.1959	15.6243	4.4814	2.8414	0.0461	0.0154	233.2843	31.1056	
Feb	3223	1.2451	17.6195	5.5080	2.9378	0.0571	0.0187	296.8717	38.2864	
Mar	3308	1.3051	19.8147	6.6511	3.0232	0.0687	0.0222	360.8490	46.1714	
Apr	6316	1.1868	15.3487	4.4354	2.7425	0.0451	0.0149	228.1007	30.5617	
May	55481	0.9645	7.9194	0.6905	2.3654	0.0078	0.0037	33.6227	4.6676	
Jun	57067	0.9790	8.2958	0.8553	2.4031	0.0093	0.0042	39.7285	5.8284	
Jul	39748	0.9894	8.6243	1.0165	2.4231	0.0109	0.0047	47.6750	6.9471	
Aug	27838	0.9897	8.7619	1.0957	2.4263	0.0119	0.0050	55.4771	7.5193	
Sep	37472	0.9780	8.3363	0.8766	2.4074	0.0097	0.0044	43.1401	6.0019	
Oct	19551	1.0023	9.2082	1.2974	2.4715	0.0142	0.0057	67.6959	8.9835	
Nov	8825	1.0878	11.8175	2.5526	2.6494	0.0265	0.0095	127.3418	17.7185	
Dec	6470	1.1382	13.3778	3.3408	2.7219	0.0340	0.0117	164.1971	23.1151	
Total	269678									

Pelly River

Current Average - Base Case

Pelly River above Vangorda Creek

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	
Jan	83752		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Feb	60765		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Mar	57864		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Apr	71821		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
May	1152643		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Jun	1755415		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Jul	990512		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Aug	672737		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Sep	621684		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Oct	456449		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Nov	186178		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Dec	119473		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
		0.0001		0	0.000577		0.0005			0.004984	

Total Flow at 09BC004 (Pelly River below Vangorda Creek)

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	84121	2.30373E-06	0.000991	0.000612	35.04981	0.000578	0.329711	0.00124	0.005571	0.037113
Feb	61038	2.6487E-06	0.001192	0.00062	35.07081	0.000597	0.329806	0.001298	0.005708	0.040788
Mar	58148	3.29224E-06	0.001545	0.000632	35.09772	0.000628	0.329889	0.001395	0.005942	0.047056
Apr	72369	3.99359E-06	0.001743	0.000638	35.04572	0.000636	0.329078	0.001424	0.006022	0.04921
May	1157010	9.81382E-07	0.000246	0.000584	34.97796	0.000509	0.329451	0.00103	0.005069	0.023692
Jun	1759945	6.87384E-07	0.000183	0.000582	34.99849	0.000508	0.329831	0.001025	0.005054	0.023296
Jul	993679	8.88192E-07	0.000251	0.000585	34.99116	0.000512	0.329661	0.001039	0.005087	0.024185
Aug	674953	9.23226E-07	0.000264	0.000585	34.99079	0.000513	0.329637	0.001042	0.005095	0.024391
Sep	624644	1.26705E-06	0.000335	0.000587	34.96458	0.000514	0.329173	0.001046	0.005111	0.024807
Oct	457989	9.84044E-07	0.000292	0.000586	34.99286	0.000515	0.329626	0.001049	0.005112	0.024845
Nov	186893	1.47168E-06	0.000547	0.000596	35.01013	0.000538	0.329627	0.001118	0.005278	0.0293
Dec	120006	2.03215E-06	0.000815	0.000605	35.02753	0.00056	0.329578	0.001188	0.005447	0.033794

Pelly River

Current Average - Base Case

Pelly River above Vangorda Cre

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	83752	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Feb	60765	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Mar	57864	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Apr	71821	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
May	1152643	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Jun	1755415	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Jul	990512	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Aug	672737	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Sep	621684	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Oct	456449	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Nov	186178	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Dec	119473	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
				0.014		0.001	0.004262		0.008364

Total Flow at 09BC004 (Pelly Riv

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	84121	0.011917	10.5178	0.036201	1.517547	0.001332	0.004299	33.18415	0.074028
Feb	61038	0.013506	10.53901	0.041491	1.520493	0.001411	0.004311	33.34395	0.089656
Mar	58148	0.015197	10.57151	0.050483	1.522955	0.001541	0.004326	33.59212	0.116231
Apr	72369	0.01478	10.56312	0.053353	1.518325	0.00158	0.004319	33.5772	0.124774
May	1157010	0.006051	10.44175	0.016906	1.506971	0.001047	0.004258	32.60836	0.017024
Jun	1759945	0.005487	10.44608	0.016449	1.507256	0.001038	0.00426	32.62432	0.015652
Jul	993679	0.005948	10.44751	0.017678	1.507396	0.001057	0.004261	32.64483	0.019293
Aug	674953	0.006177	10.44836	0.017969	1.507754	0.001062	0.004262	32.65308	0.020155
Sep	624644	0.006724	10.44236	0.018433	1.507104	0.00107	0.004259	32.62924	0.021556
Oct	457989	0.006525	10.45096	0.018614	1.508376	0.001072	0.004263	32.67301	0.022062
Nov	186893	0.008297	10.47404	0.024997	1.511162	0.001166	0.004275	32.85279	0.040925
Dec	120006	0.010239	10.49737	0.031401	1.51418	0.001261	0.004288	33.03108	0.059853

Pelly River

Pelly R upstream of Anvil Creek

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	84549	2.29206E-06	0.000986	0.000612	35.04976	0.000577	0.329715	0.001239	0.005568	0.037034
Feb	61350	2.63523E-06	0.001186	0.00062	35.07065	0.000596	0.32981	0.001296	0.005704	0.040689
Mar	58463	3.27451E-06	0.001536	0.000632	35.0974	0.000627	0.329893	0.001393	0.005937	0.046919
Apr	72976	3.96037E-06	0.001729	0.000637	35.04568	0.000635	0.329091	0.00142	0.006013	0.048979
May	1162431	9.76806E-07	0.000244	0.000584	34.97825	0.000509	0.329456	0.00103	0.005069	0.023681
Jun	1765521	6.85213E-07	0.000183	0.000582	34.99862	0.000508	0.329834	0.001025	0.005054	0.02329
Jul	997566	8.84731E-07	0.00025	0.000585	34.99135	0.000512	0.329665	0.001038	0.005087	0.024174
Aug	677671	9.19522E-07	0.000263	0.000585	34.99099	0.000513	0.329641	0.001042	0.005094	0.024379
Sep	628304	1.25967E-06	0.000334	0.000587	34.96501	0.000514	0.329181	0.001046	0.00511	0.024787
Oct	459896	9.79963E-07	0.000291	0.000586	34.99305	0.000515	0.32963	0.001049	0.005111	0.02483
Nov	187757	1.46491E-06	0.000545	0.000596	35.01026	0.000538	0.329631	0.001117	0.005277	0.029264
Dec	120642	2.02143E-06	0.000811	0.000605	35.0276	0.00056	0.329584	0.001187	0.005445	0.033728

Total Flow in Pelly River just below Anvil Creek

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	88929	1.88683E-05	0.027553	0.000999	34.77695	0.000766	0.317111	0.001454	0.012844	0.440853
Feb	64573	2.33685E-05	0.036278	0.001098	34.77901	0.000835	0.317825	0.001582	0.015527	0.592794
Mar	61771	2.91723E-05	0.047048	0.001204	34.77376	0.000938	0.317914	0.001767	0.018903	0.776344
Apr	79293	2.94392E-05	0.04344	0.001114	34.60369	0.000924	0.308387	0.001737	0.017478	0.686605
May	1217912	7.01223E-06	0.006154	0.000662	34.73417	0.000524	0.31498	0.001043	0.005966	0.082645
Jun	1822588	4.93712E-06	0.004346	0.000648	34.83244	0.000523	0.319975	0.001039	0.005718	0.064363
Jul	1037313	6.35891E-06	0.005899	0.000674	34.78857	0.000536	0.317706	0.001061	0.006078	0.083651
Aug	705509	7.092E-06	0.007202	0.000687	34.77847	0.000541	0.317373	0.001072	0.006432	0.105862
Sep	665776	9.28437E-06	0.008626	0.000717	34.66517	0.000543	0.311524	0.001074	0.006524	0.113193
Oct	479448	8.02082E-06	0.008658	0.000723	34.77225	0.000553	0.317122	0.001092	0.006847	0.12891
Nov	196581	1.1524E-05	0.014242	0.000834	34.77245	0.000631	0.31681	0.001218	0.008654	0.216353
Dec	127112	1.48646E-05	0.019467	0.000902	34.76037	0.0007	0.315642	0.001333	0.010316	0.298094

Pelly River

Pelly R upstream of Anvil Creek

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	84549	0.011879	10.51746	0.036089	1.517499	0.001331	0.004299	33.18129	0.073696
Feb	61350	0.013459	10.53857	0.041351	1.520429	0.001409	0.00431	33.34027	0.089243
Mar	58463	0.015138	10.57086	0.050287	1.522874	0.001538	0.004326	33.58688	0.11565
Apr	72976	0.014693	10.56219	0.053026	1.518239	0.001575	0.004319	33.56924	0.123806
May	1162431	0.006043	10.44179	0.016893	1.506976	0.001046	0.004258	32.60842	0.016984
Jun	1765521	0.005484	10.44609	0.016442	1.507259	0.001038	0.00426	32.6243	0.015629
Jul	997566	0.005942	10.44752	0.017663	1.507398	0.001057	0.004261	32.64473	0.019251
Aug	677671	0.006169	10.44837	0.017953	1.507755	0.001061	0.004262	32.65295	0.020108
Sep	628304	0.00671	10.44241	0.018408	1.507109	0.00107	0.004259	32.62919	0.021479
Oct	459896	0.006516	10.45096	0.018595	1.508374	0.001071	0.004263	32.67279	0.022005
Nov	187757	0.008279	10.47394	0.024946	1.511148	0.001165	0.004275	32.85171	0.040775
Dec	120642	0.010208	10.49713	0.03131	1.514147	0.001259	0.004288	33.02891	0.059582

Total Flow in Pelly River just bel

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	88929	0.056852	10.39012	0.048939	1.559772	0.001558	0.004272	33.18213	0.215876
Feb	64573	0.058472	10.42064	0.057518	1.562891	0.001697	0.004307	33.80925	0.26814
Mar	61771	0.063019	10.45696	0.070896	1.567033	0.001903	0.004345	34.55499	0.346333
Apr	79293	0.086955	10.34328	0.071783	1.580232	0.001895	0.004254	33.40319	0.343112
May	1217912	0.047835	10.27428	0.019219	1.542818	0.001082	0.004157	31.34247	0.037274
Jun	1822588	0.034329	10.33334	0.018324	1.532441	0.001068	0.004193	31.77871	0.032815
Jul	1037313	0.041245	10.31144	0.020276	1.538335	0.001099	0.004181	31.65065	0.0441
Aug	705509	0.042377	10.30835	0.020923	1.53945	0.00111	0.004182	31.68208	0.048366
Sep	665776	0.058388	10.23997	0.021857	1.552494	0.001126	0.00414	31.14732	0.053549
Oct	479448	0.043917	10.30944	0.022218	1.541966	0.001134	0.004187	31.7512	0.057235
Nov	196581	0.049699	10.33657	0.03186	1.549973	0.001287	0.004216	32.19387	0.114693
Dec	127112	0.057213	10.35173	0.041011	1.557739	0.001427	0.004232	32.51066	0.167061

Pelly River

At 09BC001 (Pelly River at Pelly Crossing)

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	184810	9.07927E-06	0.013258	0.00078	34.91342	0.000628	0.324115	0.001219	0.008766	0.223257
Feb	135464	1.11393E-05	0.017293	0.000825	34.91559	0.00066	0.324517	0.001278	0.010009	0.293792
Mar	133384	1.35099E-05	0.021788	0.000867	34.9167	0.000703	0.324731	0.001355	0.01143	0.371039
Apr	169517	1.37703E-05	0.020319	0.000828	34.83591	0.000699	0.320216	0.001345	0.010828	0.332574
May	2070403	4.12493E-06	0.00362	0.000627	34.8601	0.000514	0.321417	0.001026	0.005561	0.057443
Jun	3473280	2.59073E-06	0.00228	0.000614	34.93108	0.000512	0.32503	0.00102	0.005369	0.043963
Jul	1990051	3.31458E-06	0.003075	0.000627	34.90894	0.000519	0.323885	0.001032	0.005554	0.053866
Aug	1352592	3.69917E-06	0.003756	0.000634	34.90358	0.000521	0.323707	0.001037	0.005739	0.065473
Sep	1192320	5.18427E-06	0.004816	0.000655	34.8307	0.000524	0.319954	0.001041	0.005844	0.072673
Oct	875837	4.39073E-06	0.00474	0.000657	34.89343	0.000529	0.323228	0.00105	0.006004	0.08027
Nov	388800	5.82667E-06	0.007201	0.000707	34.90472	0.000566	0.323634	0.00111	0.006839	0.119989
Dec	265697	7.11136E-06	0.009313	0.000732	34.90622	0.000596	0.32345	0.00116	0.007535	0.153792
		6.97844E-06	0.009288	0.000713		0.000581			0.007456	

Condition: Current Maximum - Base Case

Location: Pelly River above Vangorda Creek

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	
Jan	83752		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Feb	60765		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Mar	57864		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Apr	71821		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
May	1152643		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Jun	1755415		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Jul	990512		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Aug	672737		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Sep	621684		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Oct	456449		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Nov	186178		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Dec	119473		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438

Pelly River

At 09BC001 (Pelly River at Pelly

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	184810	0.029568	10.42162	0.030812	1.532912	0.001268	0.004267	32.89049	0.108217
Feb	135464	0.030103	10.43645	0.034744	1.534166	0.001332	0.004284	33.18689	0.132194
Mar	133384	0.031473	10.45368	0.040349	1.535338	0.001418	0.004301	33.51611	0.164879
Apr	169517	0.042942	10.40053	0.041029	1.541787	0.001418	0.004258	32.98634	0.164944
May	2070403	0.029894	10.34698	0.01707	1.528481	0.001048	0.0042	31.8685	0.02537
Jun	3473280	0.02004	10.38918	0.016269	1.520825	0.001036	0.004226	32.17854	0.021194
Jul	1990051	0.02354	10.37818	0.017272	1.523812	0.001051	0.00422	32.11473	0.026991
Aug	1352592	0.024143	10.37652	0.017611	1.524404	0.001058	0.00422	32.13078	0.029229
Sep	1192320	0.034485	10.3331	0.018387	1.532845	0.00107	0.004194	31.79768	0.033595
Oct	875837	0.02597	10.37344	0.018499	1.526594	0.001073	0.004221	32.14441	0.035117
Nov	388800	0.027235	10.39307	0.02303	1.529222	0.001145	0.004239	32.40454	0.062125
Dec	265697	0.029594	10.40343	0.026922	1.531795	0.001204	0.004248	32.56769	0.084286
				0.025166		0.001177	0.00424		0.074012

Current Maximum - Base Case

Pelly River above Vangorda Cre

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	83752	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Feb	60765	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Mar	57864	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Apr	71821	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
May	1152643	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Jun	1755415	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Jul	990512	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Aug	672737	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Sep	621684	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Oct	456449	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Nov	186178	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Dec	119473	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364

Pelly River**Total Flow at 09BC004 (Pelly River below Vangorda Creek)**

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	84121	2.30373E-06	0.006958	0.000612	35.07035	0.000683	0.330101	0.001554	0.008585	0.086648
Feb	61038	2.6487E-06	0.00858	0.00062	35.09624	0.000727	0.330289	0.001686	0.009439	0.102112
Mar	58148	3.29224E-06	0.011348	0.000632	35.13146	0.000801	0.33053	0.00191	0.010893	0.128434
Apr	72369	3.99359E-06	0.012324	0.000638	35.08214	0.000822	0.329771	0.00198	0.011366	0.137042
May	1157010	9.81382E-07	0.001032	0.000584	34.98067	0.000523	0.329503	0.001071	0.005467	0.030223
Jun	1759945	6.87384E-07	0.000846	0.000582	35.00077	0.000519	0.329875	0.00106	0.005388	0.028794
Jul	993679	8.88192E-07	0.001244	0.000585	34.99458	0.000529	0.329726	0.001091	0.005589	0.03243
Aug	674953	9.23226E-07	0.001336	0.000585	34.99448	0.000532	0.329707	0.001098	0.005636	0.033285
Sep	624644	1.26705E-06	0.001534	0.000587	34.9687	0.000535	0.329251	0.001109	0.005716	0.034757
Oct	457989	9.84044E-07	0.001537	0.000586	34.99714	0.000537	0.329708	0.001114	0.005741	0.035177
Nov	186893	1.47168E-06	0.003506	0.000596	35.02031	0.00059	0.32982	0.001274	0.006773	0.053863
Dec	120006	2.03215E-06	0.005495	0.000605	35.04363	0.000643	0.329884	0.001434	0.00781	0.072636

Pelly R upstream of Anvil Creek

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	84549	2.29206E-06	0.006923	0.000612	35.0702	0.000682	0.330104	0.001551	0.008566	0.086318
Feb	61350	2.63523E-06	0.008536	0.00062	35.09595	0.000726	0.330291	0.001683	0.009417	0.101702
Mar	58463	3.27451E-06	0.011287	0.000632	35.13097	0.000799	0.330531	0.001905	0.010862	0.127858
Apr	72976	3.96037E-06	0.012222	0.000637	35.08179	0.00082	0.329778	0.001972	0.011313	0.13608
May	1162431	9.76806E-07	0.001028	0.000584	34.98095	0.000523	0.329508	0.001071	0.005464	0.030182
Jun	1765521	6.85213E-07	0.000843	0.000582	35.00089	0.000519	0.329877	0.00106	0.005387	0.02877
Jul	997566	8.84731E-07	0.001239	0.000585	34.99476	0.000529	0.32973	0.00109	0.005586	0.032387
Aug	677671	9.19522E-07	0.001331	0.000585	34.99466	0.000532	0.32971	0.001098	0.005633	0.033238
Sep	628304	1.25967E-06	0.001525	0.000587	34.96912	0.000535	0.329259	0.001109	0.005712	0.034679
Oct	459896	9.79963E-07	0.00153	0.000586	34.99732	0.000537	0.329711	0.001114	0.005737	0.03512
Nov	187757	1.46491E-06	0.00349	0.000596	35.0204	0.000589	0.329824	0.001272	0.006765	0.053714
Dec	120642	2.02143E-06	0.005466	0.000605	35.04362	0.000642	0.329888	0.001431	0.007795	0.072366

Pelly River

Total Flow at 09BC004 (Pelly Riv

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	84121	0.012825	10.58809	0.070846	1.518969	0.001641	0.004329	33.66242	0.162823
Feb	61038	0.014629	10.62603	0.084381	1.522253	0.001793	0.004348	33.93605	0.199584
Mar	58148	0.016688	10.68699	0.107399	1.525291	0.002049	0.004376	34.37783	0.262104
Apr	72369	0.016389	10.68776	0.114782	1.520847	0.002128	0.004373	34.42523	0.282218
May	1157010	0.006171	10.45102	0.021474	1.507159	0.001087	0.004262	32.67143	0.028732
Jun	1759945	0.005588	10.45388	0.020295	1.507414	0.001073	0.004264	32.6774	0.025507
Jul	993679	0.006099	10.4592	0.023444	1.507633	0.001108	0.004266	32.72443	0.034072
Aug	674953	0.00634	10.46098	0.02419	1.50801	0.001117	0.004267	32.73896	0.036098
Sep	624644	0.006907	10.45648	0.025392	1.507389	0.001132	0.004265	32.72531	0.039391
Oct	457989	0.006715	10.46562	0.025841	1.508672	0.001136	0.00427	32.77276	0.040583
Nov	186893	0.008747	10.5089	0.042176	1.511867	0.001319	0.00429	33.08994	0.084956
Dec	120006	0.010951	10.55249	0.058567	1.515295	0.001503	0.004311	33.40611	0.12948

Pelly R upstream of Anvil Creek

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	84549	0.012781	10.58739	0.070558	1.518914	0.001638	0.004329	33.65714	0.16204
Feb	61350	0.014577	10.62514	0.084023	1.522181	0.001789	0.004347	33.92935	0.198611
Mar	58463	0.016621	10.68572	0.106895	1.525198	0.002043	0.004375	34.36836	0.260738
Apr	72976	0.016288	10.68578	0.113944	1.52074	0.002119	0.004372	34.41021	0.27994
May	1162431	0.006162	10.45101	0.021439	1.507163	0.001087	0.004262	32.67119	0.028637
Jun	1765521	0.005584	10.45387	0.020275	1.507416	0.001072	0.004264	32.67722	0.025453
Jul	997566	0.006092	10.45917	0.023407	1.507634	0.001108	0.004266	32.72402	0.033972
Aug	677671	0.006332	10.46094	0.024149	1.50801	0.001117	0.004267	32.73848	0.035987
Sep	628304	0.006891	10.45645	0.025326	1.507393	0.001131	0.004265	32.7247	0.039211
Oct	459896	0.006704	10.46556	0.025791	1.50867	0.001135	0.00427	32.77213	0.040449
Nov	187757	0.008726	10.50863	0.042047	1.51185	0.001317	0.00429	33.08778	0.084603
Dec	120642	0.010915	10.55196	0.058332	1.515257	0.0015	0.004311	33.40196	0.128841

Pelly River

Total Flow in Pelly River just below Anvil Creek

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	88929	5.55742E-05	0.118299	0.001821	34.94911	0.001088	0.328779	0.002399	0.040863	1.983144
Feb	64573	7.46278E-05	0.161093	0.002143	35.00618	0.001248	0.332248	0.002819	0.053637	2.73262
Mar	61771	9.72815E-05	0.213007	0.002469	35.07373	0.001481	0.336814	0.003401	0.06962	3.62846
Apr	79293	8.70051E-05	0.188189	0.002111	34.88186	0.001449	0.327847	0.003274	0.062774	3.149313
May	1217912	1.14397E-05	0.0172	0.000791	34.75613	0.000566	0.316556	0.001165	0.009395	0.267898
Jun	1822588	7.92254E-06	0.012062	0.000761	34.84934	0.000557	0.321334	0.001133	0.008171	0.190513
Jul	1037313	1.08482E-05	0.017503	0.00083	34.81372	0.000587	0.319712	0.001201	0.00977	0.274175
Aug	705509	1.38141E-05	0.023728	0.000875	34.81024	0.000601	0.319544	0.001246	0.011508	0.384965
Sep	665776	1.62119E-05	0.025742	0.000951	34.69923	0.000609	0.313947	0.001261	0.011796	0.399261
Oct	479448	1.6938E-05	0.03015	0.00099	34.81224	0.000627	0.319696	0.001309	0.013345	0.493513
Nov	196581	2.77481E-05	0.054873	0.001315	34.85403	0.000789	0.32274	0.001668	0.021303	0.896233
Dec	127112	3.78105E-05	0.078114	0.001501	34.88094	0.000938	0.324765	0.002005	0.028856	1.277308

At 09BC001 (Pelly River at Pelly Crossing)

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	184810	2.67419E-05	0.056925	0.001175	34.99627	0.000783	0.32973	0.001673	0.022248	0.965395
Feb	135464	3.55736E-05	0.07679	0.001323	35.02388	0.000857	0.331392	0.001867	0.028176	1.313806
Mar	133384	4.50516E-05	0.098645	0.001453	35.05562	0.000954	0.333484	0.002112	0.034917	1.691871
Apr	169517	4.06972E-05	0.088027	0.001294	34.96603	0.000944	0.329319	0.002063	0.032015	1.48452
May	2070403	6.72942E-06	0.010118	0.000703	34.87302	0.000539	0.322344	0.001097	0.007579	0.166417
Jun	3473280	4.15732E-06	0.006329	0.000673	34.93995	0.00053	0.325743	0.00107	0.006656	0.110159
Jul	1990051	5.65462E-06	0.009123	0.000709	34.92205	0.000545	0.32493	0.001105	0.007478	0.153177
Aug	1352592	7.2054E-06	0.012376	0.000732	34.92016	0.000553	0.324839	0.001128	0.008387	0.211053
Sep	1192320	9.05249E-06	0.014374	0.000786	34.84972	0.000561	0.321306	0.001146	0.008787	0.232409
Oct	875837	9.27215E-06	0.016505	0.000803	34.91532	0.00057	0.324636	0.001169	0.009561	0.279859
Nov	388800	1.40297E-05	0.027744	0.00095	34.94597	0.000646	0.326632	0.001338	0.013235	0.463743
Dec	265697	1.80889E-05	0.03737	0.001019	34.9639	0.000709	0.327815	0.001481	0.016404	0.622257

Pelly River

Total Flow in Pelly River just bel

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	88929	0.061403	10.59414	0.119153	1.585438	0.002461	0.004519	37.48501	0.499822
Feb	64573	0.064097	10.67635	0.146434	1.594622	0.002857	0.004626	39.61154	0.634451
Mar	61771	0.07039	10.79254	0.188223	1.608706	0.003422	0.004758	42.25358	0.827299
Apr	79293	0.094541	10.68109	0.189078	1.623321	0.003345	0.004635	40.33798	0.802235
May	1217912	0.04845	10.30153	0.028422	1.546266	0.001202	0.00419	31.87669	0.074523
Jun	1822588	0.03486	10.35634	0.025933	1.535409	0.001166	0.00422	32.17001	0.062848
Jul	1037313	0.042028	10.34543	0.031584	1.542724	0.001243	0.004221	32.23675	0.088503
Aug	705509	0.043224	10.34628	0.033795	1.544196	0.001281	0.00423	32.46791	0.101423
Sep	665776	0.059333	10.28196	0.035898	1.557766	0.001314	0.004194	31.97268	0.111619
Oct	479448	0.044922	10.35499	0.037652	1.547561	0.001346	0.004248	32.75423	0.123135
Nov	196581	0.052012	10.43886	0.066341	1.562951	0.001735	0.004339	34.16847	0.253726
Dec	127112	0.060771	10.50779	0.093893	1.57781	0.00209	0.00441	35.40479	0.373883

At 09BC001 (Pelly River at Pelly

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	184810	0.031758	10.5198	0.064599	1.545262	0.001703	0.004386	34.96101	0.244849
Feb	135464	0.032784	10.55834	0.077129	1.549291	0.001885	0.004436	35.95273	0.306807
Mar	133384	0.034886	10.60909	0.094684	1.554638	0.002122	0.004492	37.08137	0.387617
Apr	169517	0.046491	10.55855	0.095894	1.561942	0.002097	0.004436	36.23013	0.379702
May	2070403	0.030255	10.36301	0.022484	1.53051	0.001119	0.00422	32.18275	0.047282
Jun	3473280	0.020318	10.40125	0.020262	1.522383	0.001087	0.00424	32.38387	0.036954
Jul	1990051	0.023947	10.3959	0.023165	1.5261	0.001127	0.004241	32.42023	0.050136
Aug	1352592	0.024584	10.3963	0.024325	1.52688	0.001147	0.004245	32.54067	0.056903
Sep	1192320	0.035013	10.35654	0.026227	1.535789	0.001175	0.004224	32.25854	0.06602
Oct	875837	0.02652	10.39837	0.026948	1.529656	0.00119	0.004255	32.69348	0.071191
Nov	388800	0.028405	10.44479	0.040464	1.535784	0.001371	0.004301	33.40292	0.132421
Dec	265697	0.031297	10.47809	0.052221	1.541398	0.001522	0.004333	33.95227	0.183231

Pelly River

Condition: Future Worst Case - Base Case

Location: Pelly River above Vangorda Creek

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	
Jan	83752		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Feb	60765		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Mar	57864		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Apr	71821		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
May	1152643		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Jun	1755415		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Jul	990512		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Aug	672737		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Sep	621684		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Oct	456449		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Nov	186178		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438
Dec	119473		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438

Total Flow at 09BC004 (Pelly River below Vangorda Creek)

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	84121	2.30373E-06	0.016708	0.000612	35.07739	0.000929	0.330329	0.002221	0.013764	0.175228
Feb	61038	2.6487E-06	0.02065	0.00062	35.10495	0.001032	0.330571	0.002512	0.015851	0.211775
Mar	58148	3.29224E-06	0.027366	0.000632	35.14302	0.001206	0.330904	0.003006	0.019402	0.273956
Apr	72369	3.99359E-06	0.029613	0.000638	35.09462	0.00126	0.330173	0.003163	0.020549	0.294106
May	1157010	9.81382E-07	0.002318	0.000584	34.9816	0.000555	0.329532	0.001159	0.00615	0.041903
Jun	1759945	6.87384E-07	0.001928	0.000582	35.00155	0.000547	0.3299	0.001134	0.005963	0.038625
Jul	993679	8.88192E-07	0.002867	0.000585	34.99575	0.00057	0.329764	0.001202	0.006451	0.047173
Aug	674953	9.23226E-07	0.003087	0.000585	34.99574	0.000576	0.329748	0.001218	0.006566	0.04919
Sep	624644	1.26705E-06	0.003493	0.000587	34.97011	0.000585	0.329297	0.001243	0.006757	0.052549
Oct	457989	9.84044E-07	0.00357	0.000586	34.99861	0.000589	0.329755	0.001253	0.006821	0.053653
Nov	186893	1.47168E-06	0.008341	0.000596	35.0238	0.000712	0.329933	0.001604	0.009341	0.097788
Dec	120006	2.03215E-06	0.01314	0.000605	35.04915	0.000836	0.330062	0.001957	0.011871	0.142095

Pelly River

Condition Future Worst Case - Base Case

Location Pelly River above Vangorda Cre

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	83752	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Feb	60765	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Mar	57864	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Apr	71821	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
May	1152643	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Jun	1755415	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Jul	990512	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Aug	672737	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Sep	621684	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Oct	456449	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Nov	186178	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Dec	119473	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364

Total Flow at 09BC004 (Pelly Riv

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	84121	0.013224	10.68454	0.146835	1.519229	0.002162	0.0044	34.62264	0.367432
Feb	61038	0.015124	10.74544	0.178456	1.522575	0.002438	0.004436	35.1248	0.452892
Mar	58148	0.017343	10.84544	0.232235	1.525717	0.002904	0.004492	35.95531	0.598243
Apr	72369	0.017097	10.85877	0.24952	1.521306	0.003051	0.004498	36.12782	0.645017
May	1157010	0.006223	10.46373	0.031494	1.507193	0.001156	0.004272	32.79804	0.055711
Jun	1759945	0.005632	10.46458	0.028728	1.507443	0.00113	0.004271	32.78397	0.048216
Jul	993679	0.006166	10.47526	0.036092	1.507676	0.001195	0.004278	32.88425	0.068128
Aug	674953	0.006412	10.4783	0.037834	1.508056	0.001211	0.00428	32.91137	0.072837
Sep	624644	0.006987	10.47586	0.040656	1.507442	0.001237	0.004279	32.91818	0.08049
Oct	457989	0.006798	10.48574	0.04169	1.508726	0.001245	0.004284	32.97304	0.08326
Nov	186893	0.008945	10.55672	0.079857	1.511996	0.001577	0.004326	33.56609	0.186416
Dec	120006	0.011264	10.62812	0.118153	1.515498	0.001911	0.004367	34.15905	0.289922

Pelly River

Pelly R upstream of Anvil Creek

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	84549	2.29206E-06	0.016624	0.000612	35.0772	0.000927	0.33033	0.002215	0.013719	0.174449
Feb	61350	2.63523E-06	0.020545	0.00062	35.10462	0.001029	0.330571	0.002504	0.015796	0.210807
Mar	58463	3.27451E-06	0.027219	0.000632	35.14246	0.001202	0.330902	0.002995	0.019324	0.272596
Apr	72976	3.96037E-06	0.029366	0.000637	35.09416	0.001253	0.330177	0.003145	0.02042	0.291838
May	1162431	9.76806E-07	0.002307	0.000584	34.98187	0.000555	0.329538	0.001159	0.006144	0.041807
Jun	1765521	6.85213E-07	0.001922	0.000582	35.00167	0.000547	0.329902	0.001134	0.00596	0.038571
Jul	997566	8.84731E-07	0.002856	0.000585	34.99592	0.00057	0.329767	0.001201	0.006445	0.047073
Aug	677671	9.19522E-07	0.003074	0.000585	34.99592	0.000576	0.329751	0.001217	0.00656	0.049079
Sep	628304	1.25967E-06	0.003472	0.000587	34.97052	0.000584	0.329305	0.001242	0.006746	0.052368
Oct	459896	9.79963E-07	0.003556	0.000586	34.99878	0.000588	0.329758	0.001252	0.006813	0.053519
Nov	187757	1.46491E-06	0.008303	0.000596	35.02387	0.000711	0.329936	0.001602	0.009321	0.097437
Dec	120642	2.02143E-06	0.013071	0.000605	35.0491	0.000834	0.330065	0.001952	0.011835	0.141459

Total Flow in Pelly River just below Anvil Creek

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	88929	9.26951E-05	0.221028	0.007381	34.98266	0.002964	0.391521	0.004917	0.08079	3.354737
Feb	64573	0.000120873	0.288771	0.009011	35.04838	0.003565	0.409695	0.005933	0.103165	4.441401
Mar	61771	0.000157586	0.378724	0.011386	35.1263	0.00448	0.436959	0.00745	0.133884	5.844876
Apr	79293	0.000147529	0.35351	0.011115	34.92812	0.004461	0.428221	0.007368	0.127074	5.347028
May	1217912	1.64871E-05	0.031332	0.001558	34.76113	0.000826	0.325288	0.00151	0.014897	0.456615
Jun	1822588	1.22429E-05	0.024241	0.001427	34.85371	0.000784	0.32895	0.001433	0.012927	0.3527
Jul	1037313	1.71965E-05	0.035326	0.001806	34.8199	0.000918	0.330826	0.00164	0.016728	0.511371
Aug	705509	2.08332E-05	0.043399	0.001938	34.81742	0.000962	0.331663	0.001725	0.019157	0.648249
Sep	665776	2.40942E-05	0.048036	0.002157	34.70785	0.00102	0.3278	0.001803	0.020475	0.697774
Oct	479448	2.54432E-05	0.054189	0.002278	34.82187	0.001067	0.334517	0.001888	0.022678	0.816668
Nov	196581	4.67135E-05	0.107989	0.004201	34.87277	0.001768	0.3556	0.002969	0.04199	1.605256
Dec	127112	6.64332E-05	0.157522	0.005841	34.90608	0.002401	0.373747	0.003967	0.059812	2.33327

At 09BC001 (Pelly River at Pelly Crossing)

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	184810	4.46042E-05	0.106357	0.003851	35.01241	0.001685	0.359921	0.002885	0.041461	1.625395
Feb	135464	5.76178E-05	0.137652	0.004597	35.04399	0.001961	0.368309	0.003352	0.051785	2.128349
Mar	133384	7.29789E-05	0.175389	0.005582	35.07997	0.002343	0.379862	0.003987	0.064678	2.718306

Pelly River

Pelly R upstream of Anvil Creek

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	84549	0.013178	10.68335	0.146161	1.519172	0.002156	0.0044	34.61249	0.365613
Feb	61350	0.015068	10.74394	0.17762	1.5225	0.002431	0.004435	35.11206	0.450631
Mar	58463	0.017273	10.84331	0.23106	1.525622	0.002894	0.004491	35.93734	0.595066
Apr	72976	0.01699	10.85538	0.247561	1.521196	0.003034	0.004496	36.09864	0.639721
May	1162431	0.006214	10.46367	0.031412	1.507197	0.001155	0.004272	32.79721	0.05549
Jun	1765521	0.005628	10.46454	0.028682	1.507445	0.00113	0.004271	32.78345	0.04809
Jul	997566	0.006158	10.47516	0.036006	1.507677	0.001194	0.004278	32.88322	0.067895
Aug	677671	0.006403	10.47819	0.037738	1.508056	0.00121	0.00428	32.9102	0.072578
Sep	628304	0.006971	10.47571	0.0405	1.507445	0.001235	0.004279	32.91645	0.08007
Oct	459896	0.006787	10.48559	0.041575	1.508723	0.001244	0.004284	32.97158	0.082949
Nov	187757	0.008923	10.55624	0.079554	1.511978	0.001575	0.004325	33.56174	0.185597
Dec	120642	0.011227	10.62718	0.117604	1.515459	0.001907	0.004366	34.15094	0.288437

Total Flow in Pelly River just bel

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	88929	0.071427	10.9267	0.35968	1.584294	0.00432	0.00494	44.39734	1.879598
Feb	64573	0.076459	11.08709	0.443655	1.593136	0.005157	0.005148	48.17627	2.338984
Mar	61771	0.086249	11.32381	0.574915	1.605833	0.006417	0.005439	53.33948	3.036118
Apr	79293	0.110176	11.21332	0.581168	1.618488	0.006385	0.005325	51.39361	3.023315
May	1217912	0.049869	10.34777	0.061437	1.54629	0.001456	0.004248	32.83481	0.26559
Jun	1822588	0.036106	10.39663	0.054564	1.535489	0.001386	0.00427	33.00091	0.229078
Jul	1037313	0.043834	10.40424	0.073577	1.542754	0.001566	0.004294	33.45001	0.33149
Aug	705509	0.045201	10.41047	0.079482	1.544287	0.001633	0.004309	33.80064	0.36641
Sep	665776	0.061624	10.3553	0.087556	1.558098	0.001711	0.004284	33.49186	0.413368
Oct	479448	0.047382	10.4335	0.092788	1.547983	0.00177	0.004344	34.3876	0.445905
Nov	196581	0.057353	10.61286	0.19057	1.563038	0.002692	0.004556	37.77161	0.972663
Dec	127112	0.06859	10.76719	0.281663	1.576866	0.00354	0.004739	40.77027	1.450311

At 09BC001 (Pelly River at Pelly

Month	Flows (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	184810	0.036581	10.67982	0.180339	1.544712	0.002598	0.004589	38.28716	0.908787
Feb	135464	0.038677	10.75413	0.218808	1.548583	0.002981	0.004684	40.03537	1.119326
Mar	133384	0.042231	10.85512	0.273763	1.553307	0.003509	0.004807	42.21531	1.410534

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

Pelly River											
Apr	169517	6.90076E-05	0.165356	0.005506	34.98767	0.002353	0.37627	0.003978	0.062092	2.512514	
May	2070403	9.6985E-06	0.018431	0.001154	34.87596	0.000692	0.32748	0.0013	0.010815	0.27743	
Jun	3473280	6.4244E-06	0.01272	0.001023	34.94224	0.000649	0.32974	0.001227	0.009152	0.195266	
Jul	1990051	8.96368E-06	0.018414	0.001217	34.92527	0.000718	0.330723	0.001334	0.011105	0.276815	
Aug	1352592	1.08665E-05	0.022637	0.001286	34.9239	0.000741	0.33116	0.001378	0.012377	0.348381	
Sep	1192320	1.34539E-05	0.026823	0.001459	34.85453	0.00079	0.329042	0.001449	0.013634	0.399095	
Oct	875837	1.3928E-05	0.029664	0.001508	34.92059	0.000811	0.33275	0.001486	0.01467	0.45676	
Nov	388800	2.36188E-05	0.054601	0.002409	34.95544	0.001141	0.343246	0.001996	0.023695	0.822233	
Dec	265697	3.17823E-05	0.07536	0.003095	34.97593	0.001409	0.351248	0.002419	0.031214	1.127439	
		3.02454E-05	0.070284	0.002724		0.001274			0.02889		

Pelly River

Apr	169517	0.053804	10.8075	0.279296	1.559681	0.003519	0.00476	41.40147	1.418625
May	2070403	0.03109	10.39021	0.041904	1.530524	0.001268	0.004254	32.74636	0.159677
Jun	3473280	0.020972	10.4224	0.035286	1.522425	0.001203	0.004266	32.81988	0.124182
Jul	1990051	0.024889	10.42655	0.045054	1.526115	0.001295	0.004279	33.05264	0.176793
Aug	1352592	0.025616	10.42979	0.048155	1.526927	0.00133	0.004287	33.23582	0.19512
Sep	1192320	0.036293	10.39749	0.055073	1.535974	0.001397	0.004274	33.10684	0.234513
Oct	875837	0.027867	10.44135	0.05713	1.529888	0.001422	0.004307	33.58761	0.247881
Nov	388800	0.031106	10.53276	0.103276	1.535828	0.001855	0.004411	35.22471	0.495923
Dec	265697	0.035037	10.60219	0.142052	1.540946	0.002215	0.00449	36.51916	0.698205
				0.123345		0.002049	0.004451		0.59913

APPENDIX A-1

PREDICTED WATER QUALITY DATA FOR THE BASE CASE SCENARIO

APPENDIX A-2

PREDICTED WATER QUALITY DATA FOR THE HYPOTHETICAL “REMEDIATION” SCENARIO

FaroSite

Summary Tables

Conditions: Base Case Current Loadings

Location	X2	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Jan	594	0.0001	0.0695	0.0012	29.8389	0.0003	0.0043	0.0007	0.0050
	Feb	425	0.0001	0.0704	0.0013	29.9015	0.0003	0.0053	0.0007	0.0051
	Mar	426	0.0001	0.0716	0.0014	29.9817	0.0003	0.0066	0.0008	0.0053
	Apr	859	0.0001	0.0697	0.0012	29.8524	0.0003	0.0045	0.0007	0.0050
	May	7989	0.0001	0.0664	0.0010	29.6279	0.0002	0.0007	0.0006	0.0046
	Jun	8136	0.0001	0.0665	0.0010	29.6364	0.0002	0.0009	0.0006	0.0046
	Jul	5641	0.0001	0.0666	0.0010	29.6455	0.0002	0.0010	0.0006	0.0046
	Aug	3925	0.0001	0.0667	0.0010	29.6482	0.0002	0.0011	0.0006	0.0046
	Sep	5339	0.0001	0.0665	0.0010	29.6355	0.0002	0.0009	0.0006	0.0046
	Oct	2735	0.0001	0.0668	0.0011	29.6552	0.0002	0.0012	0.0006	0.0046
	Nov	1214	0.0001	0.0678	0.0011	29.7266	0.0002	0.0024	0.0007	0.0048
	Dec	904	0.0001	0.0685	0.0012	29.7744	0.0003	0.0032	0.0007	0.0049
	Total	38187								

Location	X14	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Jan	1289	0.0002	0.1759	0.0038	25.1438	0.0026	0.0089	0.0033	0.0424
	Feb	972	0.0002	0.2164	0.0044	24.1357	0.0031	0.0106	0.0039	0.0551
	Mar	1001	0.0002	0.2569	0.0048	23.7083	0.0033	0.0129	0.0044	0.0672
	Apr	1766	0.0002	0.1875	0.0034	26.3919	0.0021	0.0099	0.0028	0.0439
	May	14354	0.0001	0.0833	0.0013	29.1865	0.0004	0.0016	0.0009	0.0101
	Jun	14673	0.0001	0.0831	0.0014	29.2214	0.0005	0.0020	0.0009	0.0100
	Jul	10265	0.0001	0.0866	0.0015	29.0458	0.0005	0.0024	0.0010	0.0113
	Aug	7225	0.0001	0.0956	0.0016	28.7826	0.0007	0.0024	0.0012	0.0142
	Sep	9697	0.0001	0.0872	0.0014	29.0140	0.0005	0.0019	0.0010	0.0114
	Oct	5111	0.0001	0.1027	0.0018	28.4442	0.0008	0.0027	0.0013	0.0166
	Nov	2395	0.0001	0.1231	0.0025	27.3003	0.0015	0.0054	0.0020	0.0243
	Dec	1831	0.0001	0.1340	0.0030	26.5292	0.0019	0.0071	0.0025	0.0287
	Total	70579								

FaroSite

Summary Tables

Conditions: Base Case Current Loadings

Location	X2	Flows (x 1000 m ³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
	Jan	594	0.2821	0.9305	6.8471	0.0340	2.2994	0.0014	0.0019	2.4972	0.0726
	Feb	425	0.2868	0.9329	6.9270	0.0354	2.3082	0.0015	0.0019	3.1369	0.0847
	Mar	426	0.2927	0.9359	7.0293	0.0373	2.3194	0.0016	0.0020	3.9564	0.1001
	Apr	859	0.2831	0.9310	6.8644	0.0343	2.3013	0.0014	0.0019	2.6350	0.0752
	May	7989	0.2665	0.9224	6.5778	0.0291	2.2699	0.0011	0.0017	0.3403	0.0319
	Jun	8136	0.2672	0.9227	6.5886	0.0293	2.2711	0.0012	0.0017	0.4268	0.0336
	Jul	5641	0.2678	0.9230	6.6003	0.0295	2.2724	0.0012	0.0017	0.5203	0.0353
	Aug	3925	0.2680	0.9231	6.6037	0.0295	2.2727	0.0012	0.0017	0.5478	0.0359
	Sep	5339	0.2671	0.9227	6.5875	0.0292	2.2710	0.0012	0.0017	0.4178	0.0334
	Oct	2735	0.2685	0.9234	6.6127	0.0297	2.2737	0.0012	0.0017	0.6193	0.0372
	Nov	1214	0.2738	0.9262	6.7037	0.0314	2.2837	0.0013	0.0018	1.3488	0.0510
	Dec	904	0.2774	0.9280	6.7648	0.0325	2.2904	0.0013	0.0018	1.8375	0.0602
	Total	38187									

Location	X14	Flows (x 1000 m ³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
	Jan	1289	2.5201	3.7206	8.8686	0.0741	8.4615	0.0112	0.0110	91.7406	0.4323
	Feb	972	3.3176	4.2999	9.3308	0.0861	9.7427	0.0134	0.0130	111.4519	0.5346
	Mar	1001	4.0701	4.5177	9.5617	0.0990	10.2249	0.0144	0.0138	120.5375	0.6507
	Apr	1766	2.6355	2.8964	8.3055	0.0765	6.6385	0.0086	0.0084	67.8156	0.4620
	May	14354	0.5990	1.1721	6.7675	0.0352	2.8211	0.0021	0.0026	8.7645	0.0884
	Jun	14673	0.5895	1.1592	6.7743	0.0360	2.7929	0.0020	0.0025	8.4844	0.0975
	Jul	10265	0.6633	1.2729	6.8707	0.0378	3.0446	0.0025	0.0029	12.1756	0.1134
	Aug	7225	0.8472	1.4197	6.9739	0.0398	3.3691	0.0030	0.0034	17.0111	0.1289
	Sep	9697	0.6806	1.2808	6.8570	0.0368	3.0617	0.0025	0.0029	12.3028	0.1030
	Oct	5111	0.9984	1.6260	7.1293	0.0421	3.8253	0.0037	0.0041	23.5990	0.1473
	Nov	2395	1.4308	2.3802	7.7797	0.0537	5.4952	0.0064	0.0066	48.0142	0.2541
	Dec	1831	1.6707	2.8945	8.2200	0.0608	6.6340	0.0082	0.0083	64.4899	0.3198
	Total	70579									

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

FaroSite

Location	Mouth of Rose Creek		Ag	Al	As	Ca	Cd	Cl	Co	Cu
	Flows		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	(x 1000 m ³)									
	Jan	1725	0.0002	0.1481	0.0031	26.2683	0.0020	0.0067	0.0026	0.0328
	Feb	1290	0.0002	0.1793	0.0035	25.4791	0.0024	0.0080	0.0031	0.0426
	Mar	1322	0.0002	0.2106	0.0039	25.1343	0.0026	0.0098	0.0035	0.0520
	Apr	2383	0.0002	0.1560	0.0028	27.2217	0.0016	0.0074	0.0023	0.0337
	May	19866	0.0001	0.0784	0.0012	29.2999	0.0004	0.0012	0.0008	0.0085
	Jun	20343	0.0001	0.0783	0.0013	29.3255	0.0004	0.0015	0.0008	0.0085
	Jul	14218	0.0001	0.0808	0.0013	29.1985	0.0004	0.0018	0.0009	0.0094
	Aug	9990	0.0001	0.0874	0.0014	29.0074	0.0005	0.0018	0.0010	0.0115
	Sep	13419	0.0001	0.0813	0.0013	29.1751	0.0004	0.0015	0.0009	0.0095
	Oct	7050	0.0001	0.0926	0.0015	28.7607	0.0006	0.0020	0.0011	0.0133
	Nov	3273	0.0001	0.1078	0.0021	27.9161	0.0011	0.0040	0.0016	0.0190
	Dec	2478	0.0001	0.1162	0.0025	27.3296	0.0014	0.0053	0.0020	0.0224
	Total	97354								

Location	Mouth of Anvil Creek		Ag	Al	As	Ca	Cd	Cl	Co	Cu
	Flows		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	(x 1000 m ³)									
	Jan	4529	0.0001	0.0972	0.0018	28.3281	0.0009	0.0027	0.0014	0.0153
	Feb	3332	0.0001	0.1098	0.0020	28.0020	0.0010	0.0032	0.0016	0.0193
	Mar	3382	0.0001	0.1225	0.0021	27.8519	0.0011	0.0040	0.0017	0.0231
	Apr	6356	0.0001	0.0997	0.0017	28.7052	0.0007	0.0029	0.0012	0.0155
	May	55342	0.0001	0.0704	0.0011	29.4891	0.0003	0.0006	0.0007	0.0059
	Jun	56833	0.0001	0.0703	0.0011	29.4986	0.0003	0.0007	0.0007	0.0059
	Jul	39657	0.0001	0.0713	0.0011	29.4528	0.0003	0.0008	0.0007	0.0063
	Aug	27781	0.0001	0.0736	0.0012	29.3837	0.0003	0.0008	0.0007	0.0070
	Sep	37369	0.0001	0.0714	0.0011	29.4442	0.0003	0.0006	0.0007	0.0063
	Oct	19530	0.0001	0.0755	0.0012	29.2938	0.0004	0.0009	0.0008	0.0077
	Nov	8927	0.0001	0.0813	0.0014	28.9794	0.0005	0.0016	0.0010	0.0098
	Dec	6642	0.0001	0.0847	0.0015	28.7498	0.0007	0.0021	0.0011	0.0112
	Total	269678								

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

FaroSite

Location	Mouth of Rose Creek		Fe	K	Mg	Mn	Na	Ni	Pb	SO4	Zn
	Flows (x 1000 m ³)		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan	1725		1.9502	3.0134	8.2793	0.0625	6.8961	0.0087	0.0087	68.5650	0.3295
Feb	1290		2.5662	3.4685	8.6430	0.0719	7.9028	0.0104	0.0102	84.0281	0.4093
Mar	1322		3.1481	3.6464	8.8287	0.0819	8.2968	0.0112	0.0109	91.3387	0.4992
Apr	2383		2.0211	2.3847	7.8471	0.0640	5.5056	0.0067	0.0067	50.2484	0.3489
May	19866		0.5060	1.1024	6.7032	0.0333	2.6669	0.0018	0.0023	6.3337	0.0710
Jun	20343		0.4988	1.0928	6.7078	0.0339	2.6458	0.0018	0.0023	6.1207	0.0775
Jul	14218		0.5523	1.1751	6.7776	0.0351	2.8280	0.0021	0.0026	8.7918	0.0890
Aug	9990		0.6858	1.2817	6.8527	0.0366	3.0636	0.0025	0.0029	12.3049	0.1004
Sep	13419		0.5651	1.1811	6.7679	0.0345	2.8408	0.0021	0.0026	8.8920	0.0815
Oct	7050		0.7964	1.4321	6.9661	0.0383	3.3962	0.0030	0.0034	17.1090	0.1138
Nov	3273		1.1177	1.9886	7.4459	0.0469	4.6284	0.0050	0.0053	35.1297	0.1928
Dec	2478		1.3034	2.3793	7.7803	0.0523	5.4934	0.0064	0.0066	47.6536	0.2430
Total	97354										

Location	Mouth of Anvil Creek		Fe	K	Mg	Mn	Na	Ni	Pb	SO4	Zn
	Flows (x 1000 m ³)		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan	4529		0.9062	1.7179	7.1997	0.0413	4.0288	0.0040	0.0044	26.1130	0.1413
Feb	3332		1.1551	1.9070	7.3514	0.0452	4.4472	0.0047	0.0050	32.5248	0.1741
Mar	3382		1.3911	1.9861	7.4318	0.0492	4.6222	0.0050	0.0053	35.6942	0.2107
Apr	6356		0.9228	1.4698	7.0274	0.0417	3.4801	0.0032	0.0036	18.8411	0.1468
May	55342		0.3510	0.9862	6.5959	0.0301	2.4094	0.0014	0.0019	2.2760	0.0419
Jun	56833		0.3481	0.9826	6.5974	0.0303	2.4015	0.0013	0.0019	2.1933	0.0442
Jul	39657		0.3674	1.0122	6.6225	0.0308	2.4670	0.0015	0.0020	3.1545	0.0483
Aug	27781		0.4157	1.0508	6.6497	0.0313	2.5524	0.0016	0.0021	4.4271	0.0525
Sep	37369		0.3722	1.0144	6.6191	0.0305	2.4720	0.0015	0.0020	3.1954	0.0457
Oct	19530		0.4563	1.1056	6.6911	0.0319	2.6735	0.0018	0.0023	6.1784	0.0575
Nov	8927		0.5771	1.3125	6.8695	0.0351	3.1318	0.0025	0.0030	12.8835	0.0869
Dec	6642		0.6519	1.4651	7.0001	0.0373	3.4697	0.0031	0.0035	17.7813	0.1067
Total	269678										

FaroSite

Conditions: Base Case Intermediate Loadings (Revised to Future 2 in Dec2005)

Location	X2	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Jan	594	0.0001	0.0734	0.0011	29.8800	0.0003	0.0049	0.0008	0.0059
	Feb	424	0.0001	0.0753	0.0012	29.9535	0.0003	0.0062	0.0008	0.0061
	Mar	424	0.0001	0.0778	0.0012	30.0481	0.0004	0.0077	0.0009	0.0065
	Apr	858	0.0001	0.0738	0.0011	29.8958	0.0003	0.0052	0.0008	0.0060
	May	8011	0.0001	0.0669	0.0010	29.6333	0.0002	0.0008	0.0006	0.0051
	Jun	8158	0.0001	0.0672	0.0010	29.6431	0.0002	0.0010	0.0006	0.0052
	Jul	5656	0.0001	0.0674	0.0010	29.6538	0.0002	0.0012	0.0006	0.0052
	Aug	3935	0.0001	0.0675	0.0010	29.6569	0.0002	0.0012	0.0006	0.0052
	Sep	5354	0.0001	0.0671	0.0010	29.6421	0.0002	0.0010	0.0006	0.0052
	Oct	2741	0.0001	0.0677	0.0010	29.6651	0.0002	0.0014	0.0006	0.0052
	Nov	1215	0.0001	0.0699	0.0011	29.7484	0.0003	0.0028	0.0007	0.0055
	Dec	904	0.0001	0.0714	0.0011	29.8043	0.0003	0.0037	0.0007	0.0057
	Total	38187								
Location	X14	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Jan	1274	0.0001	0.0750	0.0029	28.6660	0.0022	0.0048	0.0026	0.0135
	Feb	955	0.0001	0.0806	0.0033	28.4471	0.0027	0.0057	0.0031	0.0163
	Mar	976	0.0001	0.0889	0.0036	28.3720	0.0029	0.0070	0.0033	0.0192
	Apr	1738	0.0001	0.0831	0.0025	28.9731	0.0017	0.0054	0.0022	0.0139
	May	14389	0.0001	0.0685	0.0012	29.5196	0.0004	0.0009	0.0008	0.0062
	Jun	14706	0.0001	0.0687	0.0012	29.5321	0.0004	0.0011	0.0008	0.0063
	Jul	10282	0.0001	0.0689	0.0013	29.4961	0.0005	0.0013	0.0009	0.0066
	Aug	7229	0.0001	0.0699	0.0014	29.4369	0.0006	0.0014	0.0010	0.0071
	Sep	9715	0.0001	0.0688	0.0013	29.4836	0.0005	0.0011	0.0009	0.0065
	Oct	5109	0.0001	0.0702	0.0015	29.3618	0.0007	0.0015	0.0011	0.0077
	Nov	2386	0.0001	0.0709	0.0020	29.1282	0.0013	0.0029	0.0017	0.0095
	Dec	1820	0.0001	0.0707	0.0023	28.9684	0.0016	0.0038	0.0020	0.0105
	Total	70579								
	Average		0.0001	0.0721	0.0016		0.0008			0.0079

FaroSite

Conditions: Base Case Intermediate Loadings

Location X2

	Flows (x 1000 m ³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	594	0.3094	0.9339	6.8750	0.0398	2.3408	0.0016	0.0020		14.1 0.1141
Feb	424	0.3211	0.9372	6.9626	0.0428	2.3603	0.0017	0.0020		14.7 0.1369
Mar	424	0.3361	0.9414	7.0752	0.0466	2.3853	0.0019	0.0021		15.5 0.1663
Apr	858	0.3119	0.9346	6.8939	0.0405	2.3450	0.0016	0.0020		14.2 0.1190
May	8011	0.2702	0.9228	6.5814	0.0298	2.2754	0.0012	0.0017		12.0 0.0375
Jun	8158	0.2718	0.9233	6.5931	0.0302	2.2781	0.0012	0.0017		12.1 0.0406
Jul	5656	0.2734	0.9237	6.6058	0.0307	2.2809	0.0012	0.0018		12.2 0.0439
Aug	3935	0.2739	0.9239	6.6095	0.0308	2.2817	0.0012	0.0018		12.2 0.0448
Sep	5354	0.2716	0.9232	6.5919	0.0302	2.2778	0.0012	0.0017		12.1 0.0402
Oct	2741	0.2752	0.9242	6.6192	0.0311	2.2839	0.0012	0.0018		12.3 0.0474
Nov	1215	0.2885	0.9280	6.7184	0.0345	2.3059	0.0014	0.0018		13.0 0.0732
Dec	904	0.2974	0.9305	6.7850	0.0368	2.3207	0.0015	0.0019		13.5 0.0906
Total	38187									

Location X14

	Flows (x 1000 m ³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	1274	0.6845	3.8321	13.2914	0.0470	8.7326	0.0110	0.0112		118.2 0.2845
Feb	955	0.8436	4.4589	14.7408	0.0514	10.1245	0.0132	0.0132		141.2 0.3641
Mar	976	1.0086	4.7184	15.3776	0.0563	10.7062	0.0142	0.0141		151.2 0.4449
Apr	1738	0.7368	2.9874	11.4064	0.0476	6.8671	0.0083	0.0085		88.1 0.2966
May	14389	0.3306	1.1791	7.1479	0.0310	2.8405	0.0020	0.0026		21.3 0.0634
Jun	14706	0.3302	1.1658	7.1258	0.0314	2.8122	0.0020	0.0025		20.9 0.0654
Jul	10282	0.3435	1.2825	7.3971	0.0322	3.0714	0.0024	0.0029		25.1 0.0746
Aug	7229	0.3776	1.4343	7.7409	0.0328	3.4076	0.0029	0.0034		30.7 0.0901
Sep	9715	0.3454	1.2908	7.4064	0.0317	3.0885	0.0024	0.0029		25.4 0.0726
Oct	5109	0.4040	1.6468	8.2257	0.0336	3.8785	0.0036	0.0041		38.4 0.1049
Nov	2386	0.4816	2.4259	10.0419	0.0387	5.6104	0.0063	0.0066		66.8 0.1637
Dec	1820	0.5229	2.9589	11.2822	0.0420	6.7951	0.0081	0.0083		86.2 0.1988
Total	70579									
Average					0.0375		0.0039	0.0043		0.1324

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

FaroSite

Location	Mouth of Rose Creek		Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Flows (x 1000 m ³)									
Jan	1725		0.0003	0.5488	0.0053	33.6388	0.0027	0.0269	0.0052	0.1443
Feb	1290		0.0004	0.7237	0.0064	34.5201	0.0033	0.0323	0.0066	0.1938
Mar	1322		0.0005	0.8889	0.0075	34.9818	0.0038	0.0398	0.0078	0.2403
Apr	2383		0.0003	0.5681	0.0052	32.6543	0.0024	0.0297	0.0050	0.1485
May	19866		0.0001	0.1351	0.0016	29.9856	0.0005	0.0044	0.0012	0.0243
Jun	20343		0.0001	0.1332	0.0016	29.9897	0.0005	0.0055	0.0012	0.0239
Jul	14218		0.0001	0.1487	0.0018	30.1493	0.0006	0.0066	0.0014	0.0284
Aug	9990		0.0002	0.1864	0.0020	30.3364	0.0007	0.0068	0.0016	0.0390
Sep	13419		0.0001	0.1520	0.0017	30.1357	0.0006	0.0053	0.0014	0.0292
Oct	7050		0.0002	0.2179	0.0022	30.6047	0.0009	0.0076	0.0019	0.0481
Nov	3273		0.0002	0.3108	0.0033	31.6940	0.0015	0.0157	0.0030	0.0756
Dec	2478		0.0002	0.3649	0.0040	32.4497	0.0019	0.0210	0.0036	0.0918
Total	97354									

Location	Mouth of Anvil Creek		Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Flows (x 1000 m ³)									
Jan	4514		0.0001	0.0685	0.0015	29.3328	0.0008	0.0015	0.0012	0.0074
Feb	3315		0.0001	0.0701	0.0017	29.2643	0.0009	0.0018	0.0013	0.0083
Mar	3357		0.0001	0.0726	0.0017	29.2393	0.0010	0.0022	0.0014	0.0091
Apr	6328		0.0001	0.0706	0.0014	29.4242	0.0006	0.0016	0.0010	0.0075
May	55377		0.0001	0.0666	0.0010	29.5754	0.0002	0.0004	0.0007	0.0053
Jun	56866		0.0001	0.0666	0.0010	29.5787	0.0002	0.0004	0.0007	0.0053
Jul	39674		0.0001	0.0667	0.0011	29.5694	0.0003	0.0005	0.0007	0.0054
Aug	27785		0.0001	0.0669	0.0011	29.5539	0.0003	0.0005	0.0007	0.0056
Sep	37386		0.0001	0.0667	0.0011	29.5661	0.0003	0.0004	0.0007	0.0054
Oct	19529		0.0001	0.0670	0.0011	29.5340	0.0003	0.0005	0.0007	0.0057
Nov	8917		0.0001	0.0672	0.0013	29.4701	0.0005	0.0009	0.0009	0.0062
Dec	6631		0.0001	0.0672	0.0014	29.4230	0.0006	0.0012	0.0010	0.0065
Total	269678.32									

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

FaroSite

Location	Mouth of Rose Creek		Fe	K	Mg	Mn	Na	Ni	Pb	SO4	Zn
	Flows (x 1000 m ³)		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan	1725		9.1506	3.0302	12.4753	0.1737	7.0218	0.0110	0.0095	261.6097	1.0309
Feb	1290		12.3779	3.4887	13.7642	0.2159	8.0538	0.0134	0.0113	321.3846	1.3291
Mar	1322		15.3766	3.6713	14.4307	0.2606	8.4830	0.0149	0.0123	349.6514	1.6421
Apr	2383		9.4130	2.4032	11.0126	0.1817	5.6443	0.0091	0.0076	191.5609	1.0862
May	19866		1.5202	1.1051	7.1067	0.0497	2.6866	0.0021	0.0025	24.1142	0.1734
Jun	20343		1.4756	1.0961	7.1122	0.0518	2.6706	0.0022	0.0024	23.1088	0.1863
Jul	14218		1.7583	1.1791	7.3471	0.0570	2.8579	0.0025	0.0027	33.2544	0.2223
Aug	9990		2.4638	1.2859	7.6212	0.0641	3.0949	0.0030	0.0031	46.9727	0.2739
Sep	13419		1.8323	1.1843	7.3273	0.0548	2.8649	0.0025	0.0027	33.8782	0.2084
Oct	7050		3.0541	1.4368	8.0157	0.0715	3.4311	0.0037	0.0037	65.4625	0.3258
Nov	3273		4.7530	1.9983	9.6183	0.1065	4.7014	0.0062	0.0057	133.7034	0.5637
Dec	2478		5.7416	2.3923	10.7311	0.1284	5.5913	0.0080	0.0072	181.0767	0.7115
Total	97354										

Location	Mouth of Anvil Creek		Fe	K	Mg	Mn	Na	Ni	Pb	SO4	Zn
	Flows (x 1000 m ³)		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Jan	4514		0.3827	1.7426	8.4423	0.0336	4.0905	0.0039	0.0044	41.8	0.0987
Feb	3315		0.4310	1.9403	8.8997	0.0350	4.5295	0.0046	0.0050	49.0	0.1231
Mar	3357		0.4806	2.0255	9.1074	0.0365	4.7203	0.0049	0.0053	52.3	0.1475
Apr	6328		0.3939	1.4886	7.8735	0.0336	3.5292	0.0031	0.0036	32.7	0.1000
May	55377		0.2814	0.9881	6.6948	0.0290	2.4148	0.0013	0.0019	14.2	0.0354
Jun	56866		0.2812	0.9844	6.6884	0.0291	2.4067	0.0013	0.0019	14.1	0.0359
Jul	39674		0.2847	1.0148	6.7590	0.0293	2.4742	0.0014	0.0020	15.2	0.0383
Aug	27785		0.2936	1.0546	6.8494	0.0295	2.5625	0.0016	0.0021	16.6	0.0424
Sep	37386		0.2852	1.0172	6.7620	0.0292	2.4792	0.0014	0.0020	15.3	0.0378
Oct	19529		0.3007	1.1110	6.9779	0.0297	2.6873	0.0018	0.0023	18.7	0.0463
Nov	8917		0.3223	1.3237	7.4738	0.0311	3.1602	0.0025	0.0030	26.5	0.0625
Dec	6631		0.3352	1.4806	7.8389	0.0321	3.5089	0.0030	0.0035	32.2	0.0732
Total	269678.32										

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

FaroSite

Conditions: Base Case Future Worst Loadings (Revised to Future 3 in Dec2005)

Location	X2	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Jan	594	0.0002	0.2921	0.0140	29.9629	0.0044	0.1500	0.0054	0.0852
	Feb	424	0.0002	0.3505	0.0174	30.0578	0.0055	0.1886	0.0067	0.1059
	Mar	424	0.0002	0.4255	0.0217	30.1799	0.0070	0.2383	0.0083	0.1325
	Apr	858	0.0002	0.3047	0.0147	29.9833	0.0047	0.1583	0.0057	0.0896
	May	8011	0.0001	0.0963	0.0027	29.6444	0.0008	0.0203	0.0012	0.0158
	Jun	8158	0.0001	0.1041	0.0032	29.6572	0.0009	0.0255	0.0014	0.0185
	Jul	5656	0.0001	0.1126	0.0037	29.6709	0.0011	0.0311	0.0016	0.0215
	Aug	3935	0.0001	0.1151	0.0038	29.6749	0.0011	0.0327	0.0016	0.0224
	Sep	5354	0.0001	0.1033	0.0032	29.6558	0.0009	0.0250	0.0014	0.0183
	Oct	2741	0.0001	0.1215	0.0042	29.6855	0.0012	0.0370	0.0018	0.0247
	Nov	1215	0.0001	0.1876	0.0080	29.7930	0.0025	0.0808	0.0032	0.0481
	Dec	904	0.0002	0.2320	0.0106	29.8652	0.0033	0.1102	0.0041	0.0639
	Total	38187								

Location	X14	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Jan	1274	0.0002	0.2454	0.0104	33.0977	0.0046	0.0880	0.0055	0.0714
	Feb	955	0.0002	0.2924	0.0124	33.8414	0.0056	0.1055	0.0066	0.0878
	Mar	976	0.0002	0.3516	0.0147	34.1812	0.0065	0.1303	0.0077	0.1078
	Apr	1738	0.0002	0.2699	0.0109	32.1490	0.0044	0.0984	0.0054	0.0777
	May	14389	0.0001	0.0951	0.0024	29.9175	0.0008	0.0143	0.0013	0.0153
	Jun	14706	0.0001	0.1000	0.0027	29.9108	0.0009	0.0179	0.0014	0.0171
	Jul	10282	0.0001	0.1070	0.0031	30.0520	0.0010	0.0216	0.0016	0.0197
	Aug	7229	0.0001	0.1131	0.0033	30.2247	0.0012	0.0225	0.0017	0.0218
	Sep	9715	0.0001	0.1014	0.0027	30.0513	0.0009	0.0174	0.0014	0.0177
	Oct	5109	0.0001	0.1201	0.0036	30.4717	0.0014	0.0251	0.0020	0.0245
	Nov	2386	0.0001	0.1675	0.0064	31.4206	0.0027	0.0519	0.0033	0.0425
	Dec	1820	0.0002	0.1963	0.0082	32.0680	0.0035	0.0690	0.0042	0.0537
	Total	70579								
			0.0002	0.1919	0.0078		0.0028			0.0501

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

FaroSite

Conditions: Base Case Future Worst Loadings

Location	X2	Flows (x 1000 m ³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
	Jan	594	3.1876	0.9577	7.4803	0.4392	2.3336	0.0051	0.0030		28.6 3.1038
	Feb	424	3.9424	0.9671	7.7241	0.5453	2.3513	0.0062	0.0033		33.0 3.8985
	Mar	424	4.9124	0.9793	8.0375	0.6817	2.3739	0.0075	0.0037		38.6 4.9199
	Apr	858	3.3504	0.9597	7.5329	0.4621	2.3374	0.0054	0.0030		29.6 3.2752
	May	8011	0.6569	0.9260	6.6627	0.0835	2.2745	0.0016	0.0019		14.0 0.4392
	Jun	8158	0.7580	0.9273	6.6954	0.0977	2.2768	0.0018	0.0019		14.6 0.5457
	Jul	5656	0.8673	0.9286	6.7307	0.1131	2.2794	0.0019	0.0020		15.2 0.6608
	Aug	3935	0.8995	0.9290	6.7411	0.1176	2.2801	0.0020	0.0020		15.4 0.6946
	Sep	5354	0.7475	0.9271	6.6920	0.0963	2.2766	0.0018	0.0019		14.5 0.5346
	Oct	2741	0.9830	0.9301	6.7681	0.1294	2.2821	0.0021	0.0020		15.9 0.7826
	Nov	1215	1.8374	0.9408	7.0441	0.2495	2.3021	0.0033	0.0024		20.8 1.6822
	Dec	904	2.4114	0.9480	7.2295	0.3301	2.3155	0.0041	0.0026		24.1 2.2865
	Total	38187									
Location	X14	Flows (x 1000 m ³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
	Jan	1274	3.1704	3.8454	23.8590	0.2830	8.7271	0.0132	0.0118		373.4 2.2194
	Feb	955	3.9626	4.4748	27.5828	0.3355	10.1179	0.0158	0.0140		451.6 2.7218
	Mar	976	4.8800	4.7381	29.2286	0.4077	10.6981	0.0174	0.0150		486.4 3.3640
	Apr	1738	3.4476	3.0023	19.0430	0.3108	6.8610	0.0107	0.0092		273.1 2.4406
	May	14389	0.7150	1.1813	8.1084	0.0688	2.8396	0.0024	0.0026		44.6 0.3699
	Jun	14706	0.7757	1.1685	8.0518	0.0784	2.8111	0.0024	0.0026		43.3 0.4394
	Jul	10282	0.8858	1.2857	8.7471	0.0891	3.0701	0.0029	0.0030		57.8 0.5283
	Aug	7229	1.0071	1.4377	9.6301	0.0927	3.4062	0.0034	0.0035		76.4 0.5808
	Sep	9715	0.8176	1.2934	8.7710	0.0777	3.0874	0.0028	0.0030		58.4 0.4471
	Oct	5109	1.1396	1.6506	10.8727	0.1007	3.8769	0.0042	0.0042		102.4 0.6615
	Nov	2386	1.8772	2.4337	15.5265	0.1770	5.6072	0.0075	0.0070		199.3 1.2833
	Dec	1820	2.3267	2.9693	18.7033	0.2254	6.7908	0.0097	0.0088		265.4 1.6737
	Total	70579									
						0.2330		0.0056	0.0048		1.6481

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

FaroSite

Location	Mouth of Rose Creek									
	Flows		Ag	Al	As	Ca	Cd	Cl	Co	Cu
	(x 1000 m ³)		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Jan	1725	0.0005	0.9737	0.0292	34.7912	0.0102	0.2964	0.0138	0.2978
	Feb	1290	0.0006	1.2383	0.0352	35.9275	0.0123	0.3561	0.0169	0.3794
	Mar	1322	0.0007	1.5242	0.0429	36.5093	0.0149	0.4392	0.0205	0.4693
	Apr	2383	0.0005	1.0353	0.0316	33.4989	0.0106	0.3273	0.0144	0.3174
	May	19866	0.0002	0.2015	0.0053	30.0921	0.0017	0.0468	0.0025	0.0483
	Jun	20343	0.0002	0.2153	0.0063	30.0937	0.0020	0.0585	0.0029	0.0537
	Jul	14218	0.0002	0.2482	0.0075	30.2986	0.0024	0.0709	0.0034	0.0645
	Aug	9990	0.0002	0.2920	0.0079	30.5428	0.0026	0.0739	0.0038	0.0772
	Sep	13419	0.0002	0.2330	0.0063	30.2852	0.0020	0.0570	0.0030	0.0585
	Oct	7050	0.0002	0.3368	0.0089	30.8909	0.0030	0.0825	0.0043	0.0910
	Nov	3273	0.0003	0.5555	0.0172	32.2863	0.0059	0.1722	0.0079	0.1642
	Dec	2478	0.0004	0.6915	0.0226	33.2551	0.0078	0.2308	0.0103	0.2101
	Total	97354								

Location	Mouth of Anvil Creek									
	Flows		Ag	Al	As	Ca	Cd	Cl	Co	Cu
	(x 1000 m ³)		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Jan	4514	0.0001	0.1166	0.0037	30.5835	0.0015	0.0250	0.0020	0.0237
	Feb	3315	0.0001	0.1311	0.0043	30.8184	0.0017	0.0305	0.0023	0.0289
	Mar	3357	0.0001	0.1490	0.0050	30.9289	0.0020	0.0381	0.0027	0.0349
	Apr	6328	0.0001	0.1219	0.0037	30.2965	0.0013	0.0272	0.0019	0.0250
	May	55377	0.0001	0.0735	0.0014	29.6788	0.0003	0.0039	0.0008	0.0077
	Jun	56866	0.0001	0.0747	0.0014	29.6767	0.0004	0.0048	0.0008	0.0081
	Jul	39674	0.0001	0.0765	0.0015	29.7134	0.0004	0.0057	0.0008	0.0088
	Aug	27785	0.0001	0.0782	0.0016	29.7588	0.0005	0.0060	0.0009	0.0094
	Sep	37386	0.0001	0.0751	0.0014	29.7136	0.0004	0.0047	0.0008	0.0083
	Oct	19529	0.0001	0.0801	0.0017	29.8244	0.0005	0.0067	0.0010	0.0101
	Nov	8917	0.0001	0.0931	0.0024	30.0834	0.0009	0.0140	0.0013	0.0150
	Dec	6631	0.0001	0.1017	0.0030	30.2739	0.0011	0.0191	0.0016	0.0184
	Total	269678.32								

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

FaroSite

Location	Mouth of Rose Creek										
	Flows (x 1000 m ³)		Fe	K	Mg	Mn	Na	Ni	Pb	SO4	Zn
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Jan	1725	14.9029	3.0713	19.4231	0.9124	6.9957	0.0174	0.0113	395.9173	6.4715
	Feb	1290	19.3652	3.5380	22.2145	1.1040	8.0224	0.0211	0.0135	484.7561	7.8701
	Mar	1322	24.0037	3.7322	23.6809	1.3562	8.4443	0.0245	0.0149	529.8697	9.7110
	Apr	2383	15.7269	2.4486	16.2950	0.9970	5.6155	0.0162	0.0096	296.3907	7.0905
	May	19866	2.4180	1.1116	7.7827	0.1659	2.6825	0.0032	0.0027	37.6529	1.0295
	Jun	20343	2.5788	1.1042	7.8003	0.1969	2.6654	0.0034	0.0028	37.1489	1.2553
	Jul	14218	3.0963	1.1889	8.3102	0.2329	2.8517	0.0041	0.0032	52.6209	1.5175
	Aug	9990	3.8936	1.2961	8.8991	0.2479	3.0884	0.0046	0.0036	72.1996	1.6271
	Sep	13419	2.9275	1.1922	8.2608	0.1963	2.8599	0.0037	0.0031	52.3745	1.2509
	Oct	7050	4.6691	1.4482	9.7498	0.2768	3.4239	0.0055	0.0042	99.2431	1.8383
	Nov	3273	8.0560	2.0222	13.2332	0.5350	4.6862	0.0100	0.0068	204.0066	3.7195
	Dec	2478	10.1429	2.4243	15.6508	0.7029	5.5709	0.0130	0.0086	276.6115	4.9423
	Total	97354									

Location	Mouth of Anvil Creek										
	Flows (x 1000 m ³)		Fe	K	Mg	Mn	Na	Ni	Pb	SO4	Zn
			mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	Jan	4514	1.0843	1.7464	11.4247	0.1002	4.0889	0.0045	0.0045	113.8	0.6447
	Feb	3315	1.3296	1.9449	12.5994	0.1168	4.5276	0.0053	0.0052	138.4	0.8024
	Mar	3357	1.6066	2.0313	13.1358	0.1386	4.7179	0.0058	0.0056	149.8	0.9965
	Apr	6328	1.1385	1.4927	9.9710	0.1059	3.5275	0.0037	0.0038	83.5	0.6889
	May	55377	0.3813	0.9887	6.9444	0.0388	2.4145	0.0014	0.0019	20.3	0.1151
	Jun	56866	0.3964	0.9851	6.9278	0.0413	2.4064	0.0014	0.0019	19.9	0.1326
	Jul	39674	0.4252	1.0156	7.1089	0.0441	2.4739	0.0016	0.0020	23.7	0.1559
	Aug	27785	0.4574	1.0555	7.3409	0.0451	2.5621	0.0017	0.0022	28.5	0.1701
	Sep	37386	0.4079	1.0178	7.1166	0.0411	2.4789	0.0015	0.0020	23.9	0.1351
	Oct	19529	0.4931	1.1120	7.6704	0.0473	2.6869	0.0019	0.0024	35.4	0.1920
	Nov	8917	0.6956	1.3258	8.9410	0.0681	3.1593	0.0028	0.0031	61.9	0.3621
	Dec	6631	0.8303	1.4834	9.8762	0.0824	3.5077	0.0035	0.0037	81.4	0.4781
	Total	269678.32									

VG_Site

Concentrations Estimates for Vangorda Creek Catchments

Loadings: Current Average Conditions

Concentrations at V27

	Flow (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	220	0.0003	0.053	0.004	31.069	0.002	0.015	0.003	0.012	0.115	3.372
Feb	172	0.0003	0.049	0.004	30.432	0.002	0.016	0.003	0.011	0.105	3.781
Mar	185	0.0003	0.046	0.005	30.005	0.002	0.017	0.003	0.011	0.098	4.026
Apr	301	0.0004	0.056	0.004	31.512	0.002	0.016	0.002	0.013	0.122	3.025
May	1991	0.0005	0.077	0.004	34.552	0.001	0.011	0.001	0.016	0.170	1.131
Jun	2033	0.0005	0.076	0.004	34.472	0.001	0.012	0.001	0.016	0.169	1.174
Jul	1435	0.0004	0.075	0.004	34.270	0.001	0.012	0.002	0.016	0.166	1.303
Aug	1013	0.0004	0.074	0.004	34.106	0.001	0.012	0.002	0.016	0.163	1.417
Sep	1348	0.0005	0.076	0.004	34.367	0.001	0.012	0.001	0.016	0.167	1.250
Oct	722	0.0004	0.072	0.004	33.849	0.001	0.012	0.002	0.015	0.159	1.590
Nov	365	0.0004	0.064	0.004	32.632	0.001	0.014	0.002	0.014	0.140	2.362
Dec	298	0.0004	0.060	0.004	31.976	0.002	0.014	0.002	0.013	0.129	2.777

Concentrations at V8

	Flow (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	410	0.0002	0.0287	0.0023	16.6670	0.0011	0.0080	0.0014	0.0065	0.0617	1.8078
Feb	312	0.0002	0.0272	0.0024	16.8220	0.0013	0.0086	0.0015	0.0063	0.0580	2.0893
Mar	328	0.0002	0.0262	0.0026	16.9853	0.0014	0.0095	0.0016	0.0061	0.0556	2.2782
Apr	571	0.0002	0.0298	0.0023	16.6102	0.0010	0.0085	0.0013	0.0067	0.0643	1.5936
May	4331	0.0002	0.0354	0.0017	15.8928	0.0003	0.0053	0.0007	0.0075	0.0783	0.5199
Jun	4443	0.0002	0.0349	0.0017	15.7850	0.0003	0.0055	0.0007	0.0074	0.0774	0.5375
Jul	3117	0.0002	0.0345	0.0017	15.7869	0.0003	0.0056	0.0007	0.0074	0.0763	0.6001
Aug	2190	0.0002	0.0342	0.0017	15.7857	0.0004	0.0056	0.0007	0.0073	0.0755	0.6555
Sep	2930	0.0002	0.0348	0.0017	15.8282	0.0003	0.0054	0.0007	0.0074	0.0771	0.5757
Oct	1549	0.0002	0.0336	0.0018	15.8005	0.0004	0.0057	0.0008	0.0072	0.0742	0.7417
Nov	743	0.0002	0.0314	0.0020	16.0406	0.0007	0.0068	0.0010	0.0069	0.0687	1.1603
Dec	578	0.0002	0.0307	0.0021	16.4775	0.0009	0.0074	0.0012	0.0068	0.0667	1.4305

VG_Site

Concentrations Estimates for Vangorda Creek Catch

Loadings: Current Average Conditions

Concentrations at V27

	Flow (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	220	10.226	0.025	7.854	0.013	0.011	15.890	0.043
Feb	172	10.049	0.026	8.736	0.014	0.013	15.862	0.046
Mar	185	9.958	0.027	9.259	0.015	0.013	16.109	0.049
Apr	301	10.409	0.024	7.097	0.012	0.010	16.499	0.042
May	1991	11.197	0.019	3.029	0.006	0.005	16.083	0.025
Jun	2033	11.191	0.019	3.120	0.006	0.005	16.253	0.026
Jul	1435	11.138	0.019	3.398	0.007	0.006	16.276	0.027
Aug	1013	11.086	0.019	3.643	0.007	0.006	16.213	0.028
Sep	1348	11.151	0.019	3.286	0.006	0.005	16.140	0.026
Oct	722	11.009	0.020	4.016	0.007	0.006	16.147	0.029
Nov	365	10.681	0.022	5.677	0.010	0.009	16.191	0.036
Dec	298	10.487	0.023	6.573	0.011	0.010	16.019	0.039

Concentrations at V8

	Flow (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	410	5.4855	0.0133	4.2115	0.0069	0.0061	8.5219	0.0231
Feb	312	5.5546	0.0143	4.8272	0.0078	0.0070	8.7660	0.0256
Mar	328	5.6367	0.0151	5.2393	0.0085	0.0075	9.1168	0.0279
Apr	571	5.4867	0.0126	3.7395	0.0063	0.0055	8.6947	0.0224
May	4331	5.1500	0.0085	1.3928	0.0028	0.0023	7.3958	0.0117
Jun	4443	5.1242	0.0086	1.4284	0.0028	0.0024	7.4401	0.0120
Jul	3117	5.1305	0.0088	1.5648	0.0030	0.0026	7.4955	0.0126
Aug	2190	5.1310	0.0090	1.6858	0.0032	0.0027	7.5021	0.0129
Sep	2930	5.1356	0.0087	1.5130	0.0029	0.0025	7.4314	0.0122
Oct	1549	5.1387	0.0093	1.8742	0.0035	0.0030	7.5351	0.0136
Nov	743	5.2502	0.0108	2.7895	0.0048	0.0042	7.9568	0.0175
Dec	578	5.4039	0.0119	3.3856	0.0057	0.0050	8.2526	0.0200

VG_Site

Loadings: Current Maximum Conditions (Revised to Future 2 in Dec2005)

Concentrations at V27

	Flow (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	230	0.0003	0.051	0.004	29.278	0.002	0.013	0.003	0.003	0.111	3.814
Feb	182	0.0003	0.047	0.004	28.406	0.003	0.013	0.003	0.003	0.101	4.266
Mar	196	0.0003	0.044	0.005	27.902	0.003	0.014	0.003	0.004	0.094	4.545
Apr	311	0.0003	0.055	0.004	30.066	0.002	0.014	0.003	0.003	0.119	3.443
May	1997	0.0005	0.076	0.004	34.294	0.001	0.011	0.001	0.002	0.170	1.214
Jun	2039	0.0005	0.076	0.004	34.205	0.001	0.012	0.002	0.002	0.168	1.267
Jul	1442	0.0004	0.074	0.004	33.906	0.001	0.012	0.002	0.002	0.165	1.423
Aug	1021	0.0004	0.073	0.004	33.634	0.001	0.012	0.002	0.002	0.162	1.559
Sep	1356	0.0004	0.075	0.004	34.016	0.001	0.011	0.002	0.002	0.166	1.359
Oct	731	0.0004	0.071	0.004	33.229	0.001	0.012	0.002	0.002	0.157	1.765
Nov	374	0.0004	0.062	0.004	31.494	0.002	0.012	0.002	0.003	0.137	2.671
Dec	308	0.0004	0.058	0.004	30.573	0.002	0.013	0.002	0.003	0.126	3.148
		0.0004	0.0636	0.0040		0.0015			0.0027		

Concentrations at V8

	Flow (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	410	0.0002	0.0287	0.0023	16.8103	0.0011	0.0097	0.0014	0.0065	0.0623	1.8132
Feb	312	0.0002	0.0272	0.0024	16.9913	0.0013	0.0106	0.0016	0.0063	0.0586	2.0956
Mar	328	0.0002	0.0262	0.0026	17.1891	0.0014	0.0118	0.0017	0.0061	0.0563	2.2858
Apr	571	0.0002	0.0298	0.0023	16.7673	0.0010	0.0103	0.0013	0.0067	0.0649	1.5994
May	4331	0.0002	0.0354	0.0017	15.9175	0.0003	0.0056	0.0007	0.0075	0.0784	0.5209
Jun	4443	0.0002	0.0349	0.0017	15.8157	0.0003	0.0058	0.0007	0.0074	0.0775	0.5386
Jul	3117	0.0002	0.0345	0.0017	15.8240	0.0003	0.0060	0.0007	0.0074	0.0765	0.6015
Aug	2190	0.0002	0.0342	0.0017	15.8244	0.0004	0.0061	0.0007	0.0073	0.0756	0.6570
Sep	2930	0.0002	0.0348	0.0017	15.8581	0.0003	0.0058	0.0007	0.0074	0.0772	0.5768
Oct	1549	0.0002	0.0336	0.0018	15.8436	0.0004	0.0062	0.0008	0.0072	0.0744	0.7433
Nov	743	0.0002	0.0314	0.0020	16.1278	0.0007	0.0078	0.0010	0.0069	0.0690	1.1636
Dec	578	0.0002	0.0307	0.0021	16.5913	0.0009	0.0087	0.0012	0.0068	0.0671	1.4347

VG_Site

Loadings: Current Maximum Conditions (Rev

Concentrations at V27

	Flow (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	230	9.707	0.028	8.835	0.014	0.013	14.478	0.046
Feb	182	9.460	0.030	9.812	0.015	0.014	14.244	0.049
Mar	196	9.355	0.031	10.413	0.016	0.015	14.324	0.052
Apr	311	10.012	0.027	8.028	0.013	0.012	15.185	0.045
May	1997	11.128	0.019	3.214	0.006	0.005	15.868	0.026
Jun	2039	11.123	0.020	3.327	0.006	0.005	16.005	0.027
Jul	1442	11.042	0.020	3.664	0.007	0.006	15.954	0.028
Aug	1021	10.956	0.021	3.958	0.007	0.006	15.835	0.029
Sep	1356	11.056	0.020	3.526	0.007	0.006	15.858	0.027
Oct	731	10.833	0.021	4.403	0.008	0.007	15.680	0.030
Nov	374	10.356	0.024	6.362	0.011	0.009	15.293	0.038
Dec	308	10.086	0.026	7.395	0.012	0.011	14.901	0.041
			0.0239		0.0102	0.0090		0.0365

Concentrations at V8

	Flow (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	410	5.7057	0.0155	4.2205	0.0072	0.0061	9.1393	0.0275
Feb	312	5.8147	0.0170	4.8378	0.0082	0.0070	9.4951	0.0308
Mar	328	5.9498	0.0183	5.2521	0.0089	0.0075	9.9945	0.0341
Apr	571	5.7280	0.0151	3.7494	0.0067	0.0055	9.3711	0.0272
May	4331	5.1878	0.0089	1.3943	0.0028	0.0023	7.5018	0.0125
Jun	4443	5.1714	0.0091	1.4304	0.0029	0.0024	7.5724	0.0129
Jul	3117	5.1875	0.0094	1.5672	0.0031	0.0026	7.6552	0.0137
Aug	2190	5.1904	0.0096	1.6883	0.0033	0.0027	7.6687	0.0141
Sep	2930	5.1815	0.0092	1.5149	0.0030	0.0025	7.5603	0.0131
Oct	1549	5.2049	0.0100	1.8769	0.0035	0.0030	7.7208	0.0149
Nov	743	5.3841	0.0122	2.7950	0.0050	0.0042	8.3323	0.0201
Dec	578	5.5787	0.0137	3.3927	0.0060	0.0050	8.7428	0.0234

VG_Site

Loadings: Future Worst Conditions (Revised to Future 3 in Dec2005)

Concentrations at V27

	Flow (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	230	0.0003	0.073	0.004	29.319	0.003	0.013	0.005	0.015	0.323	3.816
Feb	182	0.0003	0.071	0.004	28.453	0.003	0.014	0.005	0.016	0.342	4.268
Mar	196	0.0003	0.073	0.005	27.957	0.004	0.014	0.006	0.019	0.378	4.547
Apr	311	0.0003	0.079	0.004	30.113	0.003	0.014	0.005	0.016	0.359	3.445
May	1997	0.0005	0.081	0.004	34.302	0.001	0.011	0.002	0.005	0.214	1.215
Jun	2039	0.0005	0.082	0.004	34.215	0.001	0.012	0.002	0.005	0.224	1.268
Jul	1442	0.0004	0.081	0.004	33.918	0.001	0.012	0.002	0.006	0.231	1.424
Aug	1021	0.0004	0.080	0.004	33.648	0.001	0.012	0.002	0.006	0.231	1.560
Sep	1356	0.0004	0.081	0.004	34.026	0.001	0.011	0.002	0.005	0.220	1.359
Oct	731	0.0004	0.079	0.004	33.244	0.001	0.012	0.002	0.006	0.233	1.765
Nov	374	0.0004	0.077	0.004	31.522	0.002	0.013	0.004	0.011	0.280	2.672
Dec	308	0.0004	0.076	0.004	30.608	0.002	0.013	0.004	0.013	0.303	3.150
		0.0004	0.0777	0.0040		0.0019			0.0102		

Concentrations at V8

	Flow (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	410	0.0002	0.0495	0.0023	16.8500	0.0017	0.0100	0.0032	0.0176	0.2669	1.8151
Feb	312	0.0002	0.0517	0.0024	17.0382	0.0019	0.0110	0.0037	0.0193	0.3004	2.0978
Mar	328	0.0002	0.0558	0.0026	17.2455	0.0022	0.0123	0.0042	0.0218	0.3473	2.2884
Apr	571	0.0002	0.0526	0.0023	16.8108	0.0016	0.0107	0.0033	0.0188	0.2891	1.6015
May	4331	0.0002	0.0389	0.0017	15.9243	0.0004	0.0056	0.0010	0.0094	0.1136	0.5212
Jun	4443	0.0002	0.0394	0.0017	15.8242	0.0004	0.0059	0.0011	0.0098	0.1213	0.5390
Jul	3117	0.0002	0.0399	0.0017	15.8342	0.0005	0.0061	0.0012	0.0102	0.1294	0.6020
Aug	2190	0.0002	0.0398	0.0017	15.8351	0.0005	0.0062	0.0012	0.0103	0.1309	0.6575
Sep	2930	0.0002	0.0392	0.0017	15.8664	0.0004	0.0058	0.0011	0.0097	0.1199	0.5772
Oct	1549	0.0002	0.0399	0.0018	15.8555	0.0006	0.0063	0.0013	0.0106	0.1359	0.7439
Nov	743	0.0002	0.0441	0.0020	16.1519	0.0010	0.0080	0.0021	0.0136	0.1935	1.1647
Dec	578	0.0002	0.0472	0.0021	16.6229	0.0013	0.0089	0.0026	0.0156	0.2296	1.4362

VG_Site

Loadings: Future Worst Conditions (Revised)

Concentrations at V27

	Flow (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	230	9.983	0.214	8.837	0.016	0.013	17.087	0.551
Feb	182	9.775	0.241	9.814	0.017	0.014	17.212	0.624
Mar	196	9.724	0.279	10.415	0.019	0.015	17.808	0.727
Apr	311	10.324	0.237	8.030	0.015	0.012	18.134	0.616
May	1997	11.186	0.058	3.214	0.007	0.005	16.413	0.132
Jun	2039	11.196	0.068	3.327	0.007	0.005	16.689	0.159
Jul	1442	11.129	0.078	3.664	0.007	0.006	16.773	0.187
Aug	1021	11.046	0.081	3.959	0.008	0.006	16.683	0.193
Sep	1356	11.126	0.067	3.527	0.007	0.006	16.518	0.155
Oct	731	10.932	0.087	4.404	0.009	0.007	16.613	0.211
Nov	374	10.543	0.150	6.363	0.012	0.010	17.060	0.380
Dec	308	10.317	0.181	7.397	0.014	0.011	17.085	0.464
			0.1451		0.0114	0.0092		0.3665

Concentrations at V8

	Flow (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	410	5.9724	0.1946	4.2220	0.0090	0.0063	11.6572	0.5150
Feb	312	6.1297	0.2285	4.8396	0.0103	0.0071	12.4689	0.6066
Mar	328	6.3290	0.2729	5.2542	0.0114	0.0077	13.5740	0.7272
Apr	571	6.0202	0.2113	3.7511	0.0086	0.0057	12.1299	0.5613
May	4331	5.2336	0.0397	1.3946	0.0031	0.0024	7.9342	0.0962
Jun	4443	5.2286	0.0475	1.4307	0.0033	0.0024	8.1121	0.1174
Jul	3117	5.2565	0.0557	1.5675	0.0036	0.0026	8.3065	0.1398
Aug	2190	5.2624	0.0579	1.6887	0.0037	0.0028	8.3481	0.1457
Sep	2930	5.2372	0.0466	1.5152	0.0034	0.0025	8.0860	0.1149
Oct	1549	5.2851	0.0638	1.8774	0.0041	0.0030	8.4779	0.1615
Nov	743	5.5464	0.1211	2.7959	0.0061	0.0043	9.8638	0.3167
Dec	578	5.7905	0.1559	3.3939	0.0074	0.0051	10.7421	0.4105

Pelly River

Conditions: Current Average - Base Case

Location: Pelly River above Vangorda Creek

Month	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L	
Jan	83752		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Feb	60765		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Mar	57864		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Apr	71821		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
May	1152643		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Jun	1755415		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Jul	990512		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Aug	672737		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Sep	621684		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Oct	456449		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Nov	186178		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Dec	119473		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262

Total Flow at 09BC004 (Pelly River below Vangorda Creek)

Month	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	84162	9.00947E-07	0.00014	0.000585	34.95047	0.000503	0.32904	0.001002	0.004991	0.021634	0.013051
Feb	61077	9.13814E-07	0.000139	0.000586	34.94696	0.000504	0.328968	0.001003	0.00499	0.021624	0.014911
Mar	58192	9.92137E-07	0.000147	0.000588	34.93836	0.000505	0.328805	0.001004	0.00499	0.02163	0.017063
Apr	72392	1.50754E-06	0.000235	0.00059	34.89464	0.000504	0.328072	0.001002	0.004997	0.021775	0.016797
May	1156973	7.90444E-07	0.000132	0.000581	34.96833	0.000499	0.329394	0.000999	0.004993	0.02165	0.006193
Jun	1759858	5.2784E-07	8.82E-05	0.000579	34.99139	0.000499	0.329791	0.000999	0.00499	0.021579	0.005608
Jul	993630	6.50191E-07	0.000108	0.00058	34.9796	0.000499	0.329593	0.000999	0.004991	0.02161	0.006132
Aug	674927	6.66756E-07	0.000111	0.00058	34.97753	0.0005	0.329558	0.000999	0.004991	0.021613	0.006375
Sep	624614	9.78125E-07	0.000163	0.000582	34.94988	0.000499	0.329087	0.000999	0.004995	0.021698	0.006943
Oct	457998	6.86851E-07	0.000114	0.000581	34.97494	0.0005	0.329514	0.000999	0.004991	0.021616	0.006756
Nov	186921	7.73019E-07	0.000125	0.000582	34.9645	0.000501	0.329325	0.001	0.004991	0.021625	0.008856
Dec	120051	9.30199E-07	0.000148	0.000584	34.95067	0.000502	0.329057	0.001001	0.004992	0.021655	0.011126

Pelly River

Conditions: Current Average - Base Case

Location: Pelly River above Vangorda Creek

Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	83752	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Feb	60765	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Mar	57864	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Apr	71821	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
May	1152643	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Jun	1755415	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Jul	990512	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Aug	672737	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Sep	621684	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Oct	456449	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Nov	186178	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Dec	119473	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364

Total Flow at 09BC004 (Pelly River below V

Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	84162	10.42665	0.013996	1.521174	0.001029	0.004271	32.50257	0.008435
Feb	61077	10.42584	0.014002	1.524951	0.001035	0.004276	32.49818	0.008452
Mar	58192	10.42375	0.014006	1.529005	0.001042	0.004281	32.48769	0.008473
Apr	72392	10.41169	0.013989	1.5256	0.001042	0.004272	32.4313	0.008474
May	1156973	10.431	0.01398	1.507569	0.001007	0.004255	32.52558	0.008376
Jun	1759858	10.4374	0.013986	1.507799	0.001005	0.004258	32.55643	0.008373
Jul	993630	10.43416	0.013984	1.508178	0.001006	0.004257	32.54118	0.008377
Aug	674927	10.43359	0.013984	1.508577	0.001007	0.004257	32.53851	0.008378
Sep	624614	10.42591	0.013975	1.508024	0.001009	0.004254	32.50184	0.008382
Oct	457998	10.43288	0.013984	1.509238	0.001008	0.004258	32.53517	0.008381
Nov	186921	10.43018	0.013987	1.513093	0.001015	0.004262	32.52199	0.0084
Dec	120051	10.42656	0.01399	1.517036	0.001023	0.004266	32.50273	0.008419

Pelly River

Pelly R upstream of Anvil Creek

Month	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	84590	8.96383E-07	0.000139	0.000585	34.95092	0.000503	0.329048	0.001002	0.004991	0.021633	0.013006
Feb	61389	9.09169E-07	0.000138	0.000586	34.94743	0.000504	0.328976	0.001003	0.00499	0.021623	0.014856
Mar	58507	9.86798E-07	0.000147	0.000588	34.93891	0.000505	0.328814	0.001004	0.00499	0.021629	0.016994
Apr	72999	1.495E-06	0.000233	0.00059	34.89585	0.000504	0.328093	0.001002	0.004997	0.021773	0.016693
May	1162394	7.86757E-07	0.000132	0.000581	34.96866	0.000499	0.3294	0.000999	0.004993	0.021649	0.006184
Jun	1765434	5.26173E-07	8.79E-05	0.000579	34.99154	0.000499	0.329794	0.000999	0.00499	0.021578	0.005604
Jul	997517	6.47658E-07	0.000108	0.00058	34.97984	0.000499	0.329597	0.000999	0.004991	0.021609	0.006124
Aug	677645	6.64081E-07	0.00011	0.00058	34.97779	0.0005	0.329562	0.000999	0.004991	0.021612	0.006367
Sep	628274	9.72427E-07	0.000162	0.000582	34.9504	0.000499	0.329096	0.000999	0.004995	0.021697	0.006927
Oct	459905	6.84003E-07	0.000113	0.000581	34.97521	0.0005	0.329518	0.000999	0.004991	0.021615	0.006746
Nov	187785	7.69463E-07	0.000124	0.000582	34.96484	0.000501	0.329331	0.001	0.004991	0.021624	0.008835
Dec	120687	9.25295E-07	0.000147	0.000584	34.95114	0.000502	0.329065	0.001001	0.004992	0.021654	0.01109

Total Flow in Pelly River just below Anvil Creek

Month	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	89119	6.94748E-06	0.005072	0.000646	34.61438	0.000521	0.312463	0.00102	0.005514	0.066583	0.099641
Feb	64721	7.40105E-06	0.005784	0.000658	34.58987	0.000531	0.312206	0.001032	0.005725	0.079978	0.11227
Mar	61889	8.25185E-06	0.006831	0.000673	34.5516	0.000539	0.311061	0.001043	0.005977	0.096468	0.124605
Apr	79355	1.10255E-05	0.008198	0.000677	34.40004	0.000521	0.302048	0.00102	0.005834	0.09394	0.133074
May	1217737	5.41904E-06	0.003325	0.000604	34.71963	0.000488	0.314456	0.000984	0.005036	0.036615	0.050722
Jun	1822267	3.71514E-06	0.002279	0.000595	34.82023	0.000492	0.319529	0.000989	0.005019	0.031762	0.036074
Jul	1037173	4.57702E-06	0.002828	0.000601	34.76851	0.000491	0.317023	0.000988	0.00504	0.034832	0.04459
Aug	705426	4.75977E-06	0.003006	0.000603	34.75748	0.000492	0.316614	0.000989	0.005071	0.037134	0.047498
Sep	665642	6.72114E-06	0.004163	0.000612	34.64129	0.000487	0.310657	0.000982	0.005068	0.041373	0.063489
Oct	479436	4.9661E-06	0.003186	0.000606	34.74377	0.000494	0.31613	0.000991	0.0051	0.039321	0.051507
Nov	196711	5.72624E-06	0.003806	0.000619	34.69323	0.000502	0.314458	0.000999	0.00521	0.046831	0.067995
Dec	127328	6.75527E-06	0.004556	0.000634	34.62767	0.00051	0.31201	0.001007	0.005315	0.054526	0.086933

Pelly River

Pelly R upstream of Anvil Creek

Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	84590	10.42677	0.013996	1.521107	0.001029	0.004271	32.50317	0.008435
Feb	61389	10.42597	0.014002	1.524865	0.001035	0.004276	32.4988	0.008451
Mar	58507	10.42389	0.014006	1.528892	0.001042	0.004281	32.4884	0.008473
Apr	72999	10.41202	0.013989	1.525454	0.001042	0.004272	32.43287	0.008473
May	1162394	10.4311	0.01398	1.507571	0.001007	0.004255	32.52602	0.008376
Jun	1765434	10.43744	0.013986	1.5078	0.001005	0.004258	32.55663	0.008373
Jul	997517	10.43422	0.013984	1.508178	0.001006	0.004257	32.54149	0.008377
Aug	677645	10.43366	0.013984	1.508575	0.001007	0.004257	32.53884	0.008378
Sep	628274	10.42606	0.013975	1.508024	0.001009	0.004254	32.50253	0.008382
Oct	459905	10.43296	0.013984	1.509233	0.001008	0.004258	32.53552	0.008381
Nov	187785	10.43028	0.013987	1.513069	0.001015	0.004262	32.52244	0.0084
Dec	120687	10.42669	0.01399	1.516988	0.001022	0.004266	32.50335	0.008419

Total Flow in Pelly River just below Anvil C

Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	89119	10.26279	0.015386	1.648538	0.001179	0.004276	32.17845	0.015189
Feb	64721	10.26768	0.015607	1.675314	0.001222	0.004313	32.50013	0.01698
Mar	61889	10.26037	0.015932	1.697941	0.00126	0.004335	32.6636	0.019524
Apr	79355	10.14094	0.016208	1.682005	0.001213	0.004216	31.34428	0.019553
May	1217737	10.2568	0.014712	1.548558	0.001022	0.004149	31.15125	0.009899
Jun	1822267	10.31768	0.014495	1.535673	0.001015	0.004184	31.60966	0.009489
Jul	1037173	10.28848	0.014625	1.544839	0.001023	0.004171	31.41787	0.009904
Aug	705426	10.28464	0.014665	1.549681	0.00103	0.004174	31.43175	0.010115
Sep	665642	10.21234	0.014904	1.562138	0.001034	0.004128	30.85726	0.010475
Oct	479436	10.28053	0.014714	1.556662	0.00104	0.004179	31.46183	0.01038
Nov	196711	10.26869	0.014946	1.586525	0.001084	0.004205	31.63124	0.011962
Dec	127328	10.24795	0.015204	1.618841	0.001129	0.004227	31.73543	0.013546

Pelly River

At 09BC001 (Pelly River at Pelly Crossing)											
Month	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	184810	3.35023E-06	0.002446	0.00061	34.83476	0.00051	0.32186	0.00101	0.005239	0.043208	0.050256
Feb	135464	3.53602E-06	0.002763	0.000616	34.82494	0.000515	0.321818	0.001015	0.005338	0.049406	0.055865
Mar	133384	3.82877E-06	0.003169	0.000621	34.81339	0.000518	0.321541	0.00102	0.005445	0.056251	0.0601
Apr	169517	5.16131E-06	0.003838	0.000623	34.74042	0.00051	0.317241	0.001009	0.005382	0.055377	0.064562
May	2070403	3.18728E-06	0.001956	0.000593	34.85157	0.000493	0.32111	0.000991	0.005015	0.030364	0.031588
Jun	3473280	1.94916E-06	0.001195	0.000587	34.9247	0.000496	0.324797	0.000994	0.005002	0.026855	0.020952
Jul	1990051	2.38545E-06	0.001474	0.000589	34.89851	0.000496	0.32353	0.000994	0.005013	0.028418	0.025281
Aug	1352592	2.4824E-06	0.001568	0.00059	34.89266	0.000496	0.323312	0.000994	0.005029	0.029624	0.026811
Sep	1192320	3.75224E-06	0.002324	0.000596	34.81741	0.000493	0.319472	0.00099	0.005031	0.032567	0.037327
Oct	875837	2.71846E-06	0.001744	0.000593	34.87784	0.000497	0.322684	0.000995	0.005047	0.031227	0.030124
Nov	388800	2.89716E-06	0.001926	0.000598	34.86455	0.000501	0.322439	0.001	0.005098	0.034285	0.036508
Dec	265697	3.23728E-06	0.002184	0.000604	34.8424	0.000505	0.321697	0.001003	0.005142	0.037295	0.04388

Conditions	Current Maximum - Base Case (Revised to Future 2 in Dec 2005)												
Location	Pelly River above Vangorda Creek												
	Month	Flows (x 1000 m³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L	
	Jan	83752		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
	Feb	60765		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
	Mar	57864		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
	Apr	71821		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
	May	1152643		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
	Jun	1755415		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
	Jul	990512		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
	Aug	672737		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
	Sep	621684		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
	Oct	456449		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
	Nov	186178		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Dec	119473		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262	

Pelly River

At 09BC001 (Pelly River at Pelly Crossing)									
Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L	
Jan	184810	10.36016	0.014668	1.575771	0.001086	0.004269	32.40707	0.011655	
Feb	135464	10.36334	0.014768	1.587938	0.001106	0.004286	32.56273	0.01248	
Mar	133384	10.36247	0.014896	1.596131	0.001121	0.004296	32.64023	0.013542	
Apr	169517	10.30577	0.015034	1.589456	0.0011	0.004241	32.02281	0.013602	
May	2070403	10.33672	0.014419	1.531855	0.001013	0.004196	31.75614	0.009267	
Jun	3473280	10.38098	0.01426	1.522518	0.001008	0.004221	32.08992	0.008954	
Jul	1990051	10.36622	0.014326	1.5272	0.001012	0.004215	31.99348	0.009167	
Aug	1352592	10.36416	0.014347	1.529738	0.001016	0.004216	32.00028	0.009277	
Sep	1192320	10.3177	0.014505	1.538224	0.001019	0.004188	31.6359	0.009542	
Oct	875837	10.35761	0.014391	1.534638	0.001022	0.004217	31.98601	0.009468	
Nov	388800	10.35869	0.014479	1.547729	0.001042	0.004233	32.11974	0.010184	
Dec	265697	10.35362	0.014577	1.561118	0.001062	0.004245	32.1961	0.010847	

Conditions	Current Maximum - Base Case (Revised to)								
Location	Pelly River above Vangorda Creek								
Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L	
Jan	83752	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364	
Feb	60765	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364	
Mar	57864	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364	
Apr	71821	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364	
May	1152643	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364	
Jun	1755415	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364	
Jul	990512	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364	
Aug	672737	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364	
Sep	621684	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364	
Oct	456449	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364	
Nov	186178	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364	
Dec	119473	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364	

Pelly River

Total Flow at 09BC004 (Pelly River below Vangorda Creek)

Month	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	84162	9.00947E-07	0.00014	0.000585	34.95117	0.000503	0.329048	0.001002	0.004991	0.021636	0.013077
Feb	61077	9.13814E-07	0.000139	0.000586	34.94782	0.000504	0.328978	0.001003	0.00499	0.021627	0.014943
Mar	58192	9.92137E-07	0.000148	0.000588	34.93951	0.000505	0.328818	0.001004	0.00499	0.021634	0.017106
Apr	72392	1.50754E-06	0.000235	0.00059	34.89588	0.000504	0.328086	0.001002	0.004997	0.02178	0.016844
May	1156973	7.90444E-07	0.000132	0.000581	34.96842	0.000499	0.329395	0.000999	0.004993	0.021651	0.006196
Jun	1759858	5.2784E-07	8.82E-05	0.000579	34.99147	0.000499	0.329792	0.000999	0.00499	0.021579	0.005611
Jul	993630	6.50191E-07	0.000108	0.00058	34.97972	0.000499	0.329594	0.000999	0.004991	0.02161	0.006136
Aug	674927	6.66756E-07	0.000111	0.00058	34.97766	0.0005	0.329559	0.000999	0.004991	0.021613	0.00638
Sep	624614	9.78125E-07	0.000163	0.000582	34.95002	0.000499	0.329088	0.000999	0.004995	0.021699	0.006948
Oct	457998	6.86851E-07	0.000114	0.000581	34.97508	0.0005	0.329515	0.000999	0.004991	0.021617	0.006761
Nov	186921	7.73019E-07	0.000125	0.000582	34.96484	0.000501	0.329329	0.001	0.004991	0.021627	0.008869
Dec	120051	9.30199E-07	0.000148	0.000584	34.95122	0.000502	0.329063	0.001001	0.004992	0.021657	0.011146

Pelly R upstream of Anvil Creek

Month	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	84590	8.96383E-07	0.000139	0.000585	34.95162	0.000503	0.329056	0.001002	0.004991	0.021635	0.013032
Feb	61389	9.09169E-07	0.000138	0.000586	34.94829	0.000504	0.328986	0.001003	0.00499	0.021627	0.014889
Mar	58507	9.86798E-07	0.000147	0.000588	34.94005	0.000505	0.328827	0.001004	0.00499	0.021633	0.017037
Apr	72999	1.495E-06	0.000233	0.00059	34.89708	0.000504	0.328107	0.001002	0.004997	0.021777	0.016739
May	1162394	7.86757E-07	0.000132	0.000581	34.96875	0.000499	0.329401	0.000999	0.004993	0.02165	0.006187
Jun	1765434	5.26173E-07	8.79E-05	0.000579	34.99162	0.000499	0.329795	0.000999	0.00499	0.021579	0.005607
Jul	997517	6.47658E-07	0.000108	0.00058	34.97995	0.000499	0.329598	0.000999	0.004991	0.021609	0.006129
Aug	677645	6.64081E-07	0.00011	0.00058	34.97791	0.0005	0.329564	0.000999	0.004991	0.021613	0.006371
Sep	628274	9.72427E-07	0.000162	0.000582	34.95054	0.000499	0.329097	0.000999	0.004995	0.021697	0.006933
Oct	459905	6.84003E-07	0.000113	0.000581	34.97535	0.0005	0.32952	0.000999	0.004991	0.021616	0.006751
Nov	187785	7.69463E-07	0.000124	0.000582	34.96519	0.000501	0.329335	0.001	0.004991	0.021626	0.008848
Dec	120687	9.25295E-07	0.000147	0.000584	34.95168	0.000502	0.329071	0.001001	0.004992	0.021656	0.01111

Pelly River

Total Flow at 09BC004 (Pelly River below V

Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	84162	10.42773	0.014007	1.521217	0.00103	0.004271	32.50558	0.008457
Feb	61077	10.42717	0.014015	1.525006	0.001037	0.004276	32.5019	0.008478
Mar	58192	10.42551	0.014024	1.529077	0.001045	0.004281	32.49263	0.008509
Apr	72392	10.4136	0.014008	1.525678	0.001045	0.004272	32.43663	0.008512
May	1156973	10.43115	0.013981	1.507575	0.001007	0.004255	32.52597	0.008379
Jun	1759858	10.43752	0.013988	1.507804	0.001005	0.004258	32.55676	0.008375
Jul	993630	10.43434	0.013986	1.508186	0.001007	0.004257	32.54168	0.00838
Aug	674927	10.43378	0.013986	1.508585	0.001007	0.004257	32.53905	0.008382
Sep	624614	10.42613	0.013977	1.508032	0.001009	0.004254	32.50245	0.008386
Oct	457998	10.43311	0.013986	1.509248	0.001009	0.004258	32.5358	0.008386
Nov	186921	10.43071	0.013993	1.513114	0.001016	0.004262	32.52348	0.00841
Dec	120051	10.4274	0.013999	1.51707	0.001024	0.004266	32.50509	0.008436

Pelly R upstream of Anvil Creek

Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	84590	10.42784	0.014007	1.52115	0.00103	0.004271	32.50616	0.008456
Feb	61389	10.42729	0.014015	1.524919	0.001036	0.004276	32.5025	0.008478
Mar	58507	10.42565	0.014024	1.528964	0.001044	0.004281	32.49331	0.008508
Apr	72999	10.41391	0.014008	1.525531	0.001044	0.004272	32.43816	0.008511
May	1162394	10.43124	0.013981	1.507577	0.001007	0.004255	32.52641	0.008379
Jun	1765434	10.43756	0.013988	1.507805	0.001005	0.004258	32.55696	0.008375
Jul	997517	10.4344	0.013986	1.508185	0.001007	0.004257	32.54199	0.00838
Aug	677645	10.43385	0.013986	1.508583	0.001007	0.004257	32.53938	0.008382
Sep	628274	10.42627	0.013978	1.508032	0.001009	0.004254	32.50313	0.008386
Oct	459905	10.43318	0.013986	1.509242	0.001009	0.004258	32.53615	0.008386
Nov	187785	10.4308	0.013993	1.513091	0.001016	0.004262	32.52392	0.00841
Dec	120687	10.42752	0.013999	1.517022	0.001024	0.004266	32.5057	0.008436

Pelly River

Total Flow in Pelly River just below Anvil Creek

Month	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	89119	1.0487E-05	0.012826	0.00069	34.75767	0.000536	0.312862	0.001071	0.007671	0.205925	0.099991
Feb	64721	1.23652E-05	0.016631	0.000716	34.77083	0.00055	0.312699	0.001101	0.008738	0.275485	0.112702
Mar	61889	1.48826E-05	0.021317	0.000749	34.76298	0.000565	0.311713	0.001135	0.01	0.357618	0.125177
Apr	79355	1.6665E-05	0.020573	0.000748	34.56429	0.000544	0.302731	0.001101	0.009281	0.315899	0.133673
May	1217737	5.83949E-06	0.004249	0.000609	34.73091	0.00049	0.314509	0.00099	0.005294	0.053161	0.050769
Jun	1822267	3.99254E-06	0.002892	0.0006	34.82772	0.000493	0.319574	0.000993	0.005191	0.042667	0.036113
Jul	1037173	4.99755E-06	0.003758	0.000607	34.78166	0.000493	0.317091	0.000994	0.0053	0.051364	0.04465
Aug	705426	5.39936E-06	0.004407	0.000611	34.77642	0.000495	0.316687	0.000998	0.005461	0.062312	0.047561
Sep	665642	7.37023E-06	0.005588	0.00062	34.66079	0.00049	0.310737	0.000991	0.005465	0.066918	0.063558
Oct	479436	5.80907E-06	0.005028	0.000616	34.77102	0.000497	0.316214	0.001003	0.005612	0.07252	0.051581
Nov	196711	7.26353E-06	0.007185	0.00064	34.75642	0.000509	0.314657	0.001022	0.006152	0.107321	0.06817
Dec	127328	8.95114E-06	0.009395	0.000665	34.72783	0.00052	0.312322	0.001039	0.006666	0.140898	0.087207

At 09BC001 (Pelly River at Pelly Crossing)

Month	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	184810	2.96001E-06	0.001736	0.000604	34.85839	0.000508	0.321848	0.001006	0.005035	0.030352	0.051459
Feb	135464	3.00424E-06	0.001779	0.000608	34.85491	0.000512	0.321811	0.00101	0.005057	0.031545	0.05735
Mar	133384	3.13702E-06	0.001892	0.000611	34.84774	0.000515	0.321543	0.001012	0.00508	0.03308	0.061794
Apr	169517	4.54273E-06	0.002737	0.000613	34.76709	0.000506	0.317239	0.001003	0.005065	0.035489	0.06597
May	2070403	3.13076E-06	0.001855	0.000592	34.85373	0.000493	0.3211	0.00099	0.004984	0.028509	0.03174
Jun	3473280	1.9137E-06	0.001135	0.000586	34.92594	0.000496	0.324791	0.000994	0.004984	0.025762	0.021047
Jul	1990051	2.33209E-06	0.001383	0.000588	34.90072	0.000495	0.323522	0.000993	0.004986	0.026771	0.025432
Aug	1352592	2.40671E-06	0.00143	0.000589	34.89599	0.000496	0.323305	0.000993	0.004989	0.027116	0.027009
Sep	1192320	3.66944E-06	0.002175	0.000595	34.82101	0.000492	0.31946	0.000989	0.004987	0.029845	0.037558
Oct	875837	2.61607E-06	0.001554	0.000591	34.88294	0.000496	0.322677	0.000994	0.004993	0.027758	0.030405
Nov	388800	2.71503E-06	0.001602	0.000595	34.87533	0.0005	0.322428	0.000998	0.005004	0.028428	0.037088
Dec	265697	2.98568E-06	0.001744	0.0006	34.8585	0.000503	0.321681	0.001001	0.005014	0.029366	0.044743

Pelly River

Total Flow in Pelly River just below Anvil C

Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	89119	10.345	0.017548	1.651012	0.001225	0.004293	35.91704	0.028782
Feb	64721	10.37098	0.018488	1.678374	0.001284	0.004335	37.23312	0.035331
Mar	61889	10.38166	0.019765	1.701986	0.001342	0.004365	38.18461	0.043963
Apr	79355	10.23773	0.01976	1.686243	0.00129	0.004244	35.59236	0.041726
May	1217737	10.26352	0.014981	1.548886	0.001028	0.004151	31.4417	0.011573
Jun	1822267	10.32231	0.014696	1.535953	0.00102	0.004186	31.79962	0.010706
Jul	1037173	10.29646	0.014927	1.545257	0.00103	0.004174	31.75369	0.011735
Aug	705426	10.29571	0.015057	1.550132	0.001038	0.004177	31.92321	0.012577
Sep	665642	10.22382	0.015315	1.562632	0.001043	0.004132	31.36151	0.013038
Oct	479436	10.29618	0.015204	1.557185	0.00105	0.004183	32.17346	0.013501
Nov	196711	10.30534	0.015944	1.58776	0.001105	0.004213	33.27286	0.018145
Dec	127328	10.30617	0.016692	1.620778	0.001161	0.004239	34.33414	0.022678

At 09BC001 (Pelly River at Pelly Crossing)

Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	184810	10.39041	0.014482	1.578689	0.001086	0.004271	32.8	0.010607
Feb	135464	10.40116	0.01452	1.591575	0.001106	0.004289	33.0	0.011218
Mar	133384	10.40475	0.014576	1.600378	0.00112	0.004299	33.1	0.011923
Apr	169517	10.33768	0.014734	1.593071	0.001098	0.004243	32.5	0.01184
May	2070403	10.33929	0.014391	1.532203	0.001013	0.004196	32.1	0.009095
Jun	3473280	10.38244	0.014241	1.522742	0.001008	0.004222	32.3	0.008819
Jul	1990051	10.36891	0.014298	1.52756	0.001012	0.004215	32.2	0.008968
Aug	1352592	10.36823	0.014311	1.530209	0.001015	0.004216	32.3	0.009071
Sep	1192320	10.32209	0.014464	1.53876	0.001019	0.004188	32.0	0.009298
Oct	875837	10.36395	0.014343	1.535303	0.001022	0.004217	32.3	0.009221
Nov	388800	10.37248	0.014389	1.549128	0.001042	0.004235	32.4	0.009626
Dec	265697	10.37446	0.01445	1.563198	0.001062	0.004247	32.6	0.01001

Pelly River

2.95112E-06 0.001752 0.000598 0.000501 0.005015

Conditions:	Future Worst Case - Base Case (Revised to Future 3 in Dec2005)											
Location	Pelly River above Vangorda Creek											
Month	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L	
Jan	83752		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Feb	60765		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Mar	57864		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Apr	71821		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
May	1152643		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Jun	1755415		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Jul	990512		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Aug	672737		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Sep	621684		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Oct	456449		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Nov	186178		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Dec	119473		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984	0.021438	0.004262
Total Flow at 09BC004 (Pelly River below Vangorda Creek)												
Month	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L	
Jan	84162	9.00947E-07	0.000241	0.000585	34.95136	0.000506	0.32905	0.001011	0.005045	0.022634	0.013086	
Feb	61077	9.13814E-07	0.000264	0.000586	34.94806	0.000507	0.32898	0.001014	0.005057	0.022862	0.014954	
Mar	58192	9.92137E-07	0.000314	0.000588	34.93983	0.000509	0.32882	0.001018	0.005078	0.023272	0.017121	
Apr	72392	1.50754E-06	0.000415	0.00059	34.89622	0.000508	0.328089	0.001018	0.005092	0.023549	0.01686	
May	1156973	7.90444E-07	0.000146	0.000581	34.96844	0.0005	0.329396	0.001	0.005	0.021782	0.006197	
Jun	1759858	5.2784E-07	9.95E-05	0.000579	34.99149	0.0005	0.329792	0.001	0.004996	0.02169	0.005612	
Jul	993630	6.50191E-07	0.000125	0.00058	34.97975	0.0005	0.329594	0.001001	0.005	0.021776	0.006137	
Aug	674927	6.66756E-07	0.000129	0.00058	34.97769	0.0005	0.32956	0.001001	0.005001	0.021792	0.006381	
Sep	624614	9.78125E-07	0.000184	0.000582	34.95006	0.0005	0.329089	0.001	0.005006	0.021899	0.00695	
Oct	457998	6.86851E-07	0.000135	0.000581	34.97512	0.0005	0.329516	0.001001	0.005002	0.021825	0.006763	
Nov	186921	7.73019E-07	0.000175	0.000582	34.96494	0.000502	0.32933	0.001004	0.005018	0.022121	0.008874	
Dec	120051	9.30199E-07	0.000227	0.000584	34.95137	0.000504	0.329064	0.001008	0.005035	0.022439	0.011154	

Pelly River

0.014433

0.00105

0.004237

0.009975

Conditions: Future Worst Case - Base Case (Revised to

Location Pelly River above Vangorda Creek

Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	83752	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Feb	60765	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Mar	57864	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Apr	71821	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
May	1152643	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Jun	1755415	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Jul	990512	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Aug	672737	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Sep	621684	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Oct	456449	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Nov	186178	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
Dec	119473	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364

Total Flow at 09BC004 (Pelly River below V

Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	84162	10.42902	0.01488	1.521225	0.001039	0.004272	32.51785	0.010832
Feb	61077	10.42878	0.015095	1.525015	0.001047	0.004277	32.51709	0.011419
Mar	58192	10.42764	0.015457	1.529089	0.001059	0.004282	32.51278	0.01241
Apr	72392	10.4159	0.015556	1.525691	0.00106	0.004273	32.45839	0.012725
May	1156973	10.43132	0.014096	1.507575	0.001008	0.004255	32.52759	0.008692
Jun	1759858	10.43766	0.014084	1.507805	0.001006	0.004258	32.55813	0.008639
Jul	993630	10.43455	0.014131	1.508187	0.001008	0.004257	32.54373	0.008776
Aug	674927	10.43401	0.014142	1.508586	0.001009	0.004257	32.54126	0.008809
Sep	624614	10.42639	0.014153	1.508034	0.001011	0.004254	32.50491	0.008863
Oct	457998	10.43338	0.014168	1.509249	0.00101	0.004258	32.53836	0.008881
Nov	186921	10.43136	0.014426	1.513118	0.00102	0.004262	32.52957	0.009589
Dec	120051	10.42842	0.014683	1.517076	0.001031	0.004267	32.51471	0.010299

Pelly River**Pelly R upstream of Anvil Creek**

Month	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	84590	8.96383E-07	0.00024	0.000585	34.95181	0.000506	0.329058	0.001011	0.005045	0.022628	0.013041
Feb	61389	9.09169E-07	0.000263	0.000586	34.94853	0.000507	0.328988	0.001014	0.005057	0.022855	0.0149
Mar	58507	9.86798E-07	0.000312	0.000588	34.94037	0.000509	0.32883	0.001018	0.005078	0.023262	0.017052
Apr	72999	1.495E-06	0.000411	0.00059	34.89742	0.000508	0.32811	0.001018	0.005091	0.023531	0.016755
May	1162394	7.86757E-07	0.000145	0.000581	34.96878	0.0005	0.329401	0.001	0.005	0.021781	0.006188
Jun	1765434	5.26173E-07	9.92E-05	0.000579	34.99164	0.0005	0.329795	0.001	0.004996	0.021689	0.005608
Jul	997517	6.47658E-07	0.000125	0.00058	34.97999	0.0005	0.329598	0.001001	0.005	0.021775	0.00613
Aug	677645	6.64081E-07	0.000129	0.00058	34.97794	0.0005	0.329564	0.001001	0.005001	0.021791	0.006373
Sep	628274	9.72427E-07	0.000183	0.000582	34.95058	0.0005	0.329098	0.001	0.005006	0.021897	0.006934
Oct	459905	6.84003E-07	0.000134	0.000581	34.97539	0.0005	0.32952	0.001001	0.005002	0.021823	0.006753
Nov	187785	7.69463E-07	0.000174	0.000582	34.96528	0.000502	0.329336	0.001004	0.005018	0.022118	0.008853
Dec	120687	9.25295E-07	0.000226	0.000584	34.95183	0.000504	0.329072	0.001008	0.005034	0.022434	0.011117

Total Flow in Pelly River just below Anvil Creek

Month	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	89119	1.37076E-05	0.021145	0.001152	34.78015	0.000684	0.318079	0.001244	0.010692	0.318184	0.100795
Feb	64721	1.63877E-05	0.027003	0.001288	34.7991	0.000733	0.319152	0.001317	0.012497	0.415876	0.113697
Mar	61889	2.02049E-05	0.035039	0.001506	34.7959	0.000807	0.320244	0.00142	0.014972	0.543393	0.126491
Apr	79355	2.21542E-05	0.034763	0.001541	34.58997	0.000797	0.311668	0.001399	0.014439	0.507103	0.135051
May	1217737	6.26367E-06	0.005346	0.000671	34.73267	0.00051	0.315201	0.001013	0.005693	0.067931	0.050875
Jun	1822267	4.35002E-06	0.003819	0.000652	34.8289	0.00051	0.320167	0.001013	0.005529	0.055089	0.036205
Jul	1037173	5.52988E-06	0.005138	0.000685	34.78373	0.000518	0.317972	0.001023	0.005803	0.069864	0.044785
Aug	705426	5.98522E-06	0.005921	0.000695	34.77938	0.000522	0.317636	0.00103	0.00601	0.082732	0.047707
Sep	665642	8.00953E-06	0.007241	0.000712	34.66384	0.00052	0.311778	0.001026	0.006066	0.089185	0.063719
Oct	479436	6.49525E-06	0.006797	0.000713	34.77527	0.000529	0.317315	0.001039	0.006253	0.096467	0.051751
Nov	196711	8.8558E-06	0.011304	0.00087	34.76637	0.000583	0.317261	0.001108	0.007651	0.162751	0.068571
Dec	127328	1.14346E-05	0.015826	0.001027	34.74365	0.000636	0.316406	0.001175	0.009008	0.227286	0.087836

Pelly River

Pelly R upstream of Anvil Creek

Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	84590	10.42914	0.014876	1.521158	0.001039	0.004272	32.51837	0.01082
Feb	61389	10.42889	0.01509	1.524928	0.001047	0.004277	32.51761	0.011403
Mar	58507	10.42777	0.01545	1.528976	0.001058	0.004282	32.51336	0.012388
Apr	72999	10.41619	0.015543	1.525544	0.001059	0.004273	32.45974	0.012689
May	1162394	10.43141	0.014096	1.507577	0.001008	0.004255	32.52802	0.008691
Jun	1765434	10.4377	0.014084	1.507805	0.001006	0.004258	32.55832	0.008638
Jul	997517	10.43462	0.01413	1.508186	0.001008	0.004257	32.54402	0.008774
Aug	677645	10.43408	0.014142	1.508584	0.001009	0.004257	32.54157	0.008807
Sep	628274	10.42653	0.014152	1.508034	0.001011	0.004254	32.50558	0.00886
Oct	459905	10.43345	0.014168	1.509244	0.00101	0.004258	32.5387	0.008879
Nov	187785	10.43145	0.014424	1.513095	0.00102	0.004262	32.52998	0.009583
Dec	120687	10.42854	0.014679	1.517028	0.00103	0.004267	32.51527	0.010289

Total Flow in Pelly River just below Anvil C

Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	89119	10.48068	0.032668	1.650514	0.001358	0.004328	38.52771	0.136311
Feb	64721	10.54088	0.037205	1.677758	0.001449	0.004379	40.50273	0.16844
Mar	61889	10.58121	0.04451	1.701172	0.00156	0.004423	42.05219	0.219945
Apr	79355	10.39845	0.045653	1.68539	0.001517	0.004304	38.75994	0.225863
May	1217737	10.27471	0.016987	1.54882	0.001046	0.004156	31.66411	0.025837
Jun	1822267	10.33013	0.01641	1.535897	0.001035	0.00419	31.95767	0.022895
Jul	1037173	10.30987	0.017477	1.545173	0.001052	0.00418	32.02113	0.02987
Aug	705426	10.31403	0.017809	1.550041	0.001063	0.004183	32.28256	0.032147
Sep	665642	10.24288	0.018333	1.562533	0.001069	0.004139	31.73669	0.034501
Oct	479436	10.32194	0.018398	1.557079	0.001078	0.00419	32.67264	0.036216
Nov	196711	10.36611	0.023485	1.587511	0.001171	0.004231	34.44844	0.071774
Dec	127328	10.40287	0.028517	1.620388	0.001265	0.004266	36.20236	0.106769

Pelly River

At 09BC001 (Pelly River at Pelly Crossing)

Month	Flows (x 1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L	K mg/L
Jan	184810	3.44165E-06	0.002937	0.000656	34.88899	0.000526	0.322422	0.001028	0.005449	0.04775	0.051553
Feb	135464	3.61952E-06	0.003305	0.000672	34.893	0.000534	0.322515	0.001037	0.005578	0.053856	0.057465
Mar	133384	3.92978E-06	0.003857	0.000693	34.89034	0.000542	0.322447	0.001048	0.005751	0.061835	0.061943
Apr	169517	5.32598E-06	0.004697	0.0007	34.79974	0.000535	0.318194	0.001039	0.005742	0.063723	0.066126
May	2070403	3.20614E-06	0.002044	0.0006	34.8565	0.000496	0.321193	0.000994	0.00505	0.031223	0.031756
Jun	3473280	1.96737E-06	0.001271	0.000592	34.92755	0.000498	0.324862	0.000997	0.005032	0.027681	0.021059
Jul	1990051	2.41177E-06	0.001585	0.000598	34.9036	0.000498	0.323627	0.000997	0.005056	0.029622	0.025449
Aug	1352592	2.5013E-06	0.001666	0.000599	34.90021	0.000499	0.323418	0.000998	0.00507	0.030533	0.027027
Sep	1192320	3.77791E-06	0.002447	0.000607	34.82565	0.000496	0.319593	0.000994	0.005081	0.033754	0.037579
Oct	875837	2.73616E-06	0.001852	0.000604	34.88943	0.0005	0.322814	0.000999	0.005095	0.032112	0.030427
Nov	388800	2.95689E-06	0.002209	0.000622	34.88943	0.000509	0.322729	0.001009	0.005215	0.03713	0.037138
Dec	265697	3.3358E-06	0.002626	0.00064	34.87977	0.000517	0.322128	0.001018	0.005321	0.04193	0.044816
Average		3.26752E-06	0.002541	0.000632		0.000513			0.005287		

Pelly River

At 09BC001 (Pelly River at Pelly Crossing)

Month	Flows (x 1000 m ³)	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	184810	10.4636	0.016339	1.578653	0.001103	0.004276	34.6	0.024573
Feb	135464	10.49211	0.016806	1.591531	0.001127	0.004295	35.2	0.028609
Mar	133384	10.50668	0.017511	1.600322	0.001147	0.004307	35.5	0.034281
Apr	169517	10.41655	0.017818	1.593011	0.001127	0.00425	34.4	0.03487
May	2070403	10.34602	0.01469	1.532197	0.001016	0.004197	32.2	0.011327
Jun	3473280	10.3864	0.014468	1.522738	0.00101	0.004222	32.4	0.010481
Jul	1990051	10.37595	0.014634	1.527553	0.001015	0.004216	32.4	0.011427
Aug	1352592	10.37839	0.014676	1.530202	0.001019	0.004217	32.5	0.011817
Sep	1192320	10.33329	0.014892	1.538752	0.001023	0.004189	32.3	0.012495
Oct	875837	10.37948	0.01479	1.535295	0.001026	0.004218	32.6	0.012619
Nov	388800	10.40632	0.015358	1.549109	0.001051	0.004237	33.2	0.016825
Dec	265697	10.42557	0.015887	1.563171	0.001075	0.00425	33.8	0.020605
Average			0.015656		0.001062	0.004239		0.019161

APPENDIX A-3

PREDICTED WATER QUALITY DATA FOR THE “TREAT ALL FLOWS” SCENARIO

Grum Vangoda Site

Concentrations Estimates for Vangorda Creek Catchments

Loadings: Future Worst Conditions

Concentrations at V27

	Flow (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	232	0.0003	0.051	0.004	57.437	0.002	0.007	0.003	0.012	0.109
Feb	184	0.0003	0.046	0.004	60.675	0.003	0.006	0.003	0.011	0.099
Mar	198	0.0003	0.043	0.004	62.737	0.003	0.006	0.003	0.011	0.092
Apr	313	0.0003	0.054	0.004	54.931	0.002	0.007	0.003	0.012	0.117
May	1998	0.0005	0.076	0.004	38.626	0.001	0.010	0.001	0.016	0.169
Jun	2041	0.0004	0.076	0.004	39.036	0.001	0.010	0.002	0.016	0.168
Jul	1444	0.0004	0.074	0.004	40.176	0.001	0.010	0.002	0.016	0.164
Aug	1023	0.0004	0.073	0.004	41.146	0.001	0.010	0.002	0.016	0.161
Sep	1357	0.0004	0.075	0.004	39.681	0.001	0.010	0.002	0.016	0.166
Oct	733	0.0004	0.071	0.004	42.622	0.001	0.009	0.002	0.015	0.156
Nov	377	0.0004	0.062	0.004	49.223	0.002	0.008	0.002	0.014	0.135
Dec	310	0.0004	0.057	0.004	52.678	0.002	0.007	0.003	0.013	0.124
Average		0.0004	0.0631	0.0039		0.0015			0.0140	

Concentrations at V8

	Flow (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	Fe mg/L
Jan	416	0.0002	0.0282	0.0023	32.0766	0.0013	0.0037	0.0016	0.0066	0.0610
Feb	318	0.0002	0.0267	0.0025	35.1118	0.0015	0.0036	0.0018	0.0064	0.0573
Mar	333	0.0002	0.0257	0.0026	37.3128	0.0017	0.0034	0.0019	0.0063	0.0550
Apr	574	0.0002	0.0295	0.0022	30.0047	0.0012	0.0038	0.0015	0.0068	0.0641
May	4322	0.0002	0.0353	0.0017	17.8563	0.0003	0.0046	0.0007	0.0075	0.0782
Jun	4431	0.0002	0.0349	0.0017	17.9762	0.0003	0.0046	0.0007	0.0075	0.0773
Jul	3111	0.0002	0.0344	0.0017	18.6533	0.0004	0.0045	0.0007	0.0074	0.0762
Aug	2189	0.0002	0.0340	0.0017	19.2331	0.0004	0.0045	0.0008	0.0073	0.0753
Sep	2926	0.0002	0.0347	0.0017	18.4053	0.0004	0.0045	0.0007	0.0074	0.0769
Oct	1551	0.0002	0.0335	0.0018	20.1527	0.0005	0.0045	0.0008	0.0073	0.0739
Nov	747	0.0002	0.0311	0.0020	24.8171	0.0008	0.0042	0.0011	0.0070	0.0683
Dec	583	0.0002	0.0304	0.0021	28.0175	0.0010	0.0040	0.0013	0.0069	0.0662

Grum Vangoda Site

Concentrations Estimates for Vangorda Creek (

Loadings: Future Worst Conditions

Concentrations at V27

	Flow (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	232	3.946	91.893	0.026	9.141	0.013	0.013	590.987	0.037
Feb	184	4.411	103.606	0.027	10.149	0.015	0.014	674.618	0.039
Mar	198	4.707	111.064	0.028	10.792	0.016	0.015	727.854	0.040
Apr	313	3.586	82.826	0.025	8.361	0.012	0.012	526.233	0.035
May	1998	1.244	23.847	0.019	3.283	0.006	0.005	105.163	0.024
Jun	2041	1.303	25.334	0.019	3.410	0.006	0.006	115.810	0.025
Jul	1444	1.467	29.457	0.019	3.765	0.007	0.006	145.254	0.025
Aug	1023	1.606	32.967	0.020	4.067	0.007	0.006	170.322	0.026
Sep	1357	1.396	27.667	0.019	3.611	0.007	0.006	132.457	0.025
Oct	733	1.818	38.307	0.020	4.527	0.008	0.007	208.454	0.027
Nov	377	2.766	62.187	0.023	6.582	0.010	0.010	378.951	0.031
Dec	310	3.263	74.678	0.024	7.659	0.012	0.011	468.071	0.033
Average				0.0223		0.0099	0.0093		0.0306

Concentrations at V8

	Flow (x1000 m ³)	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	416	2.2038	51.3193	0.0143	5.1050	0.0075	0.0072	330.0473	0.0204
Feb	318	2.5527	59.9558	0.0155	5.8734	0.0085	0.0083	390.3942	0.0224
Mar	333	2.7997	66.0557	0.0164	6.4185	0.0092	0.0090	432.8938	0.0238
Apr	574	1.9588	45.2417	0.0135	4.5670	0.0068	0.0065	287.4436	0.0190
May	4322	0.5752	11.0243	0.0087	1.5177	0.0028	0.0025	48.6157	0.0112
Jun	4431	0.6001	11.6665	0.0087	1.5705	0.0029	0.0025	53.3305	0.0113
Jul	3111	0.6811	13.6767	0.0090	1.7481	0.0031	0.0028	67.4400	0.0118
Aug	2189	0.7508	15.4100	0.0092	1.9011	0.0033	0.0030	79.6143	0.0122
Sep	2926	0.6474	12.8326	0.0089	1.6750	0.0030	0.0027	61.4373	0.0116
Oct	1551	0.8597	18.1125	0.0096	2.1402	0.0036	0.0033	98.5622	0.0128
Nov	747	1.3947	31.3531	0.0114	3.3187	0.0052	0.0049	191.0560	0.0158
Dec	583	1.7352	39.7185	0.0127	4.0737	0.0062	0.0059	248.9496	0.0178

Faro Site

Summary Tables

Conditions: Base Case Future Worst Loadings

Location	X2	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Jan	591	0.0001	0.0659	0.0010	29.5950	0.0002	0.0002	0.0006	0.0045
	Feb	422	0.0001	0.0659	0.0010	29.5950	0.0002	0.0002	0.0006	0.0045
	Mar	421	0.0001	0.0659	0.0010	29.5950	0.0002	0.0002	0.0006	0.0045
	Apr	853	0.0001	0.0659	0.0010	29.5950	0.0002	0.0002	0.0006	0.0045
	May	7982	0.0001	0.0659	0.0010	29.5950	0.0002	0.0002	0.0006	0.0045
	Jun	8127	0.0001	0.0659	0.0010	29.5950	0.0002	0.0002	0.0006	0.0045
	Jul	5634	0.0001	0.0659	0.0010	29.5950	0.0002	0.0002	0.0006	0.0045
	Aug	3919	0.0001	0.0659	0.0010	29.5950	0.0002	0.0002	0.0006	0.0045
	Sep	5334	0.0001	0.0659	0.0010	29.5950	0.0002	0.0002	0.0006	0.0045
	Oct	2730	0.0001	0.0659	0.0010	29.5950	0.0002	0.0002	0.0006	0.0045
	Nov	1210	0.0001	0.0659	0.0010	29.5950	0.0002	0.0002	0.0006	0.0045
	Dec	900	0.0001	0.0659	0.0010	29.5950	0.0002	0.0002	0.0006	0.0045
	Total	38122								
Location	X14	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Jan	1302	0.0001	0.0424	0.0027	47.6364	0.0022	0.0001	0.0025	0.0047
	Feb	981	0.0001	0.0374	0.0030	51.4134	0.0026	0.0001	0.0028	0.0048
	Mar	1004	0.0001	0.0354	0.0032	52.9840	0.0028	0.0001	0.0030	0.0048
	Apr	1759	0.0001	0.0491	0.0022	42.5141	0.0016	0.0001	0.0019	0.0047
	May	14341	0.0001	0.0638	0.0012	31.2328	0.0004	0.0002	0.0008	0.0045
	Jun	14654	0.0001	0.0639	0.0011	31.1461	0.0004	0.0002	0.0008	0.0045
	Jul	10258	0.0001	0.0629	0.0012	31.8847	0.0005	0.0002	0.0008	0.0045
	Aug	7221	0.0001	0.0617	0.0013	32.8475	0.0006	0.0002	0.0009	0.0045
	Sep	9693	0.0001	0.0628	0.0012	31.9400	0.0005	0.0002	0.0008	0.0045
	Oct	5114	0.0001	0.0599	0.0014	34.1876	0.0007	0.0002	0.0011	0.0046
	Nov	2406	0.0001	0.0536	0.0019	39.0410	0.0013	0.0002	0.0016	0.0046
	Dec	1846	0.0001	0.0493	0.0022	42.3174	0.0016	0.0001	0.0019	0.0046
	Total	70579								
	Average of X2 & X14		0.0001	0.0597	0.0014		0.0007			0.0046

Faro Site

Summary Tables

Conditions: Base Case Future Worst Loadings

Location	X2	Flows (x1000 m ³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
	Jan	591	0.2641	0.9211	6.5358	0.0283	2.2653	0.0011	0.0017	0.0038	0.0256
	Feb	422	0.2641	0.9211	6.5358	0.0283	2.2653	0.0011	0.0017	0.0038	0.0256
	Mar	421	0.2641	0.9211	6.5358	0.0283	2.2653	0.0011	0.0017	0.0038	0.0256
	Apr	853	0.2641	0.9211	6.5358	0.0283	2.2653	0.0011	0.0017	0.0038	0.0256
	May	7982	0.2641	0.9211	6.5358	0.0283	2.2653	0.0011	0.0017	0.0038	0.0256
	Jun	8127	0.2641	0.9211	6.5358	0.0283	2.2653	0.0011	0.0017	0.0038	0.0256
	Jul	5634	0.2641	0.9211	6.5358	0.0283	2.2653	0.0011	0.0017	0.0038	0.0256
	Aug	3919	0.2641	0.9211	6.5358	0.0283	2.2653	0.0011	0.0017	0.0038	0.0256
	Sep	5334	0.2641	0.9211	6.5358	0.0283	2.2653	0.0011	0.0017	0.0038	0.0256
	Oct	2730	0.2641	0.9211	6.5358	0.0283	2.2653	0.0011	0.0017	0.0038	0.0256
	Nov	1210	0.2641	0.9211	6.5358	0.0283	2.2653	0.0011	0.0017	0.0038	0.0256
	Dec	900	0.2641	0.9211	6.5358	0.0283	2.2653	0.0011	0.0017	0.0038	0.0256
	Total	38122									
Location	X14	Flows (x1000 m ³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
	Jan	1302	0.1593	3.9953	52.6869	0.0316	9.0669	0.0112	0.0115	893.7783	0.0379
	Feb	981	0.1373	4.6389	62.3489	0.0323	10.4909	0.0133	0.0136	1,080.8938	0.0405
	Mar	1004	0.1282	4.9065	66.3666	0.0326	11.0830	0.0141	0.0144	1,158.7020	0.0415
	Apr	1759	0.1890	3.1225	39.5838	0.0307	7.1358	0.0083	0.0087	640.0200	0.0344
	May	14341	0.2546	1.2002	10.7254	0.0286	2.8828	0.0020	0.0026	81.1411	0.0267
	Jun	14654	0.2551	1.1854	10.5036	0.0286	2.8501	0.0020	0.0025	76.8460	0.0267
	Jul	10258	0.2508	1.3113	12.3930	0.0287	3.1285	0.0024	0.0029	113.4366	0.0272
	Aug	7221	0.2452	1.4753	14.8558	0.0289	3.4915	0.0029	0.0035	161.1319	0.0278
	Sep	9693	0.2505	1.3207	12.5344	0.0287	3.1494	0.0024	0.0030	116.1742	0.0272
	Oct	5114	0.2374	1.7037	18.2840	0.0291	3.9967	0.0037	0.0042	227.5217	0.0287
	Nov	2406	0.2092	2.5307	30.6994	0.0300	5.8265	0.0064	0.0068	467.9617	0.0320
	Dec	1846	0.1902	3.0890	39.0805	0.0307	7.0617	0.0082	0.0086	630.2734	0.0343
	Total	70579									
	Average of X2 & X14					0.0292		0.0037	0.0043		0.0288

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

Faro Site

Location	Mouth of Rose Creek		Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Flows (x1000 m ³)									
	Jan	1738	0.0001	0.0483	0.0023	43.1125	0.0017	0.0001	0.0020	0.0047
	Feb	1298	0.0001	0.0444	0.0025	46.0806	0.0020	0.0001	0.0023	0.0047
	Mar	1324	0.0001	0.0428	0.0027	47.3297	0.0022	0.0001	0.0024	0.0047
	Apr	2377	0.0001	0.0534	0.0019	39.1587	0.0013	0.0002	0.0016	0.0046
	May	19853	0.0001	0.0644	0.0011	30.7781	0.0003	0.0002	0.0007	0.0045
	Jun	20323	0.0001	0.0644	0.0011	30.7134	0.0003	0.0002	0.0007	0.0045
	Jul	14210	0.0001	0.0637	0.0012	31.2478	0.0004	0.0002	0.0008	0.0045
	Aug	9986	0.0001	0.0628	0.0012	31.9471	0.0005	0.0002	0.0008	0.0045
	Sep	13414	0.0001	0.0637	0.0012	31.2894	0.0004	0.0002	0.0008	0.0045
	Oct	7053	0.0001	0.0616	0.0013	32.9249	0.0006	0.0002	0.0009	0.0045
	Nov	3285	0.0001	0.0569	0.0016	36.5149	0.0010	0.0002	0.0013	0.0046
	Dec	2493	0.0001	0.0536	0.0019	39.0160	0.0013	0.0002	0.0016	0.0046
	Total	97354								

Location	Mouth of Anvil Creek		Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Flows (x1000 m ³)									
	Jan	4542	0.0001	0.0592	0.0015	34.7665	0.0008	0.0002	0.0011	0.0046
	Feb	3341	0.0001	0.0575	0.0016	36.0020	0.0009	0.0002	0.0013	0.0046
	Mar	3385	0.0001	0.0569	0.0016	36.5337	0.0010	0.0002	0.0013	0.0046
	Apr	6349	0.0001	0.0612	0.0013	33.1747	0.0006	0.0002	0.0010	0.0045
	May	55329	0.0001	0.0653	0.0010	30.0195	0.0002	0.0002	0.0006	0.0045
	Jun	56814	0.0001	0.0654	0.0010	29.9951	0.0002	0.0002	0.0006	0.0045
	Jul	39649	0.0001	0.0651	0.0011	30.1874	0.0003	0.0002	0.0007	0.0045
	Aug	27777	0.0001	0.0648	0.0011	30.4406	0.0003	0.0002	0.0007	0.0045
	Sep	37364	0.0001	0.0651	0.0011	30.2033	0.0003	0.0002	0.0007	0.0045
	Oct	19534	0.0001	0.0643	0.0011	30.7974	0.0003	0.0002	0.0007	0.0045
	Nov	8938	0.0001	0.0626	0.0012	32.1380	0.0005	0.0002	0.0009	0.0045
	Dec	6657	0.0001	0.0613	0.0013	33.1233	0.0006	0.0002	0.0010	0.0045
	Total	269759								

Appendix A: Anvil Range Mine Tier 2 Risk Assessment of Remediation Scenarios

Faro Site

Location	Mouth of Rose Creek									
	Flows (x1000 m ³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	1738	0.1855	3.2245	41.1145	0.0308	7.3614	0.0086	0.0090	669.6633	0.0348
Feb	1298	0.1683	3.7302	48.7072	0.0313	8.4804	0.0103	0.0107	816.7060	0.0368
Mar	1324	0.1610	3.9431	51.9024	0.0316	8.9513	0.0110	0.0113	878.5852	0.0377
Apr	2377	0.2085	2.5507	31.0003	0.0301	5.8708	0.0064	0.0069	473.7904	0.0321
May	19853	0.2572	1.1227	9.5622	0.0285	2.7113	0.0018	0.0023	58.6132	0.0264
Jun	20323	0.2576	1.1117	9.3967	0.0285	2.6869	0.0017	0.0023	55.4090	0.0264
Jul	14210	0.2545	1.2027	10.7639	0.0286	2.8884	0.0020	0.0026	81.8854	0.0267
Aug	9986	0.2504	1.3219	12.5526	0.0287	3.1520	0.0024	0.0030	116.5269	0.0272
Sep	13414	0.2543	1.2098	10.8703	0.0286	2.9041	0.0020	0.0026	83.9470	0.0268
Oct	7053	0.2447	1.4885	15.0541	0.0289	3.5207	0.0030	0.0035	164.9706	0.0279
Nov	3285	0.2239	2.1002	24.2374	0.0296	4.8741	0.0050	0.0055	342.8171	0.0303
Dec	2493	0.2094	2.5264	30.6354	0.0300	5.8170	0.0064	0.0068	466.7225	0.0320
Total	97354									

Location	Mouth of Anvil Creek									
	Flows (x1000 m ³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan	4542	0.2340	1.8023	19.7649	0.0293	4.2150	0.0040	0.0045	256.2018	0.0291
Feb	3341	0.2269	2.0128	22.9253	0.0295	4.6807	0.0047	0.0052	317.4078	0.0300
Mar	3385	0.2238	2.1034	24.2855	0.0296	4.8812	0.0050	0.0055	343.7485	0.0303
Apr	6349	0.2433	1.5311	15.6930	0.0290	3.6149	0.0031	0.0036	177.3454	0.0280
May	55329	0.2616	0.9934	7.6217	0.0284	2.4253	0.0013	0.0019	21.0337	0.0259
Jun	56814	0.2618	0.9893	7.5592	0.0284	2.4161	0.0013	0.0019	19.8234	0.0259
Jul	39649	0.2607	1.0220	8.0511	0.0284	2.4886	0.0014	0.0020	29.3503	0.0260
Aug	27777	0.2592	1.0652	8.6988	0.0285	2.5841	0.0016	0.0022	41.8934	0.0262
Sep	37364	0.2606	1.0248	8.0919	0.0284	2.4946	0.0014	0.0020	30.1403	0.0260
Oct	19534	0.2571	1.1260	9.6116	0.0285	2.7186	0.0018	0.0024	59.5707	0.0264
Nov	8938	0.2493	1.3544	13.0410	0.0288	3.2240	0.0025	0.0031	125.9843	0.0273
Dec	6657	0.2436	1.5223	15.5615	0.0290	3.5955	0.0031	0.0036	174.7982	0.0280
Total	269759									

Pelly River

Conditions Future Worst Case - Base Case

Location Pelly River above Vangorda Creek

Month	Flows (x1000 m³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L	
Jan	83752		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984
Feb	60765		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984
Mar	57864		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984
Apr	71821		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984
May	1152643		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984
Jun	1755415		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984
Jul	990512		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984
Aug	672737		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984
Sep	621684		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984
Oct	456449		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984
Nov	186178		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984
Dec	119473		0	0	0.000577	35.04	0.0005	0.330612	0.001	0.004984

Location Total Flow at 09BC004 (Pelly River below Vangorda Creek)

Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
Jan	84168	8.7007E-07	0.00014	0.000585	35.02535	0.000504	0.328996	0.001003	0.004992
Feb	61083	8.76703E-07	0.000139	0.000586	35.04037	0.000505	0.328912	0.001004	0.004991
Mar	58197	9.40825E-07	0.000147	0.000588	35.05301	0.000507	0.328739	0.001005	0.004991
Apr	72395	1.44422E-06	0.000234	0.00059	35.00011	0.000505	0.328023	0.001004	0.004998
May	1156965	7.82649E-07	0.000132	0.000581	34.9758	0.000499	0.329394	0.000999	0.004993
Jun	1759846	5.2163E-07	8.78E-05	0.000579	34.99703	0.0005	0.329791	0.000999	0.00499
Jul	993623	6.41699E-07	0.000108	0.00058	34.98869	0.0005	0.329591	0.000999	0.004991
Aug	674926	6.58198E-07	0.00011	0.00058	34.98874	0.0005	0.329555	0.000999	0.004991
Sep	624610	9.67448E-07	0.000163	0.000582	34.96206	0.000499	0.329085	0.000999	0.004995
Oct	458000	6.77823E-07	0.000113	0.000581	34.98959	0.0005	0.329508	0.000999	0.004991
Nov	186925	7.55354E-07	0.000124	0.000582	34.99915	0.000501	0.329308	0.001001	0.004992
Dec	120056	9.03884E-07	0.000147	0.000584	35.00592	0.000503	0.329027	0.001002	0.004993

Pelly River

Conditions		Future Worst Case - Base Case									
Location	Pelly River above Vangorda Creek										
	Month	Flows (x1000 m ³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
	Jan	83752	0.021438	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
	Feb	60765	0.021438	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
	Mar	57864	0.021438	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
	Apr	71821	0.021438	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
	May	1152643	0.021438	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
	Jun	1755415	0.021438	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
	Jul	990512	0.021438	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
	Aug	672737	0.021438	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
	Sep	621684	0.021438	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
	Oct	456449	0.021438	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
	Nov	186178	0.021438	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
	Dec	119473	0.021438	0.004262	10.45085	0.014	1.508	0.001	0.004262	32.62	0.008364
	Location	Total Flow at 09BC004 (Pelly River below Vangorda Creek)									
Month		Flows (x1000 m ³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
Jan		84168	0.021633	0.015135	10.65287	0.014002	1.525781	0.001032	0.004277	34.09028	0.008423
Feb		61083	0.021624	0.017512	10.70824	0.014008	1.530697	0.001039	0.004283	34.48016	0.008437
Mar		58197	0.02163	0.020263	10.76913	0.014014	1.536108	0.001047	0.004289	34.91118	0.008452
Apr		72395	0.021775	0.019748	10.72649	0.013996	1.532236	0.001046	0.00428	34.63896	0.008448
May		1156965	0.02165	0.006395	10.45299	0.01398	1.508036	0.001007	0.004256	32.67976	0.008374
Jun		1759846	0.021578	0.005763	10.45391	0.013987	1.508157	0.001005	0.004258	32.67215	0.008371
Jul		993623	0.021609	0.006381	10.46095	0.013984	1.508752	0.001007	0.004258	32.72902	0.008374
Aug		674926	0.021612	0.006683	10.46693	0.013984	1.509275	0.001008	0.004258	32.77239	0.008376
Sep		624610	0.021697	0.007276	10.46201	0.013976	1.508782	0.00101	0.004255	32.75501	0.008379
Oct		458000	0.021615	0.007159	10.47679	0.013985	1.510141	0.001009	0.004259	32.84331	0.008379
Nov		186925	0.021625	0.009819	10.53438	0.01399	1.515236	0.001017	0.004265	33.25314	0.008393
Dec		120056	0.021655	0.012664	10.5929	0.013994	1.520453	0.001025	0.00427	33.66995	0.008409

Pelly River

Location	Pelly R upstream of Anvil Creek									
	Month	Flows (x1000 m³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Jan	84596	8.65663E-07	0.000139	0.000585	35.02543	0.000504	0.329005	0.001003	0.004992
	Feb	61395	8.72246E-07	0.000138	0.000586	35.04037	0.000505	0.32892	0.001004	0.004991
	Mar	58512	9.35762E-07	0.000147	0.000588	35.05294	0.000507	0.328749	0.001005	0.004991
	Apr	73002	1.43221E-06	0.000232	0.00059	35.00044	0.000505	0.328045	0.001004	0.004998
	May	1162386	7.78999E-07	0.000131	0.000581	34.9761	0.000499	0.3294	0.000999	0.004993
	Jun	1765422	5.19982E-07	8.75E-05	0.000579	34.99717	0.0005	0.329794	0.000999	0.00499
	Jul	997511	6.39198E-07	0.000107	0.00058	34.98889	0.0005	0.329595	0.000999	0.004991
	Aug	677644	6.55557E-07	0.00011	0.00058	34.98895	0.0005	0.329559	0.000999	0.004991
	Sep	628270	9.61812E-07	0.000162	0.000582	34.96252	0.000499	0.329093	0.000999	0.004995
	Oct	459907	6.75012E-07	0.000113	0.000581	34.98979	0.0005	0.329512	0.000999	0.004991
	Nov	187789	7.51879E-07	0.000124	0.000582	34.99934	0.000501	0.329314	0.001001	0.004991
	Dec	120692	8.99119E-07	0.000147	0.000584	35.0061	0.000503	0.329035	0.001002	0.004993
Location	Total Flow in Pelly River just below Anvil Creek									
	Month	Flows (x1000 m³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Jan	89138	5.91663E-06	0.003146	0.000631	35.01223	0.000518	0.31225	0.001009	0.00497
	Feb	64736	5.98772E-06	0.0031	0.000639	35.09	0.000527	0.311955	0.001017	0.00497
	Mar	61897	6.35327E-06	0.003248	0.000646	35.13392	0.000532	0.31078	0.001022	0.004969
	Apr	79351	9.31935E-06	0.005113	0.000649	34.85435	0.000513	0.30181	0.001001	0.004962
	May	1217715	5.28728E-06	0.003094	0.000602	34.75089	0.000488	0.314442	0.000983	0.004971
	Jun	1822236	3.62158E-06	0.002123	0.000594	34.84121	0.000492	0.319518	0.000988	0.004975
	Jul	1037160	4.43761E-06	0.002593	0.000598	34.80534	0.000491	0.317003	0.000986	0.004973
	Aug	705421	4.56737E-06	0.002657	0.0006	34.80985	0.000492	0.31659	0.000987	0.004972
	Sep	665634	6.52114E-06	0.003807	0.000609	34.69537	0.000486	0.310631	0.00098	0.004968
	Oct	479441	4.72178E-06	0.002729	0.000602	34.81898	0.000493	0.316095	0.000988	0.004972
	Nov	196727	5.26113E-06	0.002962	0.000612	34.86933	0.000501	0.31436	0.000994	0.00497
	Dec	127348	6.07931E-06	0.003343	0.000623	34.90768	0.000507	0.311845	0.001	0.004969

Pelly River

Location	Pelly R upstream of Anvil Creek										
	Month	Flows (x1000 m³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
	Jan	84596	0.021632	0.01508	10.65185	0.014002	1.525691	0.001032	0.004277	34.08283	0.008423
	Feb	61395	0.021623	0.017445	10.70693	0.014008	1.530581	0.001039	0.004283	34.4707	0.008436
	Mar	58512	0.021629	0.020177	10.76742	0.014014	1.535956	0.001047	0.004289	34.89885	0.008451
	Apr	73002	0.021773	0.01962	10.7242	0.013996	1.532035	0.001046	0.00428	34.62217	0.008447
	May	1162386	0.021649	0.006385	10.45298	0.01398	1.508036	0.001007	0.004256	32.67948	0.008374
	Jun	1765422	0.021578	0.005758	10.4539	0.013987	1.508157	0.001005	0.004258	32.67198	0.008371
	Jul	997511	0.021608	0.006373	10.46091	0.013984	1.508749	0.001007	0.004258	32.7286	0.008374
	Aug	677644	0.021611	0.006673	10.46686	0.013985	1.509269	0.001008	0.004258	32.77178	0.008376
	Sep	628270	0.021696	0.007258	10.46194	0.013976	1.508778	0.001009	0.004255	32.75423	0.008379
	Oct	459907	0.021615	0.007147	10.47669	0.013985	1.510132	0.001009	0.004259	32.84238	0.008378
	Nov	187789	0.021624	0.009793	10.53399	0.01399	1.515202	0.001017	0.004265	33.25023	0.008393
	Dec	120692	0.021654	0.012619	10.59215	0.013994	1.520387	0.001025	0.00427	33.66442	0.008409
Location	Total Flow in Pelly River just below Anvil Creek										
	Month	Flows (x1000 m³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
	Jan	89138	0.032455	0.106141	11.11617	0.014779	1.662712	0.001182	0.004289	45.39995	0.009478
	Feb	64736	0.032215	0.120417	11.33746	0.014806	1.693145	0.001226	0.004329	49.07165	0.009547
	Mar	61897	0.032683	0.134104	11.50668	0.014865	1.718897	0.001261	0.004354	51.78886	0.009648
	Apr	79351	0.039498	0.140563	11.1218	0.015194	1.698698	0.00121	0.004229	46.04251	0.010015
	May	1217715	0.032553	0.051234	10.32434	0.014634	1.549715	0.001022	0.00415	32.15033	0.00917
	Jun	1822236	0.029067	0.036422	10.36365	0.014435	1.536466	0.001015	0.004185	32.27139	0.008917
	Jul	1037160	0.030747	0.0452	10.36879	0.014536	1.546208	0.001023	0.004172	32.59945	0.009048
	Aug	705421	0.030966	0.048354	10.39724	0.014554	1.551592	0.00103	0.004176	33.13095	0.009077
	Sep	665634	0.035104	0.064374	10.32891	0.014787	1.564117	0.001034	0.00413	32.6075	0.009369
	Oct	479441	0.031209	0.052732	10.44144	0.014577	1.559369	0.00104	0.004181	33.93136	0.009114
	Nov	196727	0.031969	0.070885	10.64789	0.014661	1.592841	0.001085	0.004211	37.46352	0.009254
	Dec	127348	0.033255	0.091534	10.85191	0.014776	1.628856	0.001132	0.004236	41.04174	0.009433

Pelly River

Location	At 09BC001 (Pelly River at Pelly Crossing)									
	Month	Flows (x1000 m ³)	Ag mg/L	Al mg/L	As mg/L	Ca mg/L	Cd mg/L	Cl mg/L	Co mg/L	Cu mg/L
	Jan	184810	2.85373E-06	0.001517	0.000603	35.02661	0.000509	0.321756	0.001005	0.004977
	Feb	135464	2.8614E-06	0.001482	0.000606	35.06389	0.000513	0.321696	0.001008	0.004977
	Mar	133384	2.94824E-06	0.001507	0.000609	35.08358	0.000515	0.321409	0.00101	0.004977
	Apr	169517	4.36241E-06	0.002393	0.000611	34.9531	0.000506	0.31713	0.001	0.004973
	May	2070403	3.10973E-06	0.00182	0.000591	34.86996	0.000493	0.321102	0.00099	0.004976
	Jun	3473280	1.90004E-06	0.001114	0.000586	34.93571	0.000496	0.324792	0.000994	0.004979
	Jul	1990051	2.31276E-06	0.001351	0.000588	34.9177	0.000495	0.323519	0.000993	0.004978
	Aug	1352592	2.38204E-06	0.001386	0.000589	34.91997	0.000496	0.323299	0.000993	0.004978
	Sep	1192320	3.64055E-06	0.002125	0.000594	34.8476	0.000492	0.319458	0.000989	0.004975
	Oct	875837	2.58474E-06	0.001494	0.000591	34.91901	0.000496	0.322665	0.000994	0.004977
	Nov	388800	2.66205E-06	0.001499	0.000595	34.95364	0.0005	0.322389	0.000997	0.004977
	Dec	265697	2.91381E-06	0.001602	0.000599	34.97658	0.000504	0.321617	0.001	0.004977
	Average		2.87763E-06	0.001608	0.000597		0.000501			0.004977

Pelly River

Location	At 09BC001 (Pelly River at Pelly Crossing)										
	Month	Flows (x1000 m³)	Fe mg/L	K mg/L	Mg mg/L	Mn mg/L	Na mg/L	Ni mg/L	Pb mg/L	SO4 mg/L	Zn mg/L
	Jan	184810	0.026751	0.053401	10.77175	0.014376	1.582621	0.001088	0.004275	38.78408	0.008901
	Feb	135464	0.026588	0.05977	10.87454	0.014385	1.596477	0.001108	0.004294	40.48189	0.008929
	Mar	133384	0.026656	0.064516	10.94081	0.014401	1.605867	0.001121	0.004305	41.51533	0.00896
	Apr	169517	0.029892	0.068065	10.76492	0.014559	1.597266	0.001098	0.004247	38.90311	0.009137
	May	2070403	0.027975	0.031889	10.37644	0.014373	1.532535	0.001013	0.004196	32.34376	0.008838
	Jun	3473280	0.02544	0.021135	10.4051	0.014228	1.522934	0.001008	0.004222	32.4371	0.008654
	Jul	1990051	0.026289	0.025598	10.40808	0.014279	1.527913	0.001012	0.004215	32.60929	0.00872
	Aug	1352592	0.026407	0.027257	10.42289	0.014289	1.530734	0.001015	0.004217	32.88648	0.008736
	Sep	1192320	0.029067	0.037821	10.38277	0.014439	1.539329	0.001019	0.004189	32.61302	0.008925
	Oct	875837	0.026787	0.030795	10.4457	0.014316	1.53612	0.001022	0.004218	33.33785	0.008774
Nov	388800	0.026766	0.037973	10.55055	0.014335	1.550928	0.001043	0.004236	35.07075	0.008814	
Dec	265697	0.027102	0.046092	10.64308	0.014372	1.565926	0.001063	0.00425	36.65653	0.008876	
Average					0.014363		0.001051	0.004239		0.008855	

APPENDIX B

SELECTION OF COPC

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APPENDIX B: SELECTION OF CONTAMINANTS OF POTENTIAL CONCERN

A selection process was performed to identify contaminants of potential concern at the Anvil Range Mine site. The following sections describe the process followed for the selection of contaminants of concern.

The 37 contaminants that were considered for this assessment include: aluminum (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), bismuth (Bi), boron (B), cadmium (Cd), calcium (Ca), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), lithium (Li), magnesium (Mg), manganese (Mn), mercury (Hg), molybdenum (Mo), nickel (Ni), phosphate (P), potassium (K), selenium (Se), silicon (Si), silver (Ag), sodium (Na), strontium (Sr), thallium (Tl), thorium (Th), tellurium (Te), tin (Sn), titanium (Ti), tungsten (W), uranium (U), vanadium (V), zirconium (Zr) and zinc (Zn).

B.1 SELECTION PROCESS

A selection process for contaminants in soil and water (see Figure B.1-1) was used to identify the COPC for the risk assessment. A slightly different screening procedure was used to select contaminants based on measured concentrations in sediment and vegetation samples; this is discussed in more detail in the Section B.2.

In general, the COPC selection process for surface water and soil involved four steps:

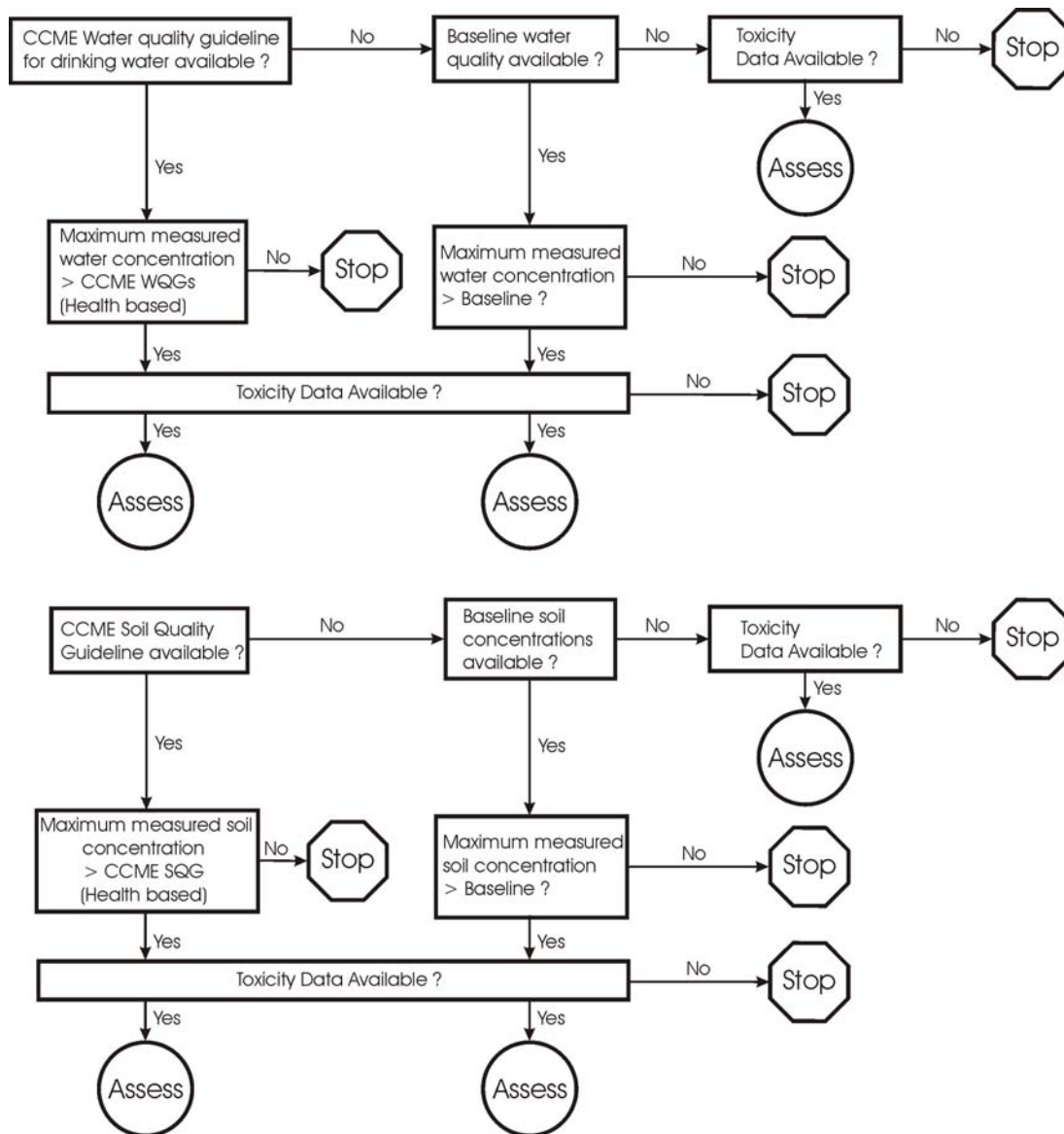
Step 1 – Contaminants with more than 90% of sampled concentrations from the affected area reported as below MDL were considered as heavily censored and were not be considered further. Measurements reported as below the laboratory method detection limit (MDL) were assumed to be at half of the MDL.

Step 2 – Concentrations in the affected areas were compared to concentrations obtained from reference sites. If the mean concentration from the affected area was higher than the reference mean, then the one-sided Wilcoxon rank-sum test was used to determine if the difference was statistically significant at a 0.10 level. The Wilcoxon rank-sum test is a non-parametric test for comparing two independent samples without any underlying assumptions of normality for the samples tested. Only contaminants with concentrations in the affected area that were significantly higher than reference concentrations were kept for further assessment.

Step 3 – The contaminants identified to have higher concentrations in the affected area than those at reference sites (i.e. from Step 2) were then compared to the appropriate screening criteria (e.g., the CCME guidelines for fresh water, soil and sediment). For contaminants with at

least 20 site measurements, the 95th percentile was compared to the screening criteria. For contaminants with less than 20 site measurements, the maximum was used instead. Contaminants with concentrations lower than the screening criteria were dropped from further assessment.

FIGURE B.1-1
SELECTION PROCEDURE FOR CONTAMINANTS OF POTENTIAL CONCERN



Note: Maximum is either the absolute maximum measured value, or the 95th percentile value where there were more than 10 samples.

Step 4 – The contaminants identified in Step 3 were then checked to see if corresponding toxicity data were available. Contaminants without appropriate toxicity data would not be further assessed.

The following sections discuss the selection results, using the above methodology, for the different environmental media including surface water (at Faro mine site and Vangorda mine site), soil, sediment, and vegetation.

B.1.1 Surface Water Quality Data

The total metals concentrations in surface water measured at the Faro mine site and Vangorda mine site between January 2002 and December 2004 were used in the assessment. The Faro mine site and Vangorda mine site were assessed separately.

Faro Mine Site

Samples measured on 13 April 2004 were excluded from the dataset considered in the analysis. These samples were analyzed by a different laboratory than the other samples and the method detection limit (MDL) for some of the contaminants was high: 0.01 mg/L for Ag, 0.03 mg/L for As, 0.01 mg/L for Cd, 0.02 mg/L for Co, 0.03 mg/L for Pb. Measurements from reference station W10 were also excluded from the dataset because of consistently high Zn concentrations, which suggest that this site was not reflective of a background or reference station and may in fact be potentially affected by mine activities. One sample collected on 17 June 2003 at reference station R7 was also excluded from the dataset because of high Zn and suspended solids (TSS) levels. Table B.1-1 provides a summary of the data set and selection process for the Faro Mine site.

As seen from Table B.1-1, several contaminants including Be, Hg, Se, Te, Th, Tl, V, W and Zr were dropped from the selection process because more than 90% of the measurements were below the MDL.

The second step involved a comparison of the affected areas to background or reference locations. Therefore, surface water quality data measured from Rose Creek were compared to the concentrations measured at the reference sites for the contaminants with concentrations above the MDL. Since samples were collected at different locations on different dates, only data with the same date that were measured at both affected and reference areas were used for this comparison. The reference concentrations were measured at stations that were not affected by mining activities. Many contaminants were dropped in this process and the following contaminants were found to have site concentrations that were statistically higher than reference concentrations: Ag, Ca, Cr, Fe, K, Mg, Mn, Na, Pb, Sr, and U. Although the difference between

the mean uranium concentrations at affected area and at reference sites was found to be statistically significant, the magnitude of the measurements was not significant (0.0014 mg/L at reference sites compared to 0.0015 mg/L at affected area) and thus uranium was dropped from further consideration. A similar argument holds for chromium and thus it was not considered further. Calcium, potassium, magnesium, and sodium were not considered further as they are integral components of environmental matrices. In addition, toxicity data are not available for these contaminants.

The next step involved the comparison of the measured concentrations of Ag, Fe, Mn, Pb and Sr to CCME guidelines (CCME 2002) for the protection of aquatic life. Toxicity data are not available for iron and strontium and thus they are dropped from further consideration.

Overall, the contaminants in Rose Creek that satisfied the conditions in all of the four selection steps were considered as COPC and were carried through in the risk assessment include Ag, Mn, and Pb.

Vangorda Mine Site

Approximately 123 samples were collected for most of the contaminant of interest as shown in Table B.1-2. As seen in the table, five contaminants had a significant number of sample concentrations below detection limits and hence they were not considered further. These include Bi, Hg, Se, Th, Tl, and W.

The second step involved a comparison of the affected areas to background or reference locations. Therefore, the remaining contaminant concentrations were compared to reference concentrations and results showed that only Ba, Ca, K, Mg, Mn, Na, Sr, and Zn had concentrations with statistically significant differences to the reference concentrations. Barium, calcium, potassium, magnesium, and sodium were not considered further as they are integral components of environmental matrices. Therefore, Manganese and zinc concentrations were then compared to CCME guidelines for the protection of aquatic life as well as being checked to see if there are corresponding toxicity data. Both of these contaminants had concentrations above CCME guidelines and have toxicity values.

In summary, the COPC considered from Vangorda Creek were Mn and Zn.

TABLE B.1-1
SELECTION OF CONTAMINANTS OF CONCERN IN SURFACE WATER IN ROSE CREEK

Analyte	Units	N	N<MDL	Reference Mean	Affected Area			CCME Guideline Aquatic (FW)	Heavily Censored?	> Ref?	> CCME Guideline Aquatic (FW)	With Tox Data?	COPC?	Remarks
					Mean	P95	Max							
Ag	mg/L	212	159	0.0001	0.0005	0.001	0.024	0.0001	N	Y	Y	Y	Y	
Al	mg/L	212	8	0.0659	0.0812	0.34	0.89	0.005-0.1	N	N	Y	Y		
As	mg/L	212	180	0.001	0.0014	0.005	0.022	0.005	N	N	N	Y		
B	mg/L	212	99	0.0392	0.0409	0.17	0.22	.	N	N	-	Y		
Ba	mg/L	212	0	0.0709	0.0795	0.198	0.326	.	N	N	-	Y		
Be	mg/L	212	194	0.0004	0.0004	0.0005	0.001	.	Y	N	-	Y		
Bi	mg/L	212	184	0.0035	0.0038	0.025	0.03		N	N	-			
Ca	mg/L	212	0	29.5947	38.8856	91.9	142		N	Y	-			
Cd	mg/L	212	175	0.0002	0.0002	0.0007	0.005	0.000017	N	N	Y	Y		
Co	mg/L	212	162	0.0006	0.0008	0.0025	0.014	.	N	N	-	Y		
Cr	mg/L	212	126	0.0011	0.0017	0.007	0.018	0.0089	N	Y	-	Y		Mean Conc no different than ref.
Cu	mg/L	212	64	0.0045	0.0057	0.034	0.107	0.002-0.004	N	N	Y	Y		
Fe	mg/L	212	0	0.2641	0.3727	0.8	3.74	0.3	N	Y	Y			
Hg	mg/L	8	8	0.01	0.01	0.01	0.01	0.000026	Y	N	Y	Y		
K	mg/L	212	0	0.9211	1.2117	2.6	4.2		N	Y	-			
La	mg/L	134	45	0.0037	0.0035	0.009	0.011		N	N	-			
Li	mg/L	8	0	0.0037	0.005	0.01	0.01		N	N	-			
Mg	mg/L	212	0	6.5358	8.3356	19.8	29.5		N	N	-			
Mn	mg/L	212	0	0.0283	0.248	1.629	2.37	.	N	Y	-	Y	Y	No CCME but tox data available
Mo	mg/L	212	107	0.0011	0.0009	0.004	0.009	0.073	N	N	N	Y		
Na	mg/L	212	0	2.2653	3.3556	9.75	15		N	Y	-			
Ni	mg/L	212	113	0.0011	0.002	0.007	0.041	0.025-0.15	N	N	N	Y		
P	mg/L	212	135	0.0829	0.086	0.2	0.5		N	N	-			
Pb	mg/L	212	120	0.0017	0.0029	0.012	0.047	0.001-0.007	N	Y	Y	Y	Y	
Sb	mg/L	212	156	0.0028	0.0028	0.015	0.042	.	N	N	-	Y		
Se	mg/L	212	212	0.001	0.0011	0.0025	0.003	0.001	Y	N	Y	Y		
Si	mg/L	154	0	9.8294	9.0546	15.8	20.6		N	N	-			
Sn	mg/L	212	135	0.0038	0.0022	0.02	0.322	.	N	N	-	Y		
Sr	mg/L	212	4	0.1127	0.1495	0.296	0.46	.	N	Y	-			
Te	mg/L	8	8	0.0005	0.0005	0.0005	0.001		Y	N	-			
Th	mg/L	78	77	0.0003	0.0003	0.0003	0.001		Y	N	-			
Ti	mg/L	8	6	0.0008	0.0006	0.001	0.001		N	N	-			
Tl	mg/L	8	8	0.0001	0.0001	0.0001	0	0.0008	Y	N	N			
U	mg/L	8	0	0.0014	0.0015	0.0017	0.002	.	N	Y	-	Y		Aff. conc no different than ref.
V	mg/L	212	200	0.0007	0.0007	0.0025	0.003	.	Y	N	-	Y		
W	mg/L	134	134	0.015	0.015	0.015	0.015		Y	N	-			
Zn	mg/L	212	11	0.0256	0.0249	0.07	0.11	0.03	N	N	Y	Y		
Zr	mg/L	8	8	0.005	0.005	0.005	0.005		Y	N	-			

TABLE B.1-2
SELECTION OF CONTAMINANTS OF CONCERN IN SURFACE WATER IN VANGORDA CREEK

Analyte	Units	N	N<MDL	Reference Mean	Affected Area			CCME Guideline Aquatic (FW)	Heavily Censored?	> Ref?	> CCME Guideline? Aquatic (FW)	With Tox Data?	COPC?	Remarks
					Mean	P95	Max							
Ag	mg/L	123	81	0.0005	0.0003	0.001	0.003	0.0001	N	N	Y	Y		
Al	mg/L	123	2	0.0829	0.1277	0.91	5.29	0.005-0.1	N	N	Y	Y		
As	mg/L	123	87	0.0037	0.0048	0.014	0.044	0.005	N	N	Y	Y		
B	mg/L	123	48	0.0827	0.0732	0.14	0.21	.	N	N	-	Y		
Ba	mg/L	123	0	0.0921	0.1102	0.218	0.331	.	N	Y	-			
Be	mg/L	123	103	0.0003	0.007	0.1	0.5	.	N	N	-	Y		
Bi	mg/L	123	114	0.011	0.0066	0.025	0.04		Y	N	-			
Ca	mg/L	123	0	35.0786	66.6695	113	142.9		N	Y	-			
Cd	mg/L	123	92	0.0003	0.0189	0.1	1.3	0.000017	N	N	Y	Y		
Co	mg/L	123	98	0.0011	0.0008	0.003	0.006	.	N	N	-	Y		
Cr	mg/L	123	53	0.0036	0.0028	0.01	0.015	0.0089	N	N	-	Y		
Cu	mg/L	123	10	0.0178	0.0148	0.04	0.104	0.002-0.004	N	N	Y	Y		
Fe	mg/L	123	4	0.1833	0.2511	1.46	8.93	0.3	N	N	Y			
Hg	mg/L	41	41	0	0	0	0	0.000026	Y	N	Y	Y		
K	mg/L	123	0	0.735	1.2407	2.1	3		N	Y	-			
La	mg/L	94	23	0.0024	0.0034	0.011	0.019		N	Y	-			
Li	mg/L	29	0	0.0027	0.0033	0.008	0.01		N	N	-			
Mg	mg/L	123	0	10.8132	26.2817	47.4	71.3		N	Y	-			
Mn	mg/L	123	0	0.0159	0.0274	0.09	0.34	.	N	Y	-	Y	Y	No CCME but tox data available
Mo	mg/L	123	34	0.0019	0.0019	0.005	0.013	0.073	N	N	N	Y		
Na	mg/L	123	0	2.2173	3.6714	7	9.6		N	Y	-			
Ni	mg/L	123	38	0.0039	0.003	0.01	0.022	0.025-0.15	N	N	N	Y		
P	mg/L	123	73	0.0239	0.0352	0.13	1.4		N	N	-			
Pb	mg/L	123	64	0.0037	0.0042	0.013	0.02	0.001-0.007	N	N	Y	Y		
Sb	mg/L	123	84	0.0059	0.0044	0.015	0.06	.	N	N	-	Y		
Se	mg/L	123	119	0.002	0.002	0.003	0.02	0.001	Y	N	Y	Y		
Si	mg/L	80	0	7.8357	6.9886	13.5	22.2		N	N	-			
Sn	mg/L	123	72	0.0051	0.0047	0.03	0.07	.	N	N	-	Y		
Sr	mg/L	123	0	0.1402	0.2477	0.442	0.558	.	N	Y	-			
Th	mg/L	29	28	0.0002	0.0003	0	0.002		Y	N	-			
Tl	mg/L	72	71	0.0007	0.0006	0.001	0.002	0.0008	Y	N	Y			
U	mg/L	29	0	0.003	0.0032	0.007	0.009	.	N	N	-	Y		
V	mg/L	123	107	0.0006	0.0007	0.003	0.013	.	N	N	-	Y		
W	mg/L	94	92	0.015	0.015	0.015	0.04		Y	N	-			
Zn	mg/L	123	9	0.0137	0.0278	0.073	0.175	0.03	N	Y	Y	Y	Y	

B.1.2 Soil Quality Data

The soil quality data was a smaller data set than the water samples and did not include uranium and some other contaminants (trace metals) that were considered in the surface water samples. Nonetheless, the dataset contained the contaminants which were important to the Faro Complex site and the screening was performed on this dataset which contained a total of 59 samples.

A review of the dataset in Table B.1-3 indicates that, soil samples with Ag, Be, Mo, and Sb have more than 90% of the measured data below detection limits. Thus, these contaminants were not considered further.

Of the remaining contaminants, 15 had measured concentrations that were statistically different from the reference concentrations. The reference concentrations were measured at locations that were considered to be away from the influences of the mine site. As a result, Al, As, Ba, Co, Cr, Cu, Fe, Hg, Ni, Pb, Sn, Ti, V, Zn, and Zr were carried through to the next selection step.

The screening criterion used for soil was the CCME soil quality guideline for agricultural land use (CCME 2003). Six of the 15 contaminants carried through exceeded the screening criteria. These include As, Cu, Pb, Sn, Ti and Zn. There were no guideline values for Al, Fe and Zr and therefore they were also still retained in the screening. Aluminum is an integral part of geological structures and thus it was not considered further. Finally, there are no appropriate toxicity values for Fe, Ti and Zr and therefore these contaminants were dropped from the assessment. Overall, As, Cu, Pb, Sn, and Zn were selected as COPCs from the soil screening process.

TABLE B.1-3
SELECTION OF CONTAMINANTS OF CONCERN IN SOILS FROM FARO MINE COMPLEX

Analyte	Units	N	N<MDL	Reference Mean	Affected Area			CCME Guideline Agricultural	Heavily Censored?	> Ref?	> CCME Guideline? Agricultural	With Tox Data?	COPC?	Remarks
					Mean	P95	Max							
Ag	mg/kg	59	54	1.05	1.19	3	6	20	Y	N	N	Y		
Al	mg/kg	59	0	785.5	3323.17	12300	24200	.	N	Y	-	Y		an intergral part of geological structure
As	mg/kg	59	0	0.73	8.65	32	64.8	12	N	Y	Y	Y	Y	
B	mg/kg	59	12	7.61	4.65	14	18	2	N	N	Y	Y		
Ba	mg/kg	59	0	206.08	330.41	748	961	750	N	Y	N	Y		
Be	mg/kg	59	59	0.5	0.5	0.5	0.5	4	Y	N	N	Y		
Ca	mg/kg	59	0	13685.53	11671.8	29600	36600	.	N	N	-			
Cd	mg/kg	59	9	1.76	1.81	5.2	12.4	1.4	N	N	Y	Y		
Co	mg/kg	59	9	1.39	3.4	11	21	40	N	Y	N	Y		
Cr	mg/kg	59	16	1.11	6.7	31	45	64	N	Y	N	Y		
Cu	mg/kg	59	0	10.63	39.64	113	272	63	N	Y	Y	Y	Y	
Fe	mg/kg	59	0	1074.97	7561.97	31900	37100	.	N	Y	-			
Hg	mg/kg	59	0	0.11	0.57	1.92	4.3	6.6	N	Y	N	Y		
K	mg/kg	59	0	1226.89	1139.63	1910	3610	.	N	N	-			
Mg	mg/kg	59	0	1582.5	1889.8	5630	10100	.	N	N	-			
Mn	mg/kg	59	0	628.26	487.11	1450	4360	.	N	N	-	Y		
Mo	mg/kg	59	56	2.58	2.17	5	6	5	Y	N	N	Y		
Na	mg/kg	59	9	31.84	51.07	194	324	.	N	N	-			
Ni	mg/kg	59	4	3.53	8.71	27	55	50	N	Y	N	Y		
P	mg/kg	59	0	930.32	917.29	1640	2360	.	N	N	-			
Pb	mg/kg	59	0	9.89	587.56	2410	5930	70	N	Y	Y	Y	Y	
Sb	mg/kg	59	59	5	5	5	5	20	Y	N	N	Y		
Se	mg/kg	59	9	0.57	0.54	1.2	2	1	N	N	N	Y		
Sn	mg/kg	59	49	2.5	3.14	7	8	5	N	Y	Y	Y	Y	
Sr	mg/kg	59	0	59.97	53.96	145.5	169	.	N	N	-	Y		
Ti	mg/kg	59	0	18.89	85.96	396	560	1	N	Y	Y			
V	mg/kg	59	2	1.97	7.47	30	40	130	N	Y	N	Y		
Zn	mg/kg	59	0	118	496.11	1380	3050	200	N	Y	Y	Y	Y	
Zr	mg/kg	59	34	0.53	1.18	3	7	.	N	Y	-			

B.2 SEDIMENT AND VEGETATION SCREENING

The screening process in the surface water and soil is the general methodology used to select COPC for risk assessments. Therefore, the screening for the sediment and vegetation samples was carried out only to identify contaminants that were possibly not selected in the general screening process. A slightly different methodology was used in this case. Samples were still compared to background; however only contaminants with sediment quality criteria or reported phytotoxic levels were considered further to select additional COPC. If no sediment quality guidelines or phytotoxic levels were available, then these contaminants were not considered further.

B.2.1 Sediment Quality Data

A total of 12 samples were obtained from the affected area for sediments as seen in Table B.2-1. From this dataset it can be seen that Be had more than 90% of the measured concentration below detection limits and was therefore not carried through to the next selection step.

A total of 19 contaminants of interest had their concentrations that were statistically different from the reference concentrations. The reference sediment concentrations were measured at locations upstream of the mine site where there would be no influences from mining activities. Of these contaminants, only As, Cd, Cr, Cu, Hg, Pb and Zn have CCME Sediment Quality Guidelines. These contaminants were then considered in the screening step. Tl does not have CCME Sediment Quality Guidelines; however, it was carried through the assessment because its concentration was statistically different from the reference concentrations and toxicity data were available.

The screening criteria used for sediment was the CCME ISQG (interim Sediment Quality Guideline) and the PEL (Probable Effects Limit). As seen from Table B.2-1, Cd, Cr, Cu and Hg were measured at concentrations above the ISQG but below the PEL and thus were dropped from further consideration.

Only As, Pb, Tl and Zn were identified from the sediment screening.

TABLE B.2-1
SELECTION OF CONTAMINANTS OF CONCERN IN SEDIMENTS FROM FARO MINE COMPLEX

Analyte	Units	N	N<MDL	Reference Mean	Affected Area			CCME Guideline		Heavily Censored?	> Ref?	> CCME Guideline?		With Tox Data?	COPC?	Remarks
					Mean	P95	Max	ISQG	PEL			ISQG	PEL			
Ag	ug/g	12	2	0.09	0.29	0.5	0.5	.	.	N	Y	-	-	Y		
Al	ug/g	12	0	10351.11	11000	15100	15100	.	.	N	N	-	-	Y		
As	ug/g	12	0	12.07	15.2	24.3	24.3	5.9	17	N	Y	Y	Y	Y	Y	
B	ug/g	12	8	0.5	0.75	2	2	.	.	N	Y	-	-	Y		
Ba	ug/g	12	0	159.78	315.75	586	586	.	.	N	Y	-	-	Y		
Be	ug/g	12	12	0.5	0.5	0.5	0.5	.	.	Y	N	-	-	Y		
Ca	ug/g	12	0	4521.11	6147.5	11000	11000	.	.	N	Y	-	-			
Cd	ug/g	12	0	0.63	0.92	1.7	1.7	0.6	3.5	N	Y	Y	N	Y		Below PEL
Co	ug/g	12	0	9.89	14.17	21	21	.	.	N	Y	-	-	Y		
Cr	ug/g	12	0	24.78	31.75	41	41	37.3	90	N	Y	Y	N	Y		Below PEL
Cu	ug/g	12	0	18.56	46.5	89	89	35.7	197	N	Y	Y	N	Y		Below PEL
Fe	ug/g	12	0	19577.78	23091.67	29500	29500	.	.	N	Y	-	-			
Hg	ug/g	12	1	0.04	0.11	0.22	0.22	0.17	0.486	N	Y	Y	N	Y		Below PEL
K	ug/g	12	0	1008.78	1052.83	1580	1580	.	.	N	N	-	-			
Mg	ug/g	12	0	4508.89	5342.5	7280	7280	.	.	N	Y	-	-			
Mn	ug/g	12	0	1096.11	2682.33	6410	6410	.	.	N	Y	-	-	Y		
Mo	ug/g	12	0	1.23	1.46	2.4	2.4	.	.	N	N	-	-	Y		
Na	ug/g	12	0	149	165.25	209	209	.	.	N	N	-	-			
Ni	ug/g	12	0	25.56	35.83	48	48	18	35.9	N	Y	Y	Y	Y	Y	
P	ug/g	12	0	2627.78	3099.17	9040	9040	.	.	N	N	-	-			
Pb	ug/g	12	0	50.31	148.91	264	264	35	91.3	N	Y	Y	Y	Y	Y	
Sb	ug/g	12	0	0.61	1.28	2	2	.	.	N	Y	-	-	Y		
Se	ug/g	12	0	0.59	0.74	1.5	1.5	.	.	N	N	-	-	Y		
Sn	ug/g	12	10	2.5	6.58	40	40	.	.	N	N	-	-	Y		
Sr	ug/g	12	0	30.78	33.67	50	50	.	.	N	N	-	-	Y		
Ti	ug/g	12	0	267.11	326.33	575	575	.	.	N	Y	-	-			
Tl	ug/g	12	0	0.15	0.3	0.5	0.5	.	.	N	Y	-	-	Y	Y	No CCME but tox data available
V	ug/g	12	0	30.56	29.75	38	38	.	.	N	N	-	-	Y		
Zn	ug/g	12	0	116	341.08	607	607	123	315	N	Y	Y	Y	Y	Y	
Zr	ug/g	12	1	1.67	1.54	3	3	.	.	N	N	-	-			

B.2.2 Vegetation Quality Data

A total of 116 samples were collected in the vegetation sampling program as shown in Table B.2-2. For screening purposes, only forb, grass, horsetail, labrador tea and willow samples were considered.

Contaminants that had concentrations below the detection limits for more than 90% of the measurements include Be, Sb, Te, U, V and Zr. These six contaminants were therefore not considered further.

Eight of the contaminants which included Ag, As, Cr, Fe, Hg, Ni, Pb, and Zn had concentrations that were statistically different to reference concentrations. The reference concentrations were measured at locations not influenced by mining activities.

Out of the eight contaminants carried through from the previous selection step, only Pb and Zn had 95th percentile concentrations exceeding the phytotoxic levels. Cd was also considered to be a COPC since its 95th percentile concentration was above its corresponding phytotoxic level even though it was not statistically different than the reference concentration. This is a conservative assumption.

Overall, Cd, Pb and Zn were identified from the vegetation screening.

TABLE B.2-2
SELECTION OF CONTAMINANTS OF CONCERN IN VEGETATION FROM FARO MINE COMPLEX

Analyte	Units	N	N<MDL	Reference Mean	Affected Area			Phytotoxic Level	Heavily Censored?	> Ref?	>Phytotoxic Level?	COPC?
					Mean	P95	Max					
Ag	ug/g dry	116	44	0.01	0.0325	0.12	0.34	.	N	Y	-	
Al	ug/g dry	42	0	12.99	14.952	39.8	49.6	50	N	N	N	
As	ug/g dry	116	96	0.24	0.5349	2	11	3	N	Y	N	
B	ug/g dry	42	0	15.85	16.262	31	37	.	N	N	-	
Ba	ug/g dry	42	0	51.7	63.545	122	269	400	N	N	N	
Be	ug/g dry	42	38	0.01	0.016	0.06	0.13	.	Y	N	-	
Ca	ug/g dry	42	0	13393.08	15081	32100	39800	.	N	N	-	
Cd	ug/g dry	116	12	2.11	1.7283	9.92	17.27	5	N	N	Y	Y
Co	ug/g dry	42	17	0.18	0.4679	1.4	5.4	3	N	N	N	
Cr	ug/g dry	116	9	0.21	0.5272	1.1	20.2	5	N	Y	N	
Cu	ug/g dry	116	0	4.39	4.7979	8.3	11.7	.	N	N	-	
Fe	ug/g dry	42	0	63.54	77.786	144	156	.	N	Y	-	
Hg	ug/g dry	116	60	0.01	0.0132	0.04	0.07	1	N	Y	N	
K	ug/g dry	42	0	22685.38	21008	47100	47900	.	N	N	-	
Mg	ug/g dry	42	0	4987.69	3827.6	8770	10300	.	N	N	-	
Mn	ug/g dry	42	0	310.18	363.85	1510	1820	.	N	N	-	
Mo	ug/g dry	42	6	5.45	0.7357	2.2	3.7	10	N	N	N	
Na	ug/g dry	42	5	20.35	22.655	52	312	.	N	N	-	
Ni	ug/g dry	116	1	0.87	2.5392	8.6	21.6	.	N	Y	-	
P	ug/g dry	42	0	6940	5244	8150	9230	.	N	N	-	
Pb	ug/g dry	116	4	0.16	7.0164	43.8	115	20	N	Y	Y	Y
Sb	ug/g dry	42	42	0.05	0.05	0.05	0.05	150	Y	N	N	
Se	ug/g dry	116	99	1.33	0.4526	1	3	5	N	N	N	
Si	ug/g dry	42	0	827.15	917.48	1820	1900	.	N	N	-	
Sn	ug/g dry	42	22	0.23	0.1167	0.3	0.4	.	N	N	-	
Sr	ug/g dry	42	0	44	64.376	148	176	.	N	N	-	
Te	ug/g dry	42	42	0.05	0.05	0.05	0.05	.	Y	N	-	
Ti	ug/g dry	42	0	1.84	1.069	1.9	2	.	N	N	-	
Tl	ug/g dry	42	36	0.01	0.0202	0.08	0.18	11	N	Y	N	
U	ug/g dry	42	42	0.02	0.02	0.02	0.02	.	Y	N	-	
V	ug/g dry	42	42	0.25	0.25	0.25	0.25	5	Y	N	N	
Zn	ug/g dry	116	0	116.14	186.83	663	2350	100	N	Y	Y	Y
Zr	ug/g dry	42	42	1.5	1.5	1.5	1.5	.	Y	N	-	

B.3 OVERALL LIST OF COPC CONSIDERED

A summary table with the selected COPC for the various environmental media is provided in Table B.3-1. From the large list of contaminants identified in Table B.3-1, it can be seen that only 10 have become COPC. They are Ag, As, Cd, Cu, Pb, Mn, Ni, Sn, Tl and Zn.

Of these COPC, the surface water screening identified Ag, Mn, Pb and Zn. The soil screening identified As, Cu, and Sn in addition to Pb and Zn. The sediment screening identified Ni as well as As, Pb, Tl and Zn. Finally, the vegetation screening identified Cd in addition to contaminants already identified in the water, soil and sediment screenings.

TABLE B.3-1
SUMMARY OF CONTAMINANTS OF CONCERN FROM FARO MINE COMPLEX

Analyte	COPC?					Rose Creek List of COPC	Vangorda List of COPC
	Water-Rose	Water-Vangorda	Soil	Sediment	Vegetation		
Ag	Y					Ag	
Al							
As			Y	Y		As	As
B							
Ba							
Be							
Bi							
Ca							
Cd					Y	Cd	Cd
Co							
Cr							
Cu			Y			Cu	Cu
Fe							
Hg							
K							
La							
Li							
Mg							
Mn	Y	Y				Mn	Mn
Mo							
Na							
Ni				Y		Ni	Ni
P							
Pb	Y		Y	Y	Y	Pb	Pb
S							
Sb							
Se							
Si							
Sn			Y			Sn	Sn
Sr							
Te							
Th							
Ti							
Tl				Y		Tl	Tl
U							
V							
W							
Zn		Y	Y	Y	Y	Zn	Zn
Zr							

APPENDIX C

SUMMARY OF DATA

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APPENDIX C: SUMMARY OF DATA

This appendix summarizes the available monitoring data for the study area.

C.1 Aquatic Environment

This section discusses surface water and sediment quality within the Rose Creek and Vangorda Creek watersheds. Flesh samples from slimy sculpin and Arctic grayling from a field investigation (White Mountain Environmental Consulting 2004) conducted in the summer of 2004 are also summarized.

C.1.1 SURFACE WATER QUALITY

Measured water quality data collected over the 2002 to 2004 period within the Rose Creek and Vangorda Creek watersheds were provided by Gartner Lee Limited (2005a). Additional water samples from a biological and sediment monitoring program conducted by Laberge Environmental Services (2004) were also included in the assessment. Data for the Pelly River from the Environment Canada website (1992-1996) and the Selkirk First Nations report are summarized below.

After a preliminary review of the data, it was determined that there were some limitations in the 2002 to 2004 water quality database on Rose Creek and Vangorda Creek watersheds as several of the measurements were reported as less than method detection limits and some measurements were reported with high method detection limits. For the purpose of calculating summary statistics for these data, some of the samples with measurements for arsenic, copper and silver had to be excluded due to the high method detection limits; for other detection limit issues, concentrations measured as less than the detection limit (“<”) were considered as equal to ½ the detection limit.

Rose Creek Watershed

Surface water quality data were collected at different locations in the Rose Creek watershed. Table C.1.1-1 provides a list of monitoring stations in Rose Creek. Stations upstream of the mine are considered to be representative of background water quality conditions since pre-mining conditions in Rose Creek are not available.

TABLE C.1.1-1
MONITORING STATIONS IN ROSE CREEK

Upstream/Background Stations	
R1	Upstream of the confluence of the North and South Forks of Rose Creek
R6	Anvil Creek upstream of Rose Creek
R7	North Fork of Rose Creek upstream of Faro Creek diversion
W10	Upper Guardhouse Creek upstream of the Northwest rock dumps
Downstream	
NF1	North Fork of Rose Creek upstream of haul road
NF2	North Fork of Rose Creek downstream of haul road
R2	In the mixing zone downstream of the intersection of the Rose Creek diversion canal and the outlet of the tailings pond
R3	Rose Creek approximately half way between the tailings pond outlet and Anvil Creek
R4	Rose Creek just upstream of Anvil Creek
R5	Anvil Creek approximately 150 metres downstream of Rose Creek
R8	North Fork of Rose Creek, 100 m downstream of confluence with Faro Creek diversion
R9	North Fork of Rose Creek, adjacent to BH-1 & BH-2
R10	North Fork of Rose Creek, at least 100 m upstream from maximum elevation of water impounded behind North Fork rock drain and 100 m downstream of R9
X2	North Fork of Rose Creek upstream of mine access road
X3	North Fork of Rose Creek at the pump house reservoir
X10	Rose Creek Diversion Channel, below weirs
X14	Rose Creek, downstream of diversion channel

Sources: Gartner Lee Limited (2002) and Laberge (2004)

The measured data are summarized for total metal concentrations in Rose Creek watershed and the results are presented in Table C.1.1-2 (upstream of Faro Mine site) and Table C.1.1-3 (downstream of Faro Mine site). For comparison purposes, the Canadian Council of Ministers of the Environment (CCME 2003) water quality guidelines for the protection of aquatic life in fresh water have also been included in both tables.

Tables C.1.1-2 and C.1.1-3 also summarize the varying method detection limit (MDL) for each metal.

- The differences between the lowest and the highest laboratory MDL can be up to a factor of 50: the MDL for bismuth ranged from 0.001 mg/L to 0.05 mg/L. The MDL for some of the metals are high and some of them (e.g. aluminum, cadmium, lead, selenium and silver) are even higher than the CCME guideline values.

- Concentrations of beryllium, bismuth, chromium, cobalt, mercury, selenium, silver, thallium, thorium and tungsten are found to be mostly (over 90%) below the MDL at the stations upstream of the mine site.
- Mean concentrations of aluminum, cadmium, copper and lead exceed the CCME guidelines. Mean silver and selenium concentrations also exceed the CCME guideline value, however, since all the measurements are below the MDL and most of the MDLs are higher than the CCME guideline, the comparisons are not meaningful.
- Mean metal concentrations at the downstream stations are generally higher than the upstream concentrations with the exception of beryllium, lanthanum, phosphorus and silicon. In addition to the four metals that exceed the CCME guidelines at the upstream stations, mean iron concentration is also higher than the CCME guideline.
- Concentrations of beryllium, mercury, selenium, thallium, thorium, tungsten and vanadium are found to be mostly (over 90%) below the MDL at the stations downstream of the mine site.
- For both upstream and downstream stations, almost all samples exceed the CCME guidelines for aluminum and cadmium. This may be a MDL issue for cadmium because over 80% of the measured cadmium concentrations are below the MDL and the MDL for cadmium is higher than the CCME guideline.

TABLE C.1.1-2
WATER QUALITY SUMMARY – ROSE CREEK UPSTREAM OF FARO MINE SITE

Total Metals	Units	No. of obs.	No. of obs. <MDL	MDL	CCME Guidelines	No. of obs. >CCME	Minimum	Mean	Maximum
Aluminum	mg/L	19	0		0.005-0.1	19	0.007	0.066	0.6
Antimony	mg/L	19	17	0.001-0.03			0.0005	0.0028	0.023
Arsenic	mg/L	19	17	0.001-0.005	0.005	0	0.0005	0.001	0.003
Barium	mg/L	19	0				0.033	0.071	0.191
Beryllium	mg/L	19	18	0.0002-0.001			0.0001	0.00042	0.0005
Bismuth	mg/L	19	18	0.001-0.05			0.0005	0.0035	0.025
Boron	mg/L	19	15	0.05			0.025	0.039	0.11
Cadmium	mg/L	19	15	0.0002-0.001	0.000017	19	0.0001	0.00019	0.0011
Calcium	mg/L	19	0				10.7	29.6	50.2
Chromium	mg/L	19	18	0.001-0.005	0.0089	1	0.0005	0.0011	0.009
Cobalt	mg/L	19	18	0.001-0.005			0.0005	0.00063	0.0025
Copper	mg/L	14	12	0.001	0.002-0.004	1	0.0005	0.00086	0.005
Iron	mg/L	19	0		0.3	4	0.016	0.26	1.71
Lanthanum	mg/L	5	1	0.001			0.0005	0.0037	0.01
Lead	mg/L	19	16	0.001-0.01	0.001-0.007	3	0.0005	0.0017	0.015
Lithium	mg/L	6	0				0.002	0.0037	0.005
Magnesium	mg/L	19	0				2.2	6.5	11.3
Manganese	mg/L	19	0				0.006	0.028	0.19
Mercury	mg/L	6	6	0.00002	0.000026	0	0.00001	0.00001	0.00001
Molybdenum	mg/L	19	8	0.0005-0.001	0.073	0	0.00025	0.0011	0.007
Nickel	mg/L	19	13	0.001-0.005	0.025-0.15	0	0.0005	0.0011	0.004
Phosphorus	mg/L	19	15	0.01-0.15			0.005	0.083	0.4
Potassium	mg/L	19	0				0.4	0.92	2.1
Selenium	mg/L	19	19	0.001-0.005	0.001	5	0.0005	0.001	0.0025
Silicon	mg/L	17	0				4.4	9.8	18.5
Silver	mg/L	19	19	0.0002-0.001	0.0001	15	0.0001	0.00014	0.0005
Sodium	mg/L	19	0				0.9	2.27	5
Strontium	mg/L	19	0				0.047	0.11	0.222
Sulphur	mg/L	5	0				2.3	3.16	5.3
Thallium	mg/L	6	6	0.0001	0.0008	0	0.00005	0.00005	0.00005
Thorium	mg/L	14	14	0.0005			0.00025	0.00025	0.00025
Tin	mg/L	19	15	0.001-0.002			0.0005	0.0038	0.038
Tungsten	mg/L	5	5	0.03			0.015	0.015	0.015
Uranium	mg/L	6	0				0.0011	0.0014	0.0017
Vanadium	mg/L	19	17	0.001-0.005			0.0005	0.00066	0.0025
Zinc	mg/L	19	9	0.001-0.01	0.03	2	0.0005	0.026	0.18

Notes: CCME Guidelines = Canadian Council of Ministers of the Environment guidelines for protection of aquatic life (CCME 2003);
Shading indicates values that exceed CCME guidelines.
No. of obs. > CCME = number of observations greater than the CCME guideline. If the guideline is given as a range, the observations are compared to the lowest value.
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum values.

TABLE C.1.1-3
WATER QUALITY SUMMARY – ROSE CREEK DOWNSTREAM OF FARO MINE SITE

Total Metals	Units	No. of obs.	No. of obs. <MDL	MDL	CCME Guidelines	No. of obs. >CCME	Minimum	Mean	Maximum
Aluminum	mg/L	212	8	0.005-0.05	0.005-0.1	211	0.0025	0.087	0.89
Antimony	mg/L	212	156	0.001-0.03			0.0005	0.0045	0.042
Arsenic	mg/L	212	180	0.001-0.005	0.005	10	0.0005	0.0018	0.022
Barium	mg/L	212	0				0.013	0.098	0.326
Beryllium	mg/L	212	194	0.0002-0.001			0.0001	0.00031	0.0005
Bismuth	mg/L	212	184	0.001-0.05			0.0005	0.0071	0.03
Boron	mg/L	212	99	0.05			0.025	0.065	0.22
Cadmium	mg/L	212	175	0.0002-0.001	0.000017	212	0.0001	0.00026	0.0053
Calcium	mg/L	212	0				10.7	42.2	142
Chromium	mg/L	212	126	0.001-0.005	0.0089	5	0.0005	0.002	0.018
Cobalt	mg/L	212	162	0.001-0.005			0.0005	0.0011	0.014
Copper	mg/L	74	55	0.001	0.002-0.004	8	0.0005	0.00097	0.006
Iron	mg/L	212	0		0.3	76	0.015	0.33	3.74
Lanthanum	mg/L	134	45	0.001-0.005			0.0005	0.0033	0.011
Lead	mg/L	212	120	0.001-0.01	0.001-0.007	108	0.0005	0.0038	0.047
Lithium	mg/L	8	0				0.002	0.005	0.01
Magnesium	mg/L	212	0				2.24	8.8	29.5
Manganese	mg/L	212	0				0.011	0.26	2.37
Mercury	mg/L	8	8	0.00002	0.000026	0	0.00001	0.00001	0.00001
Molybdenum	mg/L	212	107	0.0005-0.002	0.073	0	0.00025	0.0013	0.009
Nickel	mg/L	212	113	0.001-0.005	0.025-0.15	1	0.0005	0.0023	0.041
Phosphorus	mg/L	212	135	0.01-0.15			0.005	0.053	0.5
Potassium	mg/L	212	0				0.4	1.3	4.2
Selenium	mg/L	212	212	0.001-0.005	0.001	134	0.0005	0.0018	0.0025
Silicon	mg/L	154	0				3.4	7.9	20.6
Silver	mg/L	212	159	0.0002-0.001	0.0001	152	0.0001	0.00041	0.0237
Sodium	mg/L	212	0				0.7	3.56	15
Strontium	mg/L	212	4	0.001-0.002			0.001	0.15	0.46
Sulphur	mg/L	134	0				2.1	12.1	70.8
Thallium	mg/L	8	8	0.0001	0.0008	0	0.00005	0.00005	0.00005
Thorium	mg/L	78	77	0.0005			0.00025	0.00025	0.0006
Tin	mg/L	212	135	0.001-0.01			0.0005	0.0062	0.322
Tungsten	mg/L	134	134	0.03			0.015	0.015	0.015
Uranium	mg/L	8	0				0.0014	0.0015	0.0017
Vanadium	mg/L	212	200	0.001-0.005			0.0005	0.00078	0.003
Zinc	mg/L	212	11	0.005-0.01	0.03	73	0.002	0.027	0.11

Notes: CCME Guidelines = Canadian Council of Ministers of the Environment guidelines for protection of aquatic life (CCME 2003);
Shading indicates values that exceed CCME guidelines.
No. of obs. > CCME = number of observations greater than the CCME guideline. If the guideline is given as a range, the observations are compared to the lowest value.
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum values.

Vangorda Creek Watershed

There are three upstream sampling stations and four downstream sampling stations in Vangorda Creek to monitor the surface water quality. These monitoring locations are described in Table C.1.1-4.

**TABLE C.1.1-4
MONITORING STATIONS IN VANGORDA CREEK**

Upstream/Background Stations	
V1	Vangorda Creek upstream of mine activities
V4	Shrimp Creek
V20	Vangorda Northeast diversion ditch
Downstream	
V5	West Fork Vangorda Creek
V8	Lower Vangorda Creek
V27	Main Stem Vangorda Creek (Upper)
VGMAIN	Main Stem Vangorda Creek (Lower)

Source: Gartner Lee Limited (2002)

Summary statistics of the data collected from the upstream and downstream stations are presented in Tables C.1.1-5 and Table C.1.1-6, respectively. CCME environmental quality guidelines for the protection of aquatic life are also included in the tables for comparison purposes. Some general observations respecting the metal levels measured at the upstream and downstream locations are noted as follows:

- At stations upstream of the Vangorda Plateau mine site, mean concentrations of aluminum, cadmium, copper, lead, selenium and silver exceed the CCME guidelines. In addition to the list, mean iron concentrations also exceed the guideline value at downstream stations.
- The list of exceedances is very similar to the list observed in Rose Creek. As in Rose Creek, all samples exceed the CCME guidelines for aluminum and cadmium at both upstream and downstream stations. This may again be a MDL issue for cadmium because the MDLs of cadmium are all higher than the CCME guideline value.
- Over 90% of the samples collected at both upstream and downstream stations in Vangorda Creek were found to have concentrations below MDL for mercury, selenium, thallium, thorium and tungsten.

- Mean concentrations at upstream stations are found to be slightly higher than the downstream stations for antimony, bismuth, boron, chromium, cobalt, copper, nickel, silicon, silver and thallium.

Mean concentrations of aluminum, calcium, iron, magnesium, manganese, phosphorus and sulphur at downstream stations are found to be at least twice as high as the upstream stations.

TABLE C.1.1-5
WATER QUALITY SUMMARY – VANGORDA CREEK UPSTREAM OF VANGORDA
PLATEAU MINE SITE

Total Metals	Units	No. of obs.	No. of obs. <MDL	MDL	CCME Guidelines	No. of obs. >CCME	Minimum	Mean	Maximum
Aluminum	mg/L	22	0		0.005-0.1	22	0.013	0.083	0.381
Antimony	mg/L	22	12	0.0002-0.03			0.0001	0.0059	0.029
Arsenic	mg/L	22	17	0.001-0.005	0.005	3	0.0002	0.0037	0.027
Barium	mg/L	22	0				0.016	0.092	0.208
Beryllium	mg/L	22	20	0.0002-0.002			0.0001	0.00026	0.001
Bismuth	mg/L	22	13	0.0002-0.05			0.0001	0.011	0.03
Boron	mg/L	22	6	0.01-0.05			0.005	0.083	0.23
Cadmium	mg/L	22	17	0.00004-0.002	0.000017	22	0.00002	0.00027	0.0013
Calcium	mg/L	22	0				6.8	35.1	101
Chromium	mg/L	22	8	0.001-0.005	0.0089	1	0.0003	0.0036	0.028
Cobalt	mg/L	22	16	0.0002-0.005			0.0001	0.0011	0.005
Copper	mg/L	5	2	0.001	0.002-0.004	1	0.0005	0.00132	0.003
Iron	mg/L	22	2	0.01-0.05	0.3	4	0.005	0.18	0.837
Lanthanum	mg/L	17	7	0.001			0.0005	0.0024	0.009
Lead	mg/L	22	9	0.0002-0.01	0.001-0.007	13	0.0001	0.0037	0.008
Lithium	mg/L	5	1	0.001			0.0005	0.0027	0.005
Magnesium	mg/L	22	0				0.9	10.8	39.5
Manganese	mg/L	22	2	0.001-0.01			0.0005	0.016	0.04
Mercury	mg/L	7	7	0.00002-0.0001	0.000026	2	0.00001	0.00002	0.00005
Molybdenum	mg/L	22	10	0.0001-0.001	0.073	0	0.00005	0.0019	0.007
Nickel	mg/L	22	9	0.001-0.005	0.025-0.15	0	0.0003	0.0039	0.021
Phosphorus	mg/L	22	13	0.01-0.15			0.005	0.024	0.075
Potassium	mg/L	22	0				0.3	0.74	1.4
Selenium	mg/L	22	22	0.0002-0.005	0.001	17	0.0001	0.002	0.0025
Silicon	mg/L	14	0				3.8	7.8	14
Silver	mg/L	22	17	0.00005-0.002	0.0001	11	0.00003	0.00052	0.0037
Sodium	mg/L	22	0				0.4	2.22	4.03
Strontium	mg/L	22	0				0.024	0.14	0.43
Sulphur	mg/L	17	0				1.2	6.2	18.4
Thallium	mg/L	13	12	0.00002-0.002	0.0008	8	0.00001	0.00071	0.002
Thorium	mg/L	5	5	0.0001-0.0005			0.00005	0.00021	0.00025
Tin	mg/L	22	13	0.0002-0.002			0.0001	0.0051	0.035
Tungsten	mg/L	17	17	0.03			0.015	0.015	0.015
Uranium	mg/L	5	1	0.0005			0.00025	0.003	0.0083
Vanadium	mg/L	22	20	0.0002-0.005			0.0001	0.00062	0.0025
Zinc	mg/L	22	5	0.001-0.01	0.03	3	0.0005	0.014	0.054

Notes: CCME Guidelines = Canadian Council of Ministers of the Environment guidelines for protection of aquatic life (CCME 2003);
Shading indicates values that exceed CCME guidelines.
No. of obs. > CCME = number of observations greater than the CCME guideline. If the guideline is given as a range, the observations are compared to the lowest value.
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum values.

TABLE C.1.1-6
WATER QUALITY SUMMARY – VANGORDA CREEK DOWNSTREAM OF
VANGORDA PLATEAU MINE SITE

Total Metals	Units	No. of obs.	No. of obs. <MDL	MDL	CCME Guidelines	No. of obs. >CCME	Minimum	Mean	Maximum
Aluminum	mg/L	123	2	0.05	0.005-0.1	123	0.007	0.23	5.29
Antimony	mg/L	123	84	0.001-0.03			0.0005	0.0047	0.06
Arsenic	mg/L	123	87	0.001-0.005	0.005	20	0.0005	0.0037	0.044
Barium	mg/L	123	0				0.023	0.12	0.331
Beryllium	mg/L	123	103	0.0002-0.002			0.0001	0.00028	0.001
Bismuth	mg/L	123	114	0.001-0.05			0.0005	0.0073	0.04
Boron	mg/L	123	48	0.05			0.025	0.068	0.21
Cadmium	mg/L	123	92	0.0002-0.001	0.000017	123	0.0001	0.00029	0.0029
Calcium	mg/L	123	0				16.7	71.9	142.9
Chromium	mg/L	123	53	0.001-0.005	0.0089	8	0.0005	0.0031	0.015
Cobalt	mg/L	123	98	0.001-0.005			0.0005	0.001	0.006
Copper	mg/L	26	4	0.001	0.002-0.004	5	0.0005	0.0024	0.018
Iron	mg/L	123	4	0.01-0.05	0.3	32	0.005	0.42	8.93
Lanthanum	mg/L	94	23	0.001-0.005			0.0005	0.0041	0.019
Lead	mg/L	123	64	0.001-0.01	0.001-0.007	70	0.0005	0.0041	0.02
Lithium	mg/L	29	0				0.001	0.0042	0.01
Magnesium	mg/L	123	0				4.2	27.4	71.3
Manganese	mg/L	123	0				0.003	0.033	0.34
Mercury	mg/L	41	41	0.00002-0.0001	0.000026	12	0.00001	0.00002	0.00005
Molybdenum	mg/L	123	34	0.0005-0.002	0.073	0	0.00025	0.002	0.013
Nickel	mg/L	123	38	0.001-0.005	0.025-0.15	0	0.0005	0.0031	0.022
Phosphorus	mg/L	123	73	0.01-0.15			0.005	0.053	1.4
Potassium	mg/L	123	0				0.5	1.38	3
Selenium	mg/L	123	119	0.001-0.005	0.001	95	0.0005	0.0023	0.02
Silicon	mg/L	80	0				3.7	7.4	22.2
Silver	mg/L	123	81	0.0002-0.001	0.0001	85	0.0001	0.00035	0.003
Sodium	mg/L	123	0				0.8	3.9	9.6
Strontium	mg/L	123	0				0.047	0.27	0.558
Sulphur	mg/L	94	0				8.1	36.4	89.8
Thallium	mg/L	72	71	0.0001-0.002	0.0008	43	0.00005	0.00063	0.002
Thorium	mg/L	29	28	0.0005			0.00025	0.0003	0.0016
Tin	mg/L	123	72	0.001-0.01			0.0005	0.0053	0.07
Tungsten	mg/L	94	92	0.03			0.015	0.015	0.04
Uranium	mg/L	29	0				0.0012	0.0039	0.0085
Vanadium	mg/L	123	107	0.001-0.005			0.0005	0.001	0.013
Zinc	mg/L	123	9	0.001-0.01	0.03	38	0.0005	0.027	0.175

Notes: CCME Guidelines = Canadian Council of Ministers of the Environment guidelines for protection of aquatic life (CCME 2003);
Shading indicates values that exceed CCME guidelines.
No. of obs. > CCME = number of observations greater than the CCME guideline. If the guideline is given as a range, the observations are compared to the lowest value.
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum values.

C.1.2 SEDIMENT QUALITY

Sediment samples were collected in July 2004 from seven sites (R1 to R7) located on Rose and Anvil Creeks as part of a biological and sediment monitoring program (Laberge 2004). Table C.1.2-1 provides a brief description for the sampling stations. Stations R1, R6 and R7 are located upstream of site facilities and are considered as reference sites. Three replicate stream sediment samples were collected and analyzed from each site.

No sediment samples were collected from the Vangorda Creek watershed during the 2004 monitoring program.

**TABLE C.1.2-1
SEDIMENT SAMPLING STATIONS**

Site ID	Site Description
R1	Upstream of the confluence of the North and South Forks of Rose Creek
R2	In the mixing zone downstream of the intersection of the Rose Creek diversion canal and the outlet of the tailings pond
R3	Rose Creek approximately half way between the tailings pond outlet and Anvil Creek
R4	Rose Creek just upstream of Anvil Creek
R5	Anvil Creek approximately 150 m downstream of Rose Creek
R6	Anvil Creek immediately upstream of Rose Creek
R7	North Fork of Rose Creek upstream of the confluence with the Faro Creek diversion

Summary statistics for the upstream (reference) sites and downstream sites are provided in Table C.1.2-2. The CCME Interim Sediment Quality Guidelines (ISQG) and Probable Effect Levels (PEL) are also provided in Table C.1.2-2. The guidelines provide scientific benchmarks for evaluating the potential for observing adverse biological effects on benthic invertebrates in aquatic systems. The ISQG values represent the concentrations below which adverse biological effects are expected to occur rarely. The PEL values represent the concentrations above which adverse effects are expected to occur frequently.

Bold shaded cells in Table C.1.2-2 indicate values that exceed ISQG. CCME ISQG levels were exceeded for arsenic, cadmium, chromium, copper, lead, mercury and zinc at the downstream sites. With the exception of copper, ISQG levels were also exceeded for these metals at the reference sites. PEL levels were exceeded for arsenic, lead and zinc for both downstream and reference sites.

TABLE C.1.2-2
SEDIMENT QUALITY AT ROSE AND ANVIL CREEKS

		CCME		Downstream Sites (N=12)					Reference Sites (N=9)				
Metals	Units	ISQG	PEL	N<MDL	Min.	Average	Max	Std. Dev	N<MDL	Min.	Average	Max	Std. Dev
Aluminum	mg/kg (dw)			0	8070	11000	15100	1998	0	6630	10351	13400	1876
Antimony	mg/kg (dw)			0	0.80	1.28	2.00	0.35	3	0.05	0.61	1.20	0.46
Arsenic	mg/kg (dw)	5.9	17	0	8.0	15.2	24.3	4.3	0	8.9	12.1	18.0	3.2
Barium	mg/kg (dw)			0	120	316	586	150	0	107	160	252	40
Beryllium	mg/kg (dw)			12	0.5	0.5	0.5	0.0	9	0.5	0.5	0.5	0.0
Boron	mg/kg (dw)			8	0.50	0.75	2.00	0.45	9	0.50	0.50	0.50	0.00
Cadmium	mg/kg (dw)	0.6	3.5	0	0.50	0.92	1.70	0.40	0	0.40	0.63	1.20	0.25
Calcium	mg/kg (dw)			0	4120	6148	11000	2116	0	2940	4521	7270	1302
Chromium	mg/kg (dw)	37.3	90	0	21.0	31.8	41.0	6.3	0	15.0	24.8	39.0	7.7
Cobalt	mg/kg (dw)			0	9.0	14.2	21.0	4.3	0	6.0	9.9	17.0	3.1
Copper	mg/kg (dw)	35.7	197	0	17.0	46.5	89.0	22.5	0	11.0	18.6	27.0	5.6
Iron	mg/kg (dw)			0	17900	23092	29500	3671	0	13400	19578	26800	4165
Lead	mg/kg (dw)	35	91.3	0	24.7	148.9	264.0	66.5	0	7.9	50.3	249.0	77.8
Magnesium	mg/kg (dw)			0	3860	5343	7280	988	0	3090	4509	5670	962
Manganese	mg/kg (dw)			0	923	2682	6410	1675	0	608	1096	2520	571
Mercury	mg/kg (dw)	0.17	0.486	1	0.005	0.110	0.220	0.067	3	0.005	0.038	0.180	0.056
Molybdenum	mg/kg (dw)			0	0.80	1.46	2.40	0.49	0	0.60	1.23	1.90	0.47
Nickel	mg/kg (dw)			0	23.0	35.8	48.0	8.1	0	17.0	25.6	35.0	6.7
Phosphorus	mg/kg (dw)			0	1700	3099	9040	1966	0	1580	2628	3380	616
Potassium	mg/kg (dw)			0	579	1053	1580	279	0	676	1009	1280	191
Selenium	mg/kg (dw)			0	0.50	0.74	1.50	0.31	0	0.40	0.59	0.90	0.15
Silver	mg/kg (dw)			2	0.05	0.29	0.50	0.14	5	0.05	0.09	0.30	0.08
Sodium	mg/kg (dw)			0	121	165	209	29	0	96	149	218	49
Strontium	mg/kg (dw)			0	20.0	33.7	50.0	8.0	0	18.0	30.8	43.0	8.8
Thallium	mg/kg (dw)			0	0.10	0.30	0.50	0.11	1	0.05	0.15	0.30	0.08
Tin	mg/kg (dw)			10	2.5	6.6	40.0	11.0	9	2.5	2.5	2.5	0.0
Titanium	mg/kg (dw)			0	224	326	575	94	0	135	267	403	80
Vanadium	mg/kg (dw)			0	24.0	29.8	38.0	4.7	0	20.0	30.6	41.0	8.2
Zinc	mg/kg (dw)	123	315	0	83.0	341.1	607.0	147.1	0	46.0	116.0	336.0	87.9
Zirconium	mg/kg (dw)			1	0.50	1.54	3.00	0.84	0	1.00	1.67	3.00	0.71

Notes: Shading indicates values that exceed CCME ISQG levels.

Observations reported as less than method detection limit (MDL) were assumed to be at half of the MDL.

C.1.2.1 Benthic Invertebrates

Laberge Environmental (2003) have carried out benthic invertebrate sampling in Rose Creek, Anvil Creek and Vangorda Creek as part of their annual biological monitoring program. The benthic invertebrates are classified and enumerated; however no metal analyses were carried out on the samples. In general, it is reported that the benthic communities in these three watersheds are healthy and do not seem to be influenced by high metal concentrations in the sediments.

The Selkirk First Nations report provides results on metal analyses for Anvil Creek and the Pelly River (White Mountain Environmental 2005). Table C.1.2-3 provides a summary of the data for Anvil Creek and Pelly River. As seen from the table, mean concentrations of manganese and zinc in benthic organisms are higher in Anvil Creek than in benthic organisms in Pelly River. All other COPC concentrations in benthic organisms are higher in Pelly River.

TABLE C.1.2-3
SUMMARY OF METAL CONCENTRATIONS IN BENTHIC ORGANISMS IN ANVIL CREEK AND PELLY RIVER

COPC	Measured Metal Concentrations (µg/g wet wt.) Anvil Creek Locations				Measured Metal Concentrations (µg/g wet wt.) Pelly River Locations						Mean Metal Concentrations (µg/g wet wt.) Anvil Creek	Mean Metal Concentrations (µg/g wet wt.) Pelly River
	A1	A2	A3	A4	PB	P1A	P2	P3	P6	P5&7		
Arsenic	0.11	0.18	0.17	0.1	0.38	0.07	0.18	0.09	0.09	0.39	0.15	0.2
Cadmium	0.0842	0.214	0.121	0.15	0.256	0.574	0.161	0.216	0.236	0.926	0.14	0.39
Copper	1.67	2.36	2.36	2.17	3.94	6.97	1.48	0.84	1.29	6	2.14	3.42
Lead	0.491	6.39	0.578	0.491	4.3	0.085	0.404	0.315	1.02	24.3	1.99	5.07
Manganese	43.8	28	47.2	65.1	32.2	5.9	10.7	17.7	7.6	31	46.03	17.52
Nickel	0.22	0.37	0.42	0.27	1.54	0.25	0.62	0.33	0.45	1.1	0.32	0.72
Silver	0.011	0.019	0.012	0.011	0.028	0.048	0.011	0.005	0.011	0.05	0.01	0.03
Tin	1.39	1.53	0.75	0.7	2.21	1.32	1.45	1.99	1.29	15.1	1.09	3.89
Zinc	35.1	48.9	44.8	63.6	46.3	45.9	18.3	14.5	19.6	112	48.10	42.77

C.1.3 FISH AND FISH HABITAT SURVEYS

Fish flesh samples from slimy sculpin and Arctic grayling were collected and analyzed for metals concentrations during the Aquatic Life Sampling and Testing Program conducted in August 2004. Table C.1.3-1 lists the six sampling locations in the Rose Creek and Vangorda watersheds selected for the program to track the presence, relative abundance and condition of fish. Although sampling station R1 was not identified as control station in the sampling and testing program report (White Mountain Environmental Consulting 2004), it is located upstream of the confluence of North and South forks of Rose Creek and considered as a background station in the water quality sampling program.

**TABLE C.1.3-1
FISH SAMPLING STATIONS**

Rose Creek	
R1	South Fork of Rose Creek immediately upstream of the confluence of North and South Forks of Rose Creek
R2	In the mixing zone downstream of the intersection of Rose Creek and the tailings pond discharge channel
R4	Rose Creek just upstream of the confluence with Anvil Creek
R6	Anvil Creek just upstream of the confluence with Rose Creek (control site)
Vangorda Creek	
V8	Lower Vangorda Creek below the town access road
B1	Blind Creek near the lower bridge (control site)

A summary of metal concentrations in Arctic grayling tissue collected in Rose Creek watershed is given in Table C.1.3-2 and a similar summary for Vangorda Creek watershed is given in Table C.1.3-3. Slimy sculpin tissue samples are summarized in Tables C.1.3-4 and C.1.3-5 for Rose Creek and Vangorda Creek, respectively.

Concentrations of aluminum, antimony, barium, beryllium, bismuth, chromium, lithium, molybdenum, nickel, silicon, uranium and zirconium in Arctic grayling are all below the laboratory MDL for both upstream and downstream stations in Rose Creek and Vangorda Creek. Metal concentrations in Arctic graylings sampled in the downstream stations are not consistently higher or lower than the upstream stations.

Concentrations of antimony, beryllium, lithium, molybdenum, uranium and zirconium in slimy sculpin are below the MDL for both upstream and downstream stations in Rose Creek and Vangorda Creek. The list is shorter than the one for Arctic grayling and concentrations of many metals are found to be consistently higher in slimy sculpin than in Arctic grayling. These include aluminum, arsenic, barium, cadmium, calcium, iron, lead, magnesium, manganese, phosphorus, silicon, sodium, strontium, titanium and zinc.

Mean aluminum, iron and silicon concentrations in slimy sculpin are found to be higher in samples collected at downstream stations than in samples collected at upstream stations for both Rose Creek and Vangorda Creek watersheds.

TABLE C.1.3-2
SUMMARY OF METAL CONCENTRATIONS IN ARCTIC GRAYLING –
ROSE CREEK

Total Metals	Units	Upstream Stations (N=10)			Mean	Downstream Stations (N=8)			Mean
		No. of obs. <MDL	Minimum	Maximum		No. of obs. <MDL	Minimum	Maximum	
Aluminum	µg/g (ww)	10	1	1	1	8	1	1	1
Antimony	µg/g (ww)	10	0.05	0.05	0.05	8	0.05	0.05	0.05
Arsenic	µg/g (ww)	6	0.05	0.13	0.079	3	0.05	0.14	0.099
Barium	µg/g (ww)	10	0.25	0.25	0.25	8	0.25	0.25	0.25
Beryllium	µg/g (ww)	10	0.025	0.025	0.025	8	0.025	0.025	0.025
Bismuth	µg/g (ww)	10	0.1	0.1	0.1	8	0.1	0.1	0.1
Cadmium	µg/g (ww)	5	0.0025	0.03	0.0098	3	0.0025	0.042	0.012
Calcium	µg/g (ww)	1	50	1110	475	5	50	790	193
Chromium	µg/g (ww)	10	0.1	0.1	0.1	8	0.1	0.1	0.1
Cobalt	µg/g (ww)	7	0.025	0.075	0.039	4	0.025	0.11	0.051
Copper	µg/g (ww)	0	0.58	1	0.73	0	0.59	1.5	0.82
Iron	µg/g (ww)	3	2.5	15	6	4	2.5	15	5.4
Lead	µg/g (ww)	9	0.025	0.062	0.029	6	0.025	0.068	0.034
Lithium	µg/g (ww)	10	0.25	0.25	0.25	8	0.25	0.25	0.25
Magnesium	µg/g (ww)	0	160	200	185	0	160	200	184
Manganese	µg/g (ww)	10	1	1	1	7	1	4	1.38
Mercury	µg/g (ww)	0	0.015	0.1	0.042	0	0.017	0.055	0.034
Molybdenum	µg/g (ww)	10	0.25	0.25	0.25	8	0.25	0.25	0.25
Nickel	µg/g (ww)	10	0.1	0.1	0.1	8	0.1	0.1	0.1
Phosphorus	µg/g (ww)	0	2180	2850	2476	0	2180	2630	2386
Potassium	µg/g (ww)	0	3780	4440	4051	0	4050	4510	4200
Selenium	µg/g (ww)	0	0.99	1.68	1.35	0	0.95	1.91	1.37
Silicon	µg/g (ww)	10	10	10	10	8	10	10	10
Silver	µg/g (ww)	0	0.053	0.22	0.12	0	0.052	0.16	0.081
Sodium	µg/g (ww)	0	630	780	708	0	620	760	681
Strontium	µg/g (ww)	7	0.25	0.91	0.39	7	0.25	0.66	0.3
Tin	µg/g (ww)	0	0.69	0.9	0.83	0	0.79	0.88	0.84
Titanium	µg/g (ww)	10	0.1	0.1	0.1	6	0.1	0.26	0.14
Uranium	µg/g (ww)	10	0.1	0.1	0.1	8	0.1	0.1	0.1
Vanadium	µg/g (ww)	0	0.18	0.22	0.19	0	0.17	0.22	0.19
Zinc	µg/g (ww)	0	6.84	11.8	8.8	0	6.29	13.6	8.4
Zirconium	µg/g (ww)	10	0.25	0.25	0.25	8	0.25	0.25	0.25

Notes: N = total number of fish samples
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.
Upstream stations – R1 and R6
Downstream stations – R2 and R4

TABLE C.1.3-3
SUMMARY OF METAL CONCENTRATIONS IN ARCTIC GRAYLING –
VANGORDA CREEK

Total Metals	Units	Upstream Stations (N=5)				Downstream Stations (N=5)			
		No. of obs. <MDL	Minimum	Maximum	Mean	No. of obs. <MDL	Minimum	Maximum	Mean
Aluminum	µg/g (ww)	5	1	1	1	5	1	1	1
Antimony	µg/g (ww)	5	0.05	0.05	0.05	5	0.05	0.05	0.05
Arsenic	µg/g (ww)	1	0.05	0.13	0.11	3	0.05	0.14	0.082
Barium	µg/g (ww)	5	0.25	0.25	0.25	5	0.25	0.25	0.25
Beryllium	µg/g (ww)	5	0.025	0.025	0.025	5	0.025	0.025	0.025
Bismuth	µg/g (ww)	5	0.1	0.1	0.1	5	0.1	0.1	0.1
Cadmium	µg/g (ww)	1	0.0025	0.022	0.012	0	0.02	0.056	0.033
Calcium	µg/g (ww)	2	50	690	276	3	50	710	262
Chromium	µg/g (ww)	5	0.1	0.1	0.1	5	0.1	0.1	0.1
Cobalt	µg/g (ww)	5	0.025	0.025	0.025	5	0.025	0.025	0.025
Copper	µg/g (ww)	2	0.25	0.63	0.44	3	0.25	0.88	0.44
Iron	µg/g (ww)	4	2.5	6.2	3.24	5	2.5	2.5	2.5
Lead	µg/g (ww)	5	0.025	0.025	0.025	3	0.025	0.083	0.043
Lithium	µg/g (ww)	5	0.25	0.25	0.25	5	0.25	0.25	0.25
Magnesium	µg/g (ww)	0	180	220	196	0	160	180	170
Manganese	µg/g (ww)	5	1	1	1	5	1	1	1
Mercury	µg/g (ww)	0	0.035	0.067	0.046	0	0.027	0.115	0.051
Molybdenum	µg/g (ww)	5	0.25	0.25	0.25	5	0.25	0.25	0.25
Nickel	µg/g (ww)	5	0.1	0.1	0.1	5	0.1	0.1	0.1
Phosphorus	µg/g (ww)	0	2220	2610	2356	0	2040	2450	2216
Potassium	µg/g (ww)	0	4020	4300	4182	0	3720	4190	4028
Selenium	µg/g (ww)	0	1.06	1.68	1.35	0	1.34	2.08	1.61
Silicon	µg/g (ww)	5	10	10	10	5	10	10	10
Silver	µg/g (ww)	2	0.025	0.15	0.082	0	0.056	0.12	0.089
Sodium	µg/g (ww)	0	650	680	670	0	630	700	656
Strontium	µg/g (ww)	4	0.25	0.63	0.33	4	0.25	0.6	0.32
Tin	µg/g (ww)	0	0.82	0.9	0.86	0	0.81	0.88	0.85
Titanium	µg/g (ww)	5	0.1	0.1	0.1	5	0.1	0.1	0.1
Uranium	µg/g (ww)	5	0.1	0.1	0.1	5	0.1	0.1	0.1
Vanadium	µg/g (ww)	0	0.18	0.19	0.18	0	0.17	0.2	0.18
Zinc	µg/g (ww)	0	6.02	7.05	6.5	0	6.1	11.6	8.1
Zirconium	µg/g (ww)	5	0.25	0.25	0.25	5	0.25	0.25	0.25

Notes: N = total number of fish samples
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.
Upstream station – B1
Downstream station – V8

TABLE C.1.3-4
SUMMARY OF METAL CONCENTRATIONS IN SLIMY SCULPIN –
ROSE CREEK

Total Metals	Units	Upstream Stations (N=9)				Downstream Stations (N=6)			
		No. of obs. <MDL	Minimum	Maximum	Mean	No. of obs. <MDL	Minimum	Maximum	Mean
Aluminum	µg/g (ww)	3	1	30.5	11.4	0	3.6	126	40.2
Antimony	µg/g (ww)	9	0.05	0.05	0.05	6	0.05	0.05	0.05
Arsenic	µg/g (ww)	2	0.05	0.16	0.11	0	0.17	0.25	0.19
Barium	µg/g (ww)	0	0.96	6.64	2.34	0	1.5	4.7	3.28
Beryllium	µg/g (ww)	9	0.025	0.025	0.025	6	0.025	0.025	0.025
Bismuth	µg/g (ww)	8	0.1	0.47	0.14	6	0.1	0.1	0.1
Cadmium	µg/g (ww)	1	0.0025	0.0765	0.038	0	0.016	0.0773	0.053
Calcium	µg/g (ww)	0	3140	21900	10407	0	5410	14500	9567
Chromium	µg/g (ww)	9	0.1	0.125	0.11	5	0.1	0.31	0.14
Cobalt	µg/g (ww)	6	0.025	0.073	0.04	2	0.025	0.2	0.11
Copper	µg/g (ww)	2	0.25	1.1	0.7	0	0.85	1.6	1.16
Iron	µg/g (ww)	0	7.3	87.5	36.3	0	21	251	91.3
Lead	µg/g (ww)	0	0.058	1.41	0.28	0	0.19	0.31	0.24
Lithium	µg/g (ww)	9	0.25	0.25	0.25	6	0.25	0.25	0.25
Magnesium	µg/g (ww)	0	220	410	291	0	200	430	280
Manganese	µg/g (ww)	0	9.8	57.2	29.3	0	17	66.5	37.5
Mercury	µg/g (ww)	0	0.012	0.049	0.027	0	0.015	0.05	0.028
Molybdenum	µg/g (ww)	9	0.25	0.25	0.25	6	0.25	0.25	0.25
Nickel	µg/g (ww)	9	0.1	0.1	0.1	4	0.1	0.27	0.16
Phosphorus	µg/g (ww)	0	3690	12200	6962	0	4650	9060	6672
Potassium	µg/g (ww)	0	2620	3010	2861	0	2660	2740	2693
Selenium	µg/g (ww)	0	0.5	1.45	0.98	0	0.73	1.02	0.88
Silicon	µg/g (ww)	6	10	53	20.3	2	10	70	41
Silver	µg/g (ww)	9	0.025	0.025	0.025	5	0.025	0.078	0.034
Sodium	µg/g (ww)	0	1000	1300	1133	0	1000	1300	1083
Strontium	µg/g (ww)	0	3.3	20	9.5	0	8.14	21.1	12.7
Tin	µg/g (ww)	0	0.76	0.87	0.81	0	0.83	0.88	0.85
Titanium	µg/g (ww)	0	0.38	1.3	0.72	0	0.55	1.8	1.21
Uranium	µg/g (ww)	9	0.1	0.1	0.1	6	0.1	0.1	0.1
Vanadium	µg/g (ww)	0	0.1	0.23	0.17	0	0.1	0.58	0.26
Zinc	µg/g (ww)	0	30.5	75.8	47.7	0	31	57.6	42.4
Zirconium	µg/g (ww)	9	0.25	0.25	0.25	6	0.25	0.25	0.25

Notes: N = total number of fish samples
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.
Upstream stations – R1 and R6
Downstream stations – R2 and R4

TABLE C.1.3-5
SUMMARY OF METAL CONCENTRATIONS IN SLIMY SCULPIN –
VANGORDA CREEK

Total Metals	Units	Upstream Stations (N=3)				Downstream Stations (N=5)			
		No. of obs. <MDL	Minimum	Maximum	Mean	No. of obs. <MDL	Minimum	Maximum	Mean
Aluminum	µg/g (ww)	0	8.6	11	9.7	0	9.8	34.7	21.3
Antimony	µg/g (ww)	3	0.05	0.1	0.067	5	0.05	0.05	0.05
Arsenic	µg/g (ww)	1	0.1	0.16	0.12	0	0.15	0.24	0.19
Barium	µg/g (ww)	0	2.7	5.7	4.43	0	1.6	3.2	2.34
Beryllium	µg/g (ww)	3	0.025	0.05	0.033	5	0.025	0.025	0.025
Bismuth	µg/g (ww)	2	0.1	0.83	0.34	5	0.1	0.1	0.1
Cadmium	µg/g (ww)	0	0.077	0.164	0.11	0	0.134	0.248	0.18
Calcium	µg/g (ww)	0	5260	13400	10320	0	7700	14600	10782
Chromium	µg/g (ww)	2	0.125	0.55	0.27	5	0.125	0.125	0.13
Cobalt	µg/g (ww)	3	0.025	0.05	0.033	4	0.025	0.059	0.032
Copper	µg/g (ww)	0	0.62	1.3	0.87	0	0.66	0.87	0.79
Iron	µg/g (ww)	0	14	50.6	29.9	0	33	75.5	51.1
Lead	µg/g (ww)	1	0.025	0.12	0.07	0	0.085	0.21	0.16
Lithium	µg/g (ww)	3	0.25	0.5	0.33	5	0.25	0.25	0.25
Magnesium	µg/g (ww)	0	220	340	277	0	250	320	284
Manganese	µg/g (ww)	0	7.1	12	9.2	0	4.6	9.2	6.7
Mercury	µg/g (ww)	0	0.032	0.042	0.036	0	0.022	0.055	0.043
Molybdenum	µg/g (ww)	3	0.25	0.5	0.33	5	0.25	0.25	0.25
Nickel	µg/g (ww)	3	0.1	0.25	0.15	5	0.1	0.1	0.1
Phosphorus	µg/g (ww)	0	3900	8410	6790	0	5680	9070	7198
Potassium	µg/g (ww)	0	2600	2880	2750	0	2290	2810	2604
Selenium	µg/g (ww)	0	1.2	1.6	1.42	0	2.39	3.25	2.67
Silicon	µg/g (ww)	2	10	29	21.3	0	25	61	43.2
Silver	µg/g (ww)	3	0.025	0.05	0.033	5	0.025	0.025	0.025
Sodium	µg/g (ww)	0	1000	1200	1067	0	1000	1100	1040
Strontium	µg/g (ww)	0	7.6	20.4	15.3	0	8.88	15.9	11.9
Tin	µg/g (ww)	0	0.7	1.6	1.01	0	0.7	0.77	0.74
Titanium	µg/g (ww)	0	0.57	0.82	0.72	0	0.53	1.2	0.91
Uranium	µg/g (ww)	3	0.1	0.25	0.15	5	0.1	0.1	0.1
Vanadium	µg/g (ww)	0	0.14	0.19	0.16	0	0.19	0.34	0.26
Zinc	µg/g (ww)	0	22	42.9	31.3	0	50.8	58.2	55.1
Zirconium	µg/g (ww)	3	0.25	0.5	0.33	5	0.25	0.25	0.25

Notes: N = total number of fish samples
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.
Upstream station – B1
Downstream station – V8

C.2 Terrestrial Environment

In a 2004 Terrestrial Effects Study for the Anvil Range Mine Complex (Gartner Lee Limited 2005b), soil and terrestrial vegetation samples were collected at locations around the Faro mine site and Vangorda Plateau mine site. Samples were also collected at control locations around the Swim Lake basin area. Data from a 2002 study (C.E. Jones & Associates Ltd. 2003) were also included in this assessment.

C.2.1 SOIL DATA

Soil data were provided by Gartner Lee Limited (Gartner Lee Limited 2005). Both surface and subsurface samples were collected in affected area (around the Faro mine site and Vangorda Plateau mine site), as well as reference sites (Swim Lakes area). Only the samples classified as “Surface Organic” and “Surface Mineral” were considered in this assessment.

Table C.2.1-1 summarizes metal concentrations in reference surface soil samples and Table C.2.1-2 summarizes the soil samples from affected area. The CCME soil guidelines for agricultural land uses are also included (CCME 2003).

Mean boron and cadmium concentrations in soil exceed the CCME guidelines in both affected area and the reference sites, indicating the observed high concentrations of boron and cadmium in soil are probably natural to the area and not a result of the mining activities.

Mean lead and zinc concentrations in soil exceed the CCME guidelines in affected area, but not the reference sites. Since the Anvil Range Mining Complex produced lead and zinc concentrates, the affected area is expected to have substantially higher lead and zinc levels in soil when compared to the reference sites. In general, the soil concentrations in affected area are higher than the reference sites for most metals.

For the purpose of ecological risk assessment, receptors are to be placed in different area in the mining complex. These receptor locations are defined based on the spatial distribution of lead and zinc concentrations in soil and they are shown in Figure C.2.1-1.

For small local mammals and terrestrial birds, five smaller receptor locations are considered: Background (around Swim Lake), Van-S (around Grum Mine Site), Faro-S (around Faro Mine Site), Faro-N (north of Faro-S) and Faro-W (west of Faro-S). The background area includes a couple of samples that are not originally classified as reference sites.

Larger areas are defined for the medium ranging mammals such as bear and fox: Van-M (a larger area around Grum Mine Site which includes Van-S), Faro-M (a larger area around Faro Mine

Site which includes Faro-S) and Background (same as the background used for small local mammals). Mount Mye area, where sheep habitat value was identified as high, was used to assess the risk for fannin sheep.

TABLE C.2.1-1
SOIL DATA SUMMARY – REFERENCE SITES

Metals	Units	No. of obs.	No. of obs. <MDL	CCME Guidelines	Minimum	Mean	Maximum
Aluminum	mg/kg	19	0	.	157	786	3100
Antimony	mg/kg	19	19	20	5	5	5
Arsenic	mg/kg	19	0	12	0.4	0.73	1.4
Barium	mg/kg	19	0	750	26	206	787
Beryllium	mg/kg	19	19	4	0.5	0.5	0.5
Boron	mg/kg	19	1	2	0.5	7.6	26.5
Cadmium	mg/kg	19	3	1.4	0.25	1.76	9.7
Calcium	mg/kg	19	0	.	2970	13686	29600
Chromium	mg/kg	19	18	64	1	1.11	3
Cobalt	mg/kg	19	13	40	0.5	1.39	7
Copper	mg/kg	19	0	63	3	10.6	29
Iron	mg/kg	19	0	.	287	1075	4250
Lead	mg/kg	19	1	70	2.5	9.9	17.5
Magnesium	mg/kg	19	0	.	310	1583	4090
Manganese	mg/kg	19	0	.	66	628	4390
Mercury	mg/kg	19	2	6.6	0.005	0.11	0.31
Molybdenum	mg/kg	19	16	5	2	2.58	7
Nickel	mg/kg	19	8	50	1	3.53	13
Phosphorus	mg/kg	19	0	.	586	930	1530
Potassium	mg/kg	19	0	.	677	1227	1970
Selenium	mg/kg	19	1	1	0.1	0.57	1.1
Silver	mg/kg	19	18	20	1	1.05	2
Sodium	mg/kg	19	5	.	2.5	31.8	138
Strontium	mg/kg	19	0	.	12	60	114
Tin	mg/kg	19	19	5	2.5	2.5	2.5
Titanium	mg/kg	19	0	.	5	18.9	70
Vanadium	mg/kg	19	8	130	0.5	1.97	8
Zinc	mg/kg	19	0	200	30	118	480
Zirconium	mg/kg	19	18	.	0.5	0.53	1

Notes: CCME Guidelines = Canadian Council of Ministers of the Environment guidelines for soil (agricultural land uses) (CCME 2003)

Shading indicates values that exceed CCME guidelines.

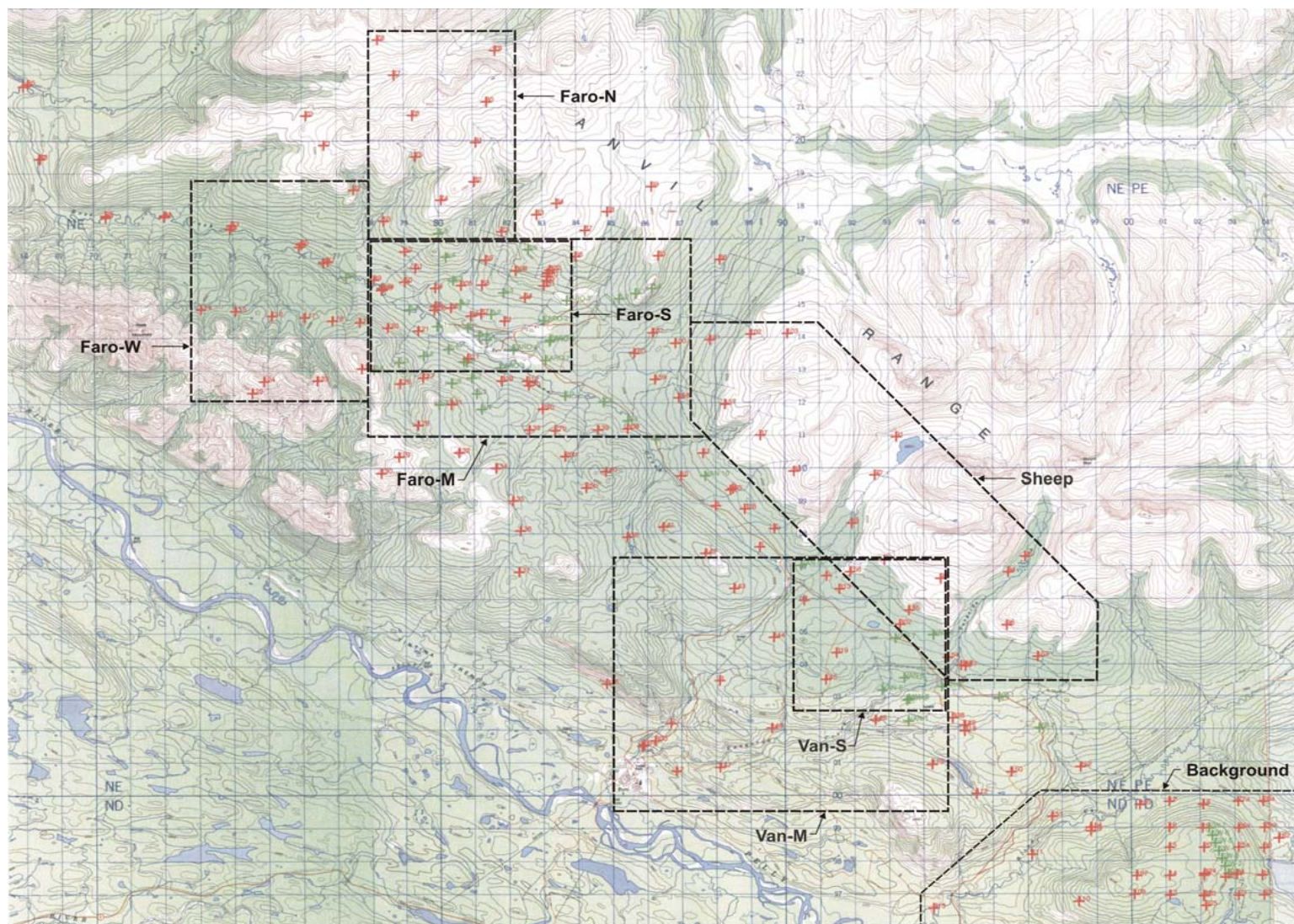
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.1-2
SOIL DATA SUMMARY – AFFECTED AREA

Metals	Units	No. of obs.	No. of obs. <MDL	CCME Guidelines	Minimum	Mean	Maximum
Aluminum	mg/kg	59	0		247	3323	24200
Antimony	mg/kg	59	59	20	5	5	5
Arsenic	mg/kg	59	0	12	0.5	8.7	64.8
Barium	mg/kg	59	0	750	46	330	961
Beryllium	mg/kg	59	59	4	0.5	0.5	0.5
Boron	mg/kg	59	12	2	0.5	4.65	18
Cadmium	mg/kg	59	9	1.4	0.25	1.81	12.4
Calcium	mg/kg	59	0		848	11672	36600
Chromium	mg/kg	59	16	64	1	6.7	45
Cobalt	mg/kg	59	9	40	0.5	3.4	21
Copper	mg/kg	59	0	63	5	39.6	272
Iron	mg/kg	59	0		533	7562	37100
Lead	mg/kg	59	0	70	5	588	5930
Magnesium	mg/kg	59	0		374	1890	10100
Manganese	mg/kg	59	0		37	487	4360
Mercury	mg/kg	59	0	6.6	0.02	0.57	4.3
Molybdenum	mg/kg	59	56	5	2	2.17	6
Nickel	mg/kg	59	4	50	1	8.7	55
Phosphorus	mg/kg	59	0		552	917	2360
Potassium	mg/kg	59	0		408	1140	3610
Selenium	mg/kg	59	9	1	0.1	0.54	2
Silver	mg/kg	59	54	20	1	1.19	6
Sodium	mg/kg	59	9		2.5	51.1	324
Strontium	mg/kg	59	0		5	54	169
Tin	mg/kg	59	49	5	2.5	3.14	8
Titanium	mg/kg	59	0		8	86	560
Vanadium	mg/kg	59	2	130	0.5	7.5	40
Zinc	mg/kg	59	0	200	47	496	3050
Zirconium	mg/kg	59	34		0.5	1.18	7

Notes: CCME Guidelines = Canadian Council of Ministers of the Environment guidelines for soil (agricultural land uses) (CCME 2003)
Shading indicates values that exceed CCME guidelines.
Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.

FIGURE C.2.1-1
LOCATIONS CONSIDERED IN TERRESTRIAL ASSESSMENT



The mean concentrations of each receptor location are summarized in Table C.2.1-3. An overall mean is also calculated for each metal for large broad ranging mammals (e.g. caribou, moose and wolf) which are assumed to be at the site for only a portion of the year as their home range is much larger than the size of the Anvil Range Mine site.

The metal concentrations are generally highest in Faro-S, providing a worst-case scenario, and lowest in background. When comparing metal concentrations in soil measured around the Faro mine site and the Vangorda mine site, higher mean calcium, chromium, magnesium, manganese, nickel, strontium and tin concentrations are found in areas around the Vangorda mine site and higher mean concentrations for copper, lead, mercury and zinc are found in Faro mine site.

There is only one sample from the Mount Mye area and the metal concentrations are generally lower or close to the background level.

TABLE C.2.1-3
SOIL DATA SUMMARY – BY RECEPTOR LOCATIONS

Metals	CCME Guidelines	Background	Faro-M	Faro-S	Faro-N	Faro-W	Van-M	Van-S	Sheep	Overall
		N=21	N=24	N=15	N=5	N=13	N=8	N=4	N=1	N=78
Aluminum		1255	3807	3662	4928	2448	3668	4735	247	2705
Antimony	20	5	5	5	5	5	5	5	5	5
Arsenic	12	1.24	11.2	15.4	3.02	11.5	5.6	9.3	0.5	6.7
Barium	750	217	347	389	174	322	398	250	46	300
Beryllium	4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Boron	2	7.5	4.33	5.2	2.8	4.19	6.1	4.13	4	5.4
Cadmium	1.4	1.71	1.69	2.01	2.12	1.5	1.41	0.93	0.6	1.79
Calcium		13725	8945	10367	9318	10311	17645	15713	6890	12162
Chromium	64	1.95	7.2	7.1	5	6.5	8.8	10.8	1	5.3
Cobalt	40	1.74	4	4	2.4	3.08	3.44	4.25	0.5	2.91
Copper	63	11.7	53.8	70.8	19.8	43.5	21.1	23.8	6	32.6
Iron		2019	8778	9838	6318	8453	6430	8268	553	5982
Lead	70	10	946	1325	124	713	93.5	141	18	447
Magnesium		1748	1822	1809	1334	1599	2805	2568	942	1815
Manganese		625	433	263	247	408	875	671	665	521
Mercury	6.6	0.11	0.9	1.29	0.22	0.57	0.19	0.25	0.08	0.46
Molybdenum	5	2.52	2.29	2	2	2	2.38	2	2	2.27
Nickel	50	4.71	8.7	8.5	5	7.6	13.4	14	1	7.4
Phosphorus		933	915	840	948	827	1036	942	743	920
Potassium		1207	1192	1124	1002	1140	944	851	1080	1161
Selenium	1	0.57	0.52	0.6	0.4	0.55	0.45	0.43	0.1	0.54
Silver	20	1.05	1.46	1.73	1	1	1	1	1	1.15
Sodium		34.3	61.8	59.4	53.9	42.7	57.4	45.3	37	46.4
Strontium		59.3	44.9	48.3	48.2	43.2	91.8	82.8	41	55.4
Tin	5	2.5	3.08	2.73	3	3.12	3.63	4.75	7	2.99
Titanium		29.5	94.9	90.3	94.4	93.4	72.7	70	8	69.6
Vanadium	130	3.31	7.4	7.4	10.6	7.4	7.4	8	0.5	6.1
Zinc	200	117	710	896	150	557	252	279	169	404
Zirconium		0.6	1.33	1.63	0.6	1.38	1.25	1.88	0.5	1.02

Notes: CCME Guidelines = Canadian Council of Ministers of the Environment guidelines for soil (agricultural land uses) (CCME 2003)

Shading indicates values that exceed CCME guidelines.

All concentrations are in mg/kg and analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of the mean.

C.2.2 TERRESTRIAL VEGETATION DATA

Vegetation samples were collected in 2002 and 2004. Forbs, grasses, horsetails and Labrador tea, berries, willow, tree sap, bear root, mushroom and lichen samples were collected in affected area and reference sites (Swim Lake basin). Only arsenic, cadmium, chromium, copper, lead, mercury, selenium, silver and zinc were analyzed for samples collected in the 2002 sampling program.

Tables C.2.2-1 to C.2.2-10 summarize metal concentrations for each vegetation type. Mean lead and zinc concentrations in samples from affected area are consistently higher than background samples with the exception of horsetail, in which higher zinc concentration is found in the single background sample.

Forage, browse, berries and lichen are consumed by wildlife in the area. In the ecological risk assessment, forbs, grass, horsetail and Labrador tea were grouped as forage and willow as browse and their concentrations are summarized for each receptor locations as defined in Section C.2.1. Tables C.2.2-11, C.2.2-12 and C.2.2-13 present the mean concentrations in berries, browse and forage at each area, respectively. Dry weight concentrations reported by the laboratory are converted to fresh rate based on the reported sample moisture content. However, moisture content was only reported in the 2004 data and not in the 2002 data. Average moisture content by each species was estimated using 2004 data and applied to the 2002 data.

Mean lead and zinc concentration are highest in Faro-S for all three vegetation types with the exception of zinc in forage, which is consistent with the soil data. Mean concentrations in berries are found to be highest in Van-M for most of the metals.

TABLE C.2.2-1
SUMMARY OF METAL CONCENTRATIONS IN BERRIES

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	11	0	2	6.5	21.1	22	0	1.3	7.1	41.3
Antimony	µg/g (dw)	11	11	0.05	0.05	0.05	22	22	0.05	0.05	0.05
Arsenic	µg/g (dw)	14	14	0.05	0.15	0.5	30	29	0.05	0.17	0.5
Barium	µg/g (dw)	11	0	1.4	8.4	22	22	0	2	9.5	20.1
Beryllium	µg/g (dw)	11	11	0.01	0.01	0.01	22	22	0.01	0.01	0.01
Boron	µg/g (dw)	11	0	3	9.6	20	22	0	3	12.2	24
Cadmium	µg/g (dw)	14	7	0.01	0.062	0.22	30	10	0.01	0.11	0.56
Calcium	µg/g (dw)	11	0	505	2353	11700	22	0	666	1369	4340
Chromium	µg/g (dw)	14	6	0.025	0.082	0.2	30	9	0.025	0.21	1.1
Cobalt	µg/g (dw)	11	11	0.05	0.05	0.05	22	22	0.05	0.05	0.05
Copper	µg/g (dw)	14	0	2	3.4	5.2	30	0	2.2	5.1	10.1
Iron	µg/g (dw)	11	0	28	42.6	61	22	0	11	32.8	78
Lead	µg/g (dw)	14	13	0.05	0.082	0.2	30	13	0.05	0.74	4
Magnesium	µg/g (dw)	11	0	379	1127	4730	22	0	393	1176	4010
Manganese	µg/g (dw)	11	0	5.3	97	384	22	0	5.2	65.4	253
Mercury	µg/g (dw)	14	14	0.005	0.005	0.005	30	27	0.005	0.0062	0.02
Molybdenum	µg/g (dw)	11	5	0.05	0.94	7	22	13	0.05	0.43	2.5
Nickel	µg/g (dw)	14	4	0.05	0.39	1.4	30	2	0.05	0.94	5.2
Phosphorus	µg/g (dw)	11	0	2230	5387	10800	22	0	2330	5215	11500
Potassium	µg/g (dw)	11	0	5650	10492	18200	22	0	5900	10437	18100
Selenium	µg/g (dw)	14	12	0.1	0.46	3.5	30	30	0.1	0.21	0.5
Silicon	µg/g (dw)	11	0	238	347	488	22	0	106	224	425
Silver	µg/g (dw)	14	9	0.005	0.013	0.1	30	23	0.005	0.011	0.07
Sodium	µg/g (dw)	11	8	0.5	1.55	11	22	7	0.5	9.6	33
Strontium	µg/g (dw)	11	0	1.14	4.74	23	22	0	0.76	4.19	20.9
Tellurium	µg/g (dw)	11	11	0.05	0.05	0.05	22	22	0.05	0.05	0.05
Thallium	µg/g (dw)	11	11	0.01	0.01	0.01	22	22	0.01	0.01	0.01
Tin	µg/g (dw)	11	10	0.05	0.064	0.2	22	20	0.05	0.14	1.7
Titanium	µg/g (dw)	11	0	0.7	1.27	2.3	22	0	0.4	1.07	2.9
Uranium	µg/g (dw)	11	11	0.02	0.02	0.02	22	22	0.02	0.02	0.02
Vanadium	µg/g (dw)	11	11	0.25	0.25	0.25	22	22	0.25	0.25	0.25
Zinc	µg/g (dw)	14	0	3.1	10.8	23	30	0	5	16.2	43
Zirconium	µg/g (dw)	11	11	1.5	1.5	1.5	22	22	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-2
SUMMARY OF METAL CONCENTRATIONS IN FORBS

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	3	0	10.4	18.5	33.1	7	0	10.2	21.2	49.6
Antimony	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Arsenic	µg/g (dw)	3	2	0.05	0.1	0.2	7	6	0.05	0.057	0.1
Barium	µg/g (dw)	3	0	55.9	81.5	123	7	0	26.4	112	269
Beryllium	µg/g (dw)	3	3	0.01	0.01	0.01	7	6	0.01	0.02	0.08
Boron	µg/g (dw)	3	0	14	19.3	29	7	0	9	18.3	31
Cadmium	µg/g (dw)	3	0	0.03	0.51	1.03	7	0	0.16	0.46	0.71
Calcium	µg/g (dw)	3	0	14600	23667	33500	7	0	15700	21743	26400
Chromium	µg/g (dw)	3	0	0.2	0.27	0.4	7	0	0.1	0.24	0.6
Cobalt	µg/g (dw)	3	1	0.05	0.38	0.8	7	0	0.1	1.31	5.4
Copper	µg/g (dw)	3	0	4	6.5	9.9	7	0	6.3	8.3	11.7
Iron	µg/g (dw)	3	0	84	87	92	7	0	78	96.7	144
Lead	µg/g (dw)	3	1	0.05	0.12	0.2	7	0	0.2	0.97	4.3
Magnesium	µg/g (dw)	3	0	4460	6240	7820	7	0	3480	6254	10300
Manganese	µg/g (dw)	3	0	90.6	272	617	7	0	111	225	312
Mercury	µg/g (dw)	3	3	0.005	0.005	0.005	7	4	0.005	0.0087	0.019
Molybdenum	µg/g (dw)	3	0	0.4	5.7	9.9	7	0	0.1	0.97	3.7
Nickel	µg/g (dw)	3	0	0.5	1.43	2.4	7	0	0.9	8.1	21.6
Phosphorus	µg/g (dw)	3	0	4600	9117	13400	7	0	4720	5959	6540
Potassium	µg/g (dw)	3	0	18000	41800	54300	7	0	16600	36943	47900
Selenium	µg/g (dw)	3	1	0.1	1.5	4.2	7	6	0.1	0.26	1.2
Silicon	µg/g (dw)	3	0	367	616	875	7	0	454	765	1160
Silver	µg/g (dw)	3	2	0.005	0.0067	0.01	7	4	0.005	0.0086	0.02
Sodium	µg/g (dw)	3	0	24	35.3	49	7	0	4	14	26
Strontium	µg/g (dw)	3	0	69.4	77.5	85.7	7	0	56.9	109	176
Tellurium	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Thallium	µg/g (dw)	3	3	0.01	0.01	0.01	7	7	0.01	0.01	0.01
Tin	µg/g (dw)	3	0	0.1	0.3	0.6	7	2	0.05	0.11	0.2
Titanium	µg/g (dw)	3	0	1.5	2.27	2.9	7	0	0.9	1.23	1.7
Uranium	µg/g (dw)	3	3	0.02	0.02	0.02	7	7	0.02	0.02	0.02
Vanadium	µg/g (dw)	3	3	0.25	0.25	0.25	7	7	0.25	0.25	0.25
Zinc	µg/g (dw)	3	0	19.7	32.7	46.8	7	0	24.3	124	648
Zirconium	µg/g (dw)	3	3	1.5	1.5	1.5	7	7	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-3
SUMMARY OF METAL CONCENTRATIONS IN GRASS

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	3	0	3.3	12.9	27.4	12	0	3	13	27.3
Antimony	µg/g (dw)	3	3	0.05	0.05	0.05	12	12	0.05	0.05	0.05
Arsenic	µg/g (dw)	3	2	0.05	0.1	0.2	38	33	0.05	0.45	3
Barium	µg/g (dw)	3	0	28.1	40.9	63.7	12	0	19.1	47.7	94.6
Beryllium	µg/g (dw)	3	3	0.01	0.01	0.01	12	9	0.01	0.025	0.13
Boron	µg/g (dw)	3	1	1	6	12	12	0	3	8	14
Cadmium	µg/g (dw)	3	0	0.02	0.18	0.48	38	8	0.01	0.13	0.46
Calcium	µg/g (dw)	3	0	5430	8563	14800	12	0	3260	6961	9750
Chromium	µg/g (dw)	3	0	0.4	0.43	0.5	38	0	0.01	0.35	2.11
Cobalt	µg/g (dw)	3	3	0.05	0.05	0.05	12	10	0.05	0.058	0.1
Copper	µg/g (dw)	3	0	2.1	5.2	9.9	38	0	1.99	3.54	6.4
Iron	µg/g (dw)	3	0	39	63	106	12	0	34	75.5	149
Lead	µg/g (dw)	3	1	0.05	0.15	0.3	38	4	0.05	8.5	85.5
Magnesium	µg/g (dw)	3	0	1500	2627	3860	12	0	1000	1800	4690
Manganese	µg/g (dw)	3	0	31.9	180	254	12	0	35.3	569	1820
Mercury	µg/g (dw)	3	3	0.005	0.005	0.005	38	15	0.005	0.018	0.06
Molybdenum	µg/g (dw)	3	0	0.2	13.4	26.3	12	0	0.2	0.91	2.5
Nickel	µg/g (dw)	3	0	0.3	1	1.4	38	0	0.3	1.32	3.6
Phosphorus	µg/g (dw)	3	0	3390	8730	12400	12	0	3030	4969	9230
Potassium	µg/g (dw)	3	0	20200	28767	40200	12	0	10400	18592	25900
Selenium	µg/g (dw)	3	1	0.1	1.47	4.1	38	34	0.1	0.42	1
Silicon	µg/g (dw)	3	0	847	1776	2550	12	0	966	1341	1900
Silver	µg/g (dw)	3	2	0.005	0.0067	0.01	38	20	0.005	0.031	0.34
Sodium	µg/g (dw)	3	0	28	33.3	36	12	0	2	6.5	19
Strontium	µg/g (dw)	3	0	23	28	32.5	12	0	16.6	34	54.3
Tellurium	µg/g (dw)	3	3	0.05	0.05	0.05	12	12	0.05	0.05	0.05
Thallium	µg/g (dw)	3	3	0.01	0.01	0.01	12	11	0.01	0.015	0.07
Tin	µg/g (dw)	3	1	0.05	0.52	1.3	12	7	0.05	0.11	0.4
Titanium	µg/g (dw)	3	0	0.8	2.2	3.3	12	0	0.5	0.9	2
Uranium	µg/g (dw)	3	3	0.02	0.02	0.02	12	12	0.02	0.02	0.02
Vanadium	µg/g (dw)	3	3	0.25	0.25	0.25	12	12	0.25	0.25	0.25
Zinc	µg/g (dw)	3	0	12.5	71	179	38	0	10	97.7	1040
Zirconium	µg/g (dw)	3	3	1.5	1.5	1.5	12	12	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-4
SUMMARY OF METAL CONCENTRATIONS IN HORSETAIL

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	1	0	7.6	7.6	7.6	9	0	4.8	8.4	13
Antimony	µg/g (dw)	1	1	0.05	0.05	0.05	9	9	0.05	0.05	0.05
Arsenic	µg/g (dw)	1	0	0.4	0.4	0.4	9	4	0.05	0.16	0.4
Barium	µg/g (dw)	1	0	103	103	103	9	0	29.6	59.7	122
Beryllium	µg/g (dw)	1	1	0.01	0.01	0.01	9	9	0.01	0.01	0.01
Boron	µg/g (dw)	1	0	34	34	34	9	0	17	23.6	37
Cadmium	µg/g (dw)	1	0	1.53	1.53	1.53	9	0	0.12	0.45	0.89
Calcium	µg/g (dw)	1	0	28200	28200	28200	9	0	24200	31044	39800
Chromium	µg/g (dw)	1	0	0.7	0.7	0.7	9	0	0.3	0.58	1.1
Cobalt	µg/g (dw)	1	0	0.1	0.1	0.1	9	0	0.1	0.36	1.3
Copper	µg/g (dw)	1	0	6.5	6.5	6.5	9	0	4.6	5.7	7.2
Iron	µg/g (dw)	1	0	70	70	70	9	0	48	91.2	156
Lead	µg/g (dw)	1	1	0.05	0.05	0.05	9	0	0.2	1.03	2.7
Magnesium	µg/g (dw)	1	0	12300	12300	12300	9	0	4560	7087	9430
Manganese	µg/g (dw)	1	0	69.7	69.7	69.7	9	0	52.7	129	286
Mercury	µg/g (dw)	1	1	0.005	0.005	0.005	9	8	0.005	0.0058	0.012
Molybdenum	µg/g (dw)	1	0	9.4	9.4	9.4	9	0	0.2	0.96	1.9
Nickel	µg/g (dw)	1	0	0.3	0.3	0.3	9	0	0.3	0.53	1.2
Phosphorus	µg/g (dw)	1	0	7610	7610	7610	9	0	3580	5577	8270
Potassium	µg/g (dw)	1	0	28400	28400	28400	9	0	19000	31878	47700
Selenium	µg/g (dw)	1	0	7.4	7.4	7.4	9	7	0.1	0.14	0.4
Silicon	µg/g (dw)	1	0	1900	1900	1900	9	0	1160	1482	1840
Silver	µg/g (dw)	1	0	0.04	0.04	0.04	9	0	0.01	0.023	0.07
Sodium	µg/g (dw)	1	0	28	28	28	9	0	32	76.2	312
Strontium	µg/g (dw)	1	0	109	109	109	9	0	75.4	124	174
Tellurium	µg/g (dw)	1	1	0.05	0.05	0.05	9	9	0.05	0.05	0.05
Thallium	µg/g (dw)	1	1	0.01	0.01	0.01	9	7	0.01	0.02	0.08
Tin	µg/g (dw)	1	0	0.2	0.2	0.2	9	2	0.05	0.17	0.4
Titanium	µg/g (dw)	1	0	1.9	1.9	1.9	9	0	0.7	1.17	1.9
Uranium	µg/g (dw)	1	1	0.02	0.02	0.02	9	9	0.02	0.02	0.02
Vanadium	µg/g (dw)	1	1	0.25	0.25	0.25	9	9	0.25	0.25	0.25
Zinc	µg/g (dw)	1	0	75.9	75.9	75.9	9	0	28.3	39.8	61.9
Zirconium	µg/g (dw)	1	1	1.5	1.5	1.5	9	9	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-5
SUMMARY OF METAL CONCENTRATIONS IN LABRADOR TEA

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	3	0	10.2	13.4	19.7	7	0	7.9	22	40.6
Antimony	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Arsenic	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Barium	µg/g (dw)	3	0	46.1	53.4	62.6	7	0	47.1	69.5	93.7
Beryllium	µg/g (dw)	3	3	0.01	0.01	0.01	7	7	0.01	0.01	0.01
Boron	µg/g (dw)	3	0	9	19.7	29	7	0	5	21	31
Cadmium	µg/g (dw)	3	3	0.01	0.01	0.01	7	4	0.01	0.016	0.03
Calcium	µg/g (dw)	3	0	4420	5713	6750	7	0	5000	5906	7150
Chromium	µg/g (dw)	3	1	0.05	0.083	0.1	7	5	0.05	0.079	0.2
Cobalt	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Copper	µg/g (dw)	3	0	2.4	3.63	5.2	7	0	2.6	4.37	6.5
Iron	µg/g (dw)	3	0	32	46.7	60	7	0	31	49.3	87
Lead	µg/g (dw)	3	3	0.05	0.05	0.05	7	0	0.2	0.77	2.6
Magnesium	µg/g (dw)	3	0	1660	2110	2400	7	0	1100	1314	1860
Manganese	µg/g (dw)	3	0	48.1	539	1180	7	0	126	412	678
Mercury	µg/g (dw)	3	3	0.005	0.005	0.005	7	7	0.005	0.005	0.005
Molybdenum	µg/g (dw)	3	2	0.05	0.37	1	7	6	0.05	0.13	0.6
Nickel	µg/g (dw)	3	2	0.05	0.13	0.3	7	1	0.05	0.36	1.1
Phosphorus	µg/g (dw)	3	0	3930	4440	5290	7	0	2850	4171	5310
Potassium	µg/g (dw)	3	0	4450	5310	6210	7	0	4160	5423	6360
Selenium	µg/g (dw)	3	3	0.1	0.1	0.1	7	7	0.1	0.1	0.1
Silicon	µg/g (dw)	3	0	312	345	400	7	0	222	316	458
Silver	µg/g (dw)	3	2	0.005	0.01	0.02	7	6	0.005	0.0057	0.01
Sodium	µg/g (dw)	3	1	0.5	2.5	5	7	4	0.5	1.43	3
Strontium	µg/g (dw)	3	0	5.36	8.9	15.4	7	0	5.31	9.4	12.2
Tellurium	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Thallium	µg/g (dw)	3	3	0.01	0.01	0.01	7	4	0.01	0.05	0.18
Tin	µg/g (dw)	3	3	0.05	0.05	0.05	7	6	0.05	0.071	0.2
Titanium	µg/g (dw)	3	0	1.2	1.37	1.6	7	0	0.7	1.11	1.7
Uranium	µg/g (dw)	3	3	0.02	0.02	0.02	7	7	0.02	0.02	0.02
Vanadium	µg/g (dw)	3	3	0.25	0.25	0.25	7	7	0.25	0.25	0.25
Zinc	µg/g (dw)	3	0	24.2	24.7	25.3	7	0	15.4	28.7	43
Zirconium	µg/g (dw)	3	3	1.5	1.5	1.5	7	7	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-6
SUMMARY OF METAL CONCENTRATIONS IN LICHEN

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	12	0	37.3	47.9	63.1	120	0	29	103	704
Antimony	µg/g (dw)	12	12	0.05	0.05	0.05	120	95	0.05	0.098	0.7
Arsenic	µg/g (dw)	18	15	0.05	0.21	0.5	152	21	0.05	1.1	24
Barium	µg/g (dw)	12	0	6.7	16.9	37.3	120	0	5.3	44.4	317
Beryllium	µg/g (dw)	12	11	0.01	0.011	0.02	120	119	0.01	0.011	0.1
Boron	µg/g (dw)	12	10	1	1.25	3	120	114	1	1.07	3
Cadmium	µg/g (dw)	18	2	0.01	0.081	0.28	152	2	0.01	0.24	2.52
Calcium	µg/g (dw)	12	0	640	1800	3560	120	0	376	1499	7490
Chromium	µg/g (dw)	18	10	0.05	0.11	0.27	152	8	0.05	0.54	4.6
Cobalt	µg/g (dw)	12	11	0.05	0.054	0.1	120	35	0.05	0.17	1
Copper	µg/g (dw)	18	0	0.6	0.97	1.3	152	0	0.7	3.56	35.4
Iron	µg/g (dw)	12	0	63	97.7	135	120	0	53	324	1950
Lead	µg/g (dw)	18	0	0.4	1.14	1.6	152	0	0.6	60.4	747.7
Magnesium	µg/g (dw)	12	0	182	375	629	120	0	123	286	613
Manganese	µg/g (dw)	12	0	13	93.5	253	120	0	16.8	81.1	417
Mercury	µg/g (dw)	18	8	0.005	0.016	0.072	152	62	0.005	0.031	0.51
Molybdenum	µg/g (dw)	12	8	0.05	0.1	0.4	120	108	0.05	0.06	0.3
Nickel	µg/g (dw)	18	4	0.05	0.22	0.5	152	0	0.2	0.62	4.6
Phosphorus	µg/g (dw)	12	0	829	1290	1880	120	0	920	1490	2280
Potassium	µg/g (dw)	12	0	855	1121	1580	120	0	797	1205	1810
Selenium	µg/g (dw)	18	18	0.1	0.23	0.5	152	142	0.1	0.29	5
Silicon	µg/g (dw)	12	0	85	217	418	120	0	103	246	881
Silver	µg/g (dw)	18	8	0.005	0.016	0.05	152	9	0.005	0.16	1.83
Sodium	µg/g (dw)	12	0	4	15.5	48	120	5	0.5	9.1	196
Strontium	µg/g (dw)	12	0	1.82	6.4	17	120	0	1.16	6.2	22.5
Tellurium	µg/g (dw)	12	11	0.05	0.054	0.1	120	119	0.05	0.05	0.1
Thallium	µg/g (dw)	12	12	0.01	0.01	0.01	120	75	0.01	0.059	1.52
Tin	µg/g (dw)	12	10	0.05	0.075	0.3	120	84	0.05	0.47	35.1
Titanium	µg/g (dw)	12	0	1.8	2.46	3	120	0	1.8	4.06	13
Uranium	µg/g (dw)	12	12	0.02	0.02	0.02	120	119	0.02	0.02	0.04
Vanadium	µg/g (dw)	12	12	0.25	0.25	0.25	120	88	0.25	0.36	1.2
Zinc	µg/g (dw)	18	0	10.7	18.2	29.7	152	0	12.3	93.7	1043
Zirconium	µg/g (dw)	12	12	1.5	1.5	1.5	120	120	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-7
SUMMARY OF METAL CONCENTRATIONS IN MUSHROOM

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	No background samples available					10	0	4.6	175	482
Antimony	µg/g (dw)						10	10	0.05	0.05	0.05
Arsenic	µg/g (dw)						10	0	0.2	0.97	3.9
Barium	µg/g (dw)						10	0	0.3	14.5	45.7
Beryllium	µg/g (dw)						10	10	0.01	0.01	0.01
Boron	µg/g (dw)						10	10	1	1	1
Cadmium	µg/g (dw)						10	0	0.18	1.91	5.82
Calcium	µg/g (dw)						10	0	40	296	1440
Chromium	µg/g (dw)						10	2	0.05	0.64	2.2
Cobalt	µg/g (dw)						10	3	0.05	1	7.2
Copper	µg/g (dw)						10	0	10.1	40	141
Iron	µg/g (dw)						10	0	23	376	1140
Lead	µg/g (dw)						10	0	0.4	20.7	120
Magnesium	µg/g (dw)						10	0	639	900	1810
Manganese	µg/g (dw)						10	0	6.4	29.9	120
Mercury	µg/g (dw)						10	0	0.032	0.59	4.42
Molybdenum	µg/g (dw)						10	1	0.05	0.32	0.9
Nickel	µg/g (dw)						10	0	0.2	0.83	2.2
Phosphorus	µg/g (dw)						10	0	10100	17280	52600
Potassium	µg/g (dw)						10	0	17100	21520	40300
Selenium	µg/g (dw)						10	0	0.3	1.37	3.3
Silicon	µg/g (dw)						10	0	114	246	520
Silver	µg/g (dw)						10	0	0.63	3.64	25.8
Sodium	µg/g (dw)						10	3	0.5	188	1050
Strontium	µg/g (dw)						10	0	0.13	1.7	6.07
Tellurium	µg/g (dw)						10	10	0.05	0.05	0.05
Thallium	µg/g (dw)						10	8	0.01	0.015	0.05
Tin	µg/g (dw)						10	5	0.05	0.39	1.5
Titanium	µg/g (dw)						10	0	1.8	6.5	15.5
Uranium	µg/g (dw)						10	8	0.02	0.025	0.05
Vanadium	µg/g (dw)						10	6	0.25	0.52	1.5
Zinc	µg/g (dw)						10	0	59	98	202
Zirconium	µg/g (dw)						10	10	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-8
SUMMARY OF METAL CONCENTRATIONS IN ROOTS

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	No background samples available					10	0	155	1591	3180
Antimony	µg/g (dw)						10	6	0.05	0.09	0.2
Arsenic	µg/g (dw)						10	0	0.1	1.56	3.2
Barium	µg/g (dw)						10	0	29.7	66.8	123
Beryllium	µg/g (dw)						10	1	0.01	0.09	0.19
Boron	µg/g (dw)						10	0	4	15.4	26
Cadmium	µg/g (dw)						10	0	0.04	0.18	0.32
Calcium	µg/g (dw)						10	0	3930	7492	15900
Chromium	µg/g (dw)						10	0	0.2	4.17	7.6
Cobalt	µg/g (dw)						10	0	0.1	1.6	3.3
Copper	µg/g (dw)						10	0	2.7	11	17.2
Iron	µg/g (dw)						10	0	231	2907	5260
Lead	µg/g (dw)						10	0	0.4	20.9	74.6
Magnesium	µg/g (dw)						10	0	1940	2367	2970
Manganese	µg/g (dw)						10	0	51.5	83.2	124
Mercury	µg/g (dw)						10	5	0.005	0.013	0.033
Molybdenum	µg/g (dw)						10	0	0.1	2.46	6.2
Nickel	µg/g (dw)						10	0	0.7	9.2	14.3
Phosphorus	µg/g (dw)						10	0	4060	6660	13500
Potassium	µg/g (dw)						10	0	5950	8002	9990
Selenium	µg/g (dw)						10	9	0.1	0.14	0.5
Silicon	µg/g (dw)						10	0	325	857	1880
Silver	µg/g (dw)						10	7	0.005	0.032	0.11
Sodium	µg/g (dw)						10	2	0.5	35.6	76
Strontium	µg/g (dw)						10	0	23.3	50.4	123
Tellurium	µg/g (dw)						10	10	0.05	0.05	0.05
Thallium	µg/g (dw)						10	5	0.01	0.034	0.09
Tin	µg/g (dw)						10	5	0.05	0.25	1
Titanium	µg/g (dw)						10	0	5.4	57.6	140
Uranium	µg/g (dw)						10	1	0.02	0.36	1.63
Vanadium	µg/g (dw)						10	0	0.5	4.06	8.2
Zinc	µg/g (dw)						10	0	18.6	42.7	130
Zirconium	µg/g (dw)						10	10	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

**TABLE C.2.2-9
SUMMARY OF METAL CONCENTRATIONS IN SAP**

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	3	0	1.4	3.97	5.5	7	0	1.2	13.8	29.3
Antimony	µg/g (dw)	3	3	0.01	0.01	0.01	7	6	0.01	0.017	0.06
Arsenic	µg/g (dw)	3	3	0.01	0.01	0.01	7	3	0.01	0.06	0.21
Barium	µg/g (dw)	3	0	4.22	8.2	12.8	7	0	1.05	14.5	50.8
Beryllium	µg/g (dw)	3	3	0.002	0.002	0.002	7	7	0.002	0.002	0.002
Boron	µg/g (dw)	3	0	0.4	0.77	1.1	7	2	0.2	0.61	1.1
Cadmium	µg/g (dw)	3	0	0.007	0.15	0.22	7	0	0.004	0.027	0.071
Calcium	µg/g (dw)	3	0	240	466	624	7	0	76.3	635	1480
Chromium	µg/g (dw)	3	2	0.01	0.02	0.04	7	1	0.01	0.097	0.36
Cobalt	µg/g (dw)	3	2	0.01	0.027	0.06	7	3	0.01	0.031	0.08
Copper	µg/g (dw)	3	0	0.52	0.75	0.86	7	0	0.42	1.28	2.95
Iron	µg/g (dw)	3	0	2	4	6	7	0	3	42.1	137
Lead	µg/g (dw)	3	1	0.01	0.057	0.11	7	0	0.05	6.1	24.6
Magnesium	µg/g (dw)	3	0	36.1	49	64.5	7	0	14.3	56.7	108
Manganese	µg/g (dw)	3	0	15.8	27.6	49.6	7	0	3.84	18.2	50
Mercury	µg/g (dw)	3	3	0.005	0.005	0.005	7	7	0.005	0.005	0.005
Molybdenum	µg/g (dw)	3	3	0.01	0.01	0.01	7	4	0.01	0.016	0.03
Nickel	µg/g (dw)	3	1	0.01	0.017	0.02	7	1	0.01	0.079	0.19
Phosphorus	µg/g (dw)	3	0	86.3	142	185	7	0	40.7	119	273
Potassium	µg/g (dw)	3	0	177	212	263	7	0	59	163	405
Selenium	µg/g (dw)	3	3	0.02	0.02	0.02	7	7	0.02	0.02	0.02
Silicon	µg/g (dw)	3	0	36	48.7	63	7	0	17	101	318
Silver	µg/g (dw)	3	3	0.001	0.001	0.001	7	5	0.001	0.0054	0.023
Sodium	µg/g (dw)	3	0	11.7	13.1	14.2	7	0	8.5	25	49
Strontium	µg/g (dw)	3	0	0.93	1.66	2.05	7	0	0.34	3.14	7.81
Tellurium	µg/g (dw)	3	3	0.01	0.01	0.01	7	7	0.01	0.01	0.01
Thallium	µg/g (dw)	3	3	0.002	0.002	0.002	7	3	0.002	0.0063	0.012
Tin	µg/g (dw)	3	0	0.54	0.68	0.78	7	0	0.31	1.34	3.27
Titanium	µg/g (dw)	3	1	0.03	0.083	0.14	7	1	0.03	0.25	0.51
Uranium	µg/g (dw)	3	3	0.004	0.004	0.004	7	4	0.004	0.0096	0.027
Vanadium	µg/g (dw)	3	0	0.02	0.03	0.04	7	1	0.01	0.093	0.29
Zinc	µg/g (dw)	3	0	1.6	3.53	4.8	7	0	1.1	9.3	27.7
Zirconium	µg/g (dw)	3	3	0.3	0.3	0.3	7	7	0.3	0.3	0.3

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-10
SUMMARY OF METAL CONCENTRATIONS IN WILLOW

Metals	Units	Background					Affected Area				
		No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum	No. of obs.	No. of obs. <MDL	Minimum	Mean	Maximum
Aluminum	µg/g (dw)	3	0	8.3	8.9	10.1	7	0	8.2	13.4	20.5
Antimony	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Arsenic	µg/g (dw)	10	9	0.05	0.37	0.5	55	46	0.05	0.78	11
Barium	µg/g (dw)	3	0	8.2	13.9	21.5	7	0	9.8	41.2	103
Beryllium	µg/g (dw)	3	3	0.01	0.01	0.01	7	7	0.01	0.01	0.01
Boron	µg/g (dw)	3	0	5	12.3	22	7	0	5	14.3	32
Cadmium	µg/g (dw)	10	0	1.16	3.86	8.23	55	0	0.31	3.42	17.27
Calcium	µg/g (dw)	3	0	6840	10693	16300	7	0	6870	10989	20400
Chromium	µg/g (dw)	10	4	0.025	0.11	0.22	55	4	0.025	0.73	20.2
Cobalt	µg/g (dw)	3	0	0.2	0.27	0.4	7	0	0.3	0.89	1.8
Copper	µg/g (dw)	10	0	2.5	3.53	6	55	0	2.07	5.1	10.94
Iron	µg/g (dw)	3	0	45	55.3	73	7	0	48	74	141
Lead	µg/g (dw)	10	4	0.05	0.21	0.5	55	0	0.1	8.5	115
Magnesium	µg/g (dw)	3	0	2330	6537	13000	7	0	1820	3200	4730
Manganese	µg/g (dw)	3	0	63	330	804	7	0	71.8	405	908
Mercury	µg/g (dw)	10	9	0.005	0.0055	0.01	55	26	0.005	0.013	0.07
Molybdenum	µg/g (dw)	3	0	0.1	1.03	2.8	7	0	0.1	0.53	1.5
Nickel	µg/g (dw)	10	0	0.2	0.94	2.9	55	0	0.4	3.29	17.4
Phosphorus	µg/g (dw)	3	0	3430	5250	7470	7	0	3840	5646	7930
Potassium	µg/g (dw)	3	0	7070	12960	23900	7	0	5690	10824	17900
Selenium	µg/g (dw)	10	7	0.1	1	4.3	55	45	0.1	0.59	3
Silicon	µg/g (dw)	3	0	183	215	235	7	0	169	221	264
Silver	µg/g (dw)	10	8	0.005	0.008	0.03	55	14	0.005	0.041	0.22
Sodium	µg/g (dw)	3	0	2	7.7	11	7	1	0.5	11.4	30
Strontium	µg/g (dw)	3	0	19.5	39.9	70.9	7	0	27.1	49.9	86.7
Tellurium	µg/g (dw)	3	3	0.05	0.05	0.05	7	7	0.05	0.05	0.05
Thallium	µg/g (dw)	3	3	0.01	0.01	0.01	7	7	0.01	0.01	0.01
Tin	µg/g (dw)	3	3	0.05	0.05	0.05	7	5	0.05	0.11	0.3
Titanium	µg/g (dw)	3	0	1.1	1.5	2	7	0	0.7	1.03	1.3
Uranium	µg/g (dw)	3	3	0.02	0.02	0.02	7	7	0.02	0.02	0.02
Vanadium	µg/g (dw)	3	3	0.25	0.25	0.25	7	7	0.25	0.25	0.25
Zinc	µg/g (dw)	10	0	27	186	396	55	0	42.7	301	2350
Zirconium	µg/g (dw)	3	3	1.5	1.5	1.5	7	7	1.5	1.5	1.5

Note: Analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of minimum, mean and maximum.

TABLE C.2.2-11
SUMMARY OF 95 % UCL OF MEAN METAL CONCENTRATIONS IN BERRIES BY
RECEPTOR LOCATIONS

Metals	Background	Faro-M	Faro-S	Faro-N	Faro-W	Van-M	Van-S	Sheep	Overall
	N=12	N=5	N=3	N=2	N=4	N=6	N=1	N=3	N=33
	N*=15	N*=8	N*=6	N*=2	N*=4	N*=8	N*=3	N*=3	N*=44
Aluminum	1.08	1.65	1.09	2.98	0.55	1.52	2.13	0.41	1.22
Antimony	0.009	0.0084	0.0078	0.0066	0.009	0.013	0.0086	0.0065	0.0092
Arsenic *	0.026	0.041	0.052	0.0066	0.009	0.033	0.065	0.0065	0.03
Barium	1.58	1.47	1.68	1.45	1.09	4.04	1.75	0.61	1.84
Beryllium	0.0018	0.0017	0.0016	0.0013	0.0018	0.0026	0.0017	0.0013	0.0018
Boron	2.02	1.79	2.25	1.14	1.67	4.61	1.55	1.08	2.25
Cadmium *	0.012	0.021	0.022	0.0099	0.049	0.0093	0.015	0.0088	0.017
Calcium	488	176	162	168	179	667	135	109	370
Chromium *	0.017	0.039	0.048	0.044	0.032	0.034	0.036	0.056	0.029
Cobalt	0.009	0.0084	0.0078	0.0066	0.009	0.013	0.0086	0.0065	0.0092
Copper *	0.62	0.86	0.96	0.86	1.12	1.16	0.93	0.67	0.83
Iron	7.5	4.84	5.7	3.37	6.1	13.3	8.6	1.71	7.1
Lead *	0.014	0.37	0.49	0.04	0.048	0.053	0.11	0.0065	0.093
Magnesium	234	118	125	110	282	507	107	89.5	246
Manganese	16.6	10.2	7.7	18.2	20.2	10.1	8.7	5	13.5
Mercury *	0.00091	0.0013	0.0015	0.00066	0.0009	0.0016	0.0018	0.00065	0.0011
Molybdenum	0.2	0.0084	0.0078	0.01	0.13	0.2	0.0086	0.025	0.13
Nickel *	0.08	0.1	0.091	0.093	0.4	0.29	0.11	0.063	0.15
Phosphorus	990	561	565	461	1206	2104	779	387	1052
Potassium	1989	1473	1500	1125	1785	3155	1398	1404	1970
Selenium *	0.099	0.045	0.054	0.013	0.018	0.043	0.067	0.013	0.06
Silicon	58.5	32.6	28.3	25	36.7	76.9	54.9	22.2	49.5
Silver *	0.0023	0.00099	0.001	0.0024	0.005	0.0025	0.0024	0.00065	0.0021
Sodium	0.27	1.86	2.87	1.21	3.36	0.29	1.03	1.36	1.09
Strontium	1	0.44	0.46	0.32	0.41	2.79	0.22	0.26	1.03
Tellurium	0.009	0.0084	0.0078	0.0066	0.009	0.013	0.0086	0.0065	0.0092
Thallium	0.0018	0.0017	0.0016	0.0013	0.0018	0.0026	0.0017	0.0013	0.0018
Tin	0.011	0.019	0.025	0.12	0.009	0.013	0.0086	0.0065	0.018
Titanium	0.23	0.11	0.11	0.14	0.18	0.51	0.21	0.064	0.23
Uranium	0.0036	0.0034	0.0031	0.0027	0.0036	0.0052	0.0034	0.0026	0.0037
Vanadium	0.045	0.042	0.039	0.033	0.045	0.065	0.043	0.032	0.046
Zinc *	1.99	3.9	4.57	1.65	4.31	3.22	2.16	1.38	2.69
Zirconium	0.27	0.25	0.24	0.2	0.27	0.39	0.26	0.19	0.28

Notes: All concentrations are in mg/kg (fresh weight) and analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of the mean.

* denotes metals analyzed in the 2002 sampling program.

N is the number of observations for metals only measured in the 2004 sampling program and N* is the number of observations for metals measured in both 2002 and 2004 sampling programs.

TABLE C.2.2-12
SUMMARY OF METAL CONCENTRATIONS IN BROWSE BY RECEPTOR
LOCATIONS

Metals	Background	Faro-M	Faro-S	Faro-N	Faro-W	Van-M	Van-S	Sheep	Overall
	N=4	N=2	N=0	N=0	N=2	N=0	N=0	N=2	N=10
	N*=11	N*=37	N*=24	N*=1	N*=3	N*=4	N*=3	N*=3	N*=65
Aluminum	3.66	6.1			6			3.86	4.65
Antimony	0.019	0.019			0.02			0.02	0.019
Arsenic *	0.13	0.38	0.49	0.19	0.078	0.19	0.19	0.078	0.28
Barium	12	21.6			5.2			12.7	12.7
Beryllium	0.0038	0.0037			0.004			0.0041	0.0039
Boron	6.3	5.5			4.29			3.46	5.1
Cadmium *	1.46	1.34	1.38	0.28	1.08	1.9	0.94	0.57	1.36
Calcium	4905	3915			3673			3561	4192
Chromium *	0.69	0.17	0.12	0.043	0.047	0.16	0.13	0.041	0.24
Cobalt	0.13	0.28			0.33			0.5	0.27
Copper *	1.48	2.06	2.16	1.76	1.75	1.84	1.46	1.93	1.89
Iron	28.3	23.5			21.1			29.8	26.2
Lead *	0.077	4.53	6.7	5.5	0.26	0.62	0.66	0.12	2.82
Magnesium	2298	1322			862			1277	1611
Manganese	114	190			92.9			266	155
Mercury *	0.0021	0.006	0.0077	0.0019	0.0039	0.0039	0.0026	0.002	0.0046
Molybdenum	0.39	0.13			0.04			0.26	0.24
Nickel *	0.65	1.2	1.26	0.23	0.95	1.31	1.19	0.7	1.13
Phosphorus	2056	2374			1626			2457	2114
Potassium	4627	5384			4464			2609	4342
Selenium *	0.33	0.25	0.25	0.19	0.092	0.24	0.26	0.16	0.25
Silicon	85.6	79.4			90.4			83.7	84.9
Silver *	0.0032	0.019	0.024	0.0039	0.0083	0.019	0.018	0.0078	0.014
Sodium	3.27	1.89			5.7			5.1	3.85
Strontium	19.5	20.2			11.2			20.3	18.1
Tellurium	0.019	0.019			0.02			0.02	0.019
Thallium	0.0038	0.0037			0.004			0.0041	0.0039
Tin	0.041	0.048			0.02			0.02	0.034
Titanium	0.54	0.41			0.39			0.37	0.45
Uranium	0.0076	0.0075			0.008			0.0082	0.0078
Vanadium	0.095	0.093			0.1			0.1	0.097
Zinc *	74.5	138	177	73.5	83.1	63.6	32.7	65.7	110
Zirconium	0.57	0.56			0.6			0.61	0.58

Notes: All concentrations are in mg/kg (fresh weight) and analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of the mean.

* denotes metals analyzed in the 2002 sampling program.

N is the number of observations for metals only measured in the 2004 sampling program and N* is the number of observations for metals measured in both 2002 and 2004 sampling programs.

TABLE C.2.2-13
SUMMARY OF METAL CONCENTRATIONS IN FORAGE BY RECEPTOR
LOCATIONS

Metals	Background	Faro-M	Faro-S	Faro-N	Faro-W	Van-M	Van-S	Sheep	Overall
	N=10	N=8	N=6	N=5	N=5	N=2	N=1	N=9	N=45
	N*=10	N*=23	N*=16	N*=5	N*=6	N*=8	N*=7	N*=12	N*=71
Aluminum	4.15	5.2	6	6.2	3.78	11.4	9.8	5.6	4.89
Antimony	0.015	0.015	0.015	0.018	0.012	0.024	0.023	0.016	0.016
Arsenic *	0.028	0.18	0.2	0.021	0.048	0.14	0.15	0.056	0.097
Barium	17.9	20.2	17.1	16.8	25.7	35.2	21.5	21.1	20.2
Beryllium	0.003	0.0029	0.0029	0.0082	0.0024	0.0049	0.0046	0.0091	0.0048
Boron	5	5.5	6.6	5.2	3.86	13.1	10.1	4.33	5.2
Cadmium *	0.072	0.059	0.067	0.08	0.083	0.036	0.04	0.022	0.058
Calcium	3319	4895	5777	4007	5017	2985	2285	3337	4001
Chromium *	0.078	0.13	0.12	0.11	0.081	0.12	0.13	0.074	0.1
Cobalt	0.033	0.06	0.07	0.026	0.29	0.024	0.023	0.083	0.076
Copper *	1.4	1.31	1.46	1.64	1.45	1.29	1.21	1.6	1.41
Iron	17.7	23.2	25.9	19.4	18.8	36.9	28.3	27.5	22.1
Lead *	0.025	4.71	6.6	0.17	0.33	0.69	0.77	0.086	1.7
Magnesium	1114	1130	1166	909	1479	801	631	908	1053
Manganese	110	125	63.9	124	163	141	195	107	123
Mercury *	0.0015	0.0074	0.0081	0.0023	0.0028	0.0046	0.0049	0.0027	0.0042
Molybdenum	1.57	0.22	0.11	0.19	0.37	0.17	0.023	0.25	0.52
Nickel *	0.19	0.43	0.42	0.38	1.12	0.49	0.53	0.52	0.46
Phosphorus	2038	1357	1336	1704	1852	2143	2088	1443	1686
Potassium	5779	6286	6911	5368	7027	2728	2445	6001	6043
Selenium *	0.34	0.15	0.13	0.053	0.049	0.19	0.21	0.083	0.14
Silicon	270	329	330	442	263	187	135	281	305
Silver *	0.0032	0.008	0.011	0.0077	0.022	0.0088	0.0097	0.003	0.0075
Sodium	5.6	4.97	6	3.56	7.2	0.24	0.23	10.8	6.1
Strontium	10.2	16.6	19.1	14.7	22.8	4.4	2.43	17.3	15.4
Tellurium	0.015	0.015	0.015	0.018	0.012	0.024	0.023	0.016	0.016
Thallium	0.003	0.017	0.017	0.0037	0.0024	0.0049	0.0046	0.0092	0.0072
Tin	0.063	0.02	0.018	0.045	0.051	0.024	0.023	0.044	0.041
Titanium	0.54	0.26	0.28	0.34	0.41	0.79	0.69	0.25	0.38
Uranium	0.006	0.0059	0.0059	0.0074	0.0048	0.0098	0.0091	0.0066	0.0063
Vanadium	0.076	0.074	0.073	0.092	0.06	0.12	0.11	0.082	0.079
Zinc *	11.7	33.7	41.5	19.2	16.3	54.3	60	10.2	25
Zirconium	0.45	0.44	0.44	0.55	0.36	0.73	0.69	0.49	0.48

Notes: All concentrations are in mg/kg (fresh weight) and analytical results reported as less than method detection limit (MDL) were assumed to be equal to ½ of method detection limit in the calculation of the mean.

* denotes metals analyzed in the 2002 sampling program.

N is the number of observations for metals only measured in the 2004 sampling program and N* is the number of observations for metals measured in both 2002 and 2004 sampling programs.

C.2.3 MEASURED MOOSE AND CARIBOU CONCENTRATIONS

Moose and caribou concentrations were collected in 2004 and measured data were provided by Gartner Lee Limited. Data for a total of three moose and four caribous from the Anvil Range Mine site are summarized in Table C.2.3-1. The data summary statistics are provided in Table C.2.3-2.

Measured data were also available for beaver, marmot, and ruffed grouse which were provided by Gartner Lee Limited. However, only measured concentrations in moose and caribou were used in the risk assessment. The other smaller mammalian species were evaluated at different locations across the site; therefore, transfer factors were used to predict flesh concentrations. A comparison between the measured and predicted game concentrations for beaver, marmot and ruffed grouse is provided in Table C.2.3-3.

TABLE C.2.3-1
SUMMARY OF METAL CONCENTRATIONS IN MOOSE AND CARIBOU

									mg/kg (dw)									
Site_ID	Sample_ID	Specimen_ID	Matrix	Species	Sex	Age	Year	% Moisture	Arsenic	Cadmium	Copper	Lead	Manganese	Nickel	Silver	Thallium	Tin	Zinc
G19	23127_Caribou_Kidney	23127	kidney	caribou	M	1	2004	78.7	0.04	15.5	24.2	3.22	6.59	0.10	0.095	0.10	<0.01	83.4
I16	22713_Caribou_Kidney	22713	kidney	caribou	M	2	2004	77.5	0.05	5.20	19.2	2.82	6.59	0.09	0.044	0.09	<0.01	79.3
Q37	23238_Caribou_Kidney	23238	kidney	caribou	M	5	2004	79.4	0.05	46.1	24.9	2.18	8.67	0.22	0.205	0.07	<0.01	131
U36	04-503_Caribou_Kidney	04-503	kidney	caribou	M	4	2004	76.2	0.06	84.0	22.2	1.75	8.57	0.10	0.041	0.09	<0.01	101
G19	23127_Liver	23127	liver	caribou	M	1	2004	67.8	<0.01	2.55	23.1	1.82	13.0	0.09	0.935	<0.01	<0.01	56.4
I16	22713_Liver	22713	liver	caribou	M	2	2004	67.7	0.03	0.92	59.5	2.38	13.5	0.09	2.21	<0.01	<0.01	59.6
Q37	23238_Liver	23238	liver	caribou	M	5	2004	68.6	0.02	3.33	70.2	1.44	14.6	0.16	3.21	<0.01	<0.01	70.8
U36	04-503_Liver	04-503	liver	caribou	M	4	2004	67.7	<0.01	6.58	27.1	1.01	9.12	0.07	2.35	<0.01	<0.01	41.8
G19	23127_Muscle	23127	muscle	caribou	M	1	2004	69.9	<0.01	<0.01	7.35	0.03	0.56	<0.05	0.149	<0.01	<0.01	245
I16	22713_Muscle	22713	muscle	caribou	M	2	2004	72.2	<0.01	<0.01	8.74	0.06	0.77	<0.05	0.108	<0.01	<0.01	153
Q37	23238_Muscle	23238	muscle	caribou	M	5	2004	72.7	0.04	0.03	9.18	0.10	0.77	<0.05	0.037	<0.01	<0.01	215
U36	04-503_Muscle	04-503	muscle	caribou	M	4	2004	69.4	0.02	0.02	8.08	0.03	2.79	0.05	0.025	<0.01	0.02	138
F29	22714_Moose_Kidney	22714	kidney	moose	M	6	2004	79.2	0.03	182	13.4	0.04	3.86	0.25	0.120	<0.01	<0.01	122
K23	22691_Moose_Kidney	22691	kidney	moose	M	4	2004	77.5	<0.01	148	16.5	0.13	12.2	0.88	0.068	0.01	<0.01	128
U30	22711_Moose_Kidney	22711	kidney	moose	M	U	2004	77.4	0.01	166	11.8	0.08	4.78	0.23	0.080	0.01	<0.01	107
F29	22714_Liver	22714	liver	moose	M	6	2004	50.7	<0.01	10.3	41.1	0.02	2.93	0.06	0.051	<0.01	<0.01	48.5
K23	22691_Liver	22691	liver	moose	M	4	2004	70.8	<0.01	16.3	66.2	0.09	7.74	0.12	0.270	<0.01	<0.01	49.3
L22	22704_Liver	22704	liver	moose	M	2	2004	57.7	<0.01	4.60	47.7	0.07	3.98	0.09	0.128	<0.01	0.02	22.1
F29	22714_Muscle	22714	muscle	moose	M	6	2004	74.7	<0.01	0.08	5.02	<0.01	0.45	<0.05	0.073	<0.01	<0.01	236
K23	22691_Muscle	22691	muscle	moose	M	4	2004	72.8	<0.01	0.06	3.80	0.02	0.44	<0.05	0.393	<0.01	<0.01	222
L22	22704_Muscle	22704	muscle	moose	M	2	2004	69.0	<0.01	0.02	3.72	0.05	0.80	<0.05	0.090	<0.01	<0.01	257

TABLE C.2.3-2
SUMMARY STATISTICS FOR METAL CONCENTRATIONS MEASURED IN MOOSE AND CARIBOU

	Tissue	N	Units	Arsenic		Cadmium		Copper		Lead		Manganese	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Caribou	Kidney	4	mg/g dry wt	0.04	0.06	5.2	84	19.2	24.9	1.75	3.22	6.59	8.67
	Liver	4	mg/g dry wt	<0.01	0.03	0.92	6.58	23.1	70.2	1.01	2.38	9.115	14.6
	Muscle	4	mg/g dry wt	<0.01	0.04	<0.01	0.03	7.35	9.18	0.025	0.1	0.56	2.785
Moose	Kidney	3	mg/g dry wt	<0.01	0.03	148	182	11.8	16.5	0.04	0.13	3.86	12.2
	Liver	3	mg/g dry wt	<0.01	<0.01	4.6	16.3	41.1	66.2	0.02	0.09	2.93	7.74
	Muscle	3	mg/g dry wt	<0.01	<0.01	0.02	0.08	3.72	5.02	<0.01	0.05	0.44	0.8
	Tissue	N	Units	Nickel		Silver		Thallium		Tin		Zinc	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Caribou	Kidney	4	mg/g dry wt	0.09	0.22	0.041	0.205	0.07	0.1	<0.01	<0.01	79.3	131
	Liver	4	mg/g dry wt	0.065	0.16	0.935	3.21	<0.01	<0.01	<0.01	<0.01	41.8	70.8
	Muscle	4	mg/g dry wt	<0.05	0.05	0.0245	0.149	<0.01	<0.01	<0.01	0.02	137.5	245
Moose	Kidney	3	mg/g dry wt	0.23	0.88	0.068	0.12	<0.01	0.01	<0.01	<0.01	106.5	128
	Liver	3	mg/g dry wt	0.06	0.12	0.051	0.27	<0.01	<0.01	<0.01	0.02	22.1	49.3
	Muscle	3	mg/g dry wt	<0.05	<0.05	0.073	0.393	<0.01	<0.01	<0.01	<0.01	222	257

Note: N = number of samples

TABLE C.2.3-3
COMPARISON BETWEEN MEASURED AND PREDICTED GAME CONCENTRATIONS

	Tissue	N	Units	Arsenic		Cadmium		Copper		Lead		Manganese	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Beaver	Kidney	3	mg/g dry wt	0.2	0.6	217	276	15.5	16.7	1.6	4.6	11.3	27.5
	Liver	3	mg/g dry wt	0.1	0.5	15.8	31.7	8.2	10.9	3.5	6.2	24.3	44.9
	Muscle	3	mg/g dry wt	0.2	1.2	0.26	0.47	3.1	4.7	<0.1	<0.1	0.5	2.3
	Predicted*		mg/g dry wt	0.0014	0.013	0.0098	0.044	0.085	0.26	0.053	0.26	0.36	1.94
Marmot	Kidney	1	mg/g dry wt	0.2	0.2	4.58	4.58	14.1	14.1	2.5	2.5	6.2	6.2
	Liver	1	mg/g dry wt	0.3	0.3	1.7	1.7	17.2	17.2	2.6	2.6	13.6	13.6
	Muscle	1	mg/g dry wt	<0.1	<0.1	0.14	0.14	5.8	5.8	0.3	0.3	0.8	0.8
	Predicted*		mg/g dry wt	0.0005	0.0041	0.0002	0.0004	0.073	0.11	0.086	17.5	0.30	0.81
Ruffed Grouse	Kidney	2	mg/g dry wt	<0.3	0.3	58.8	142	15.3	20	<0.3	0.3	9.9	11
	Liver	2	mg/g dry wt	0.1	0.2	5.79	6.27	8.5	12.7	<0.1	0.2	6.3	10.6
	Muscle	2	mg/g dry wt	<0.1	0.1	0.11	0.16	2.1	2.9	<0.1	<0.1	0.5	0.7
	Predicted*		mg/g dry wt	0.11	0.58	0.14	0.92	0.54	1.11	0.032	4.65	2.27	10.2
	Tissue	N	Units	Nickel		Silver		Thallium		Tin		Zinc	
				Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Beaver	Kidney	3	mg/g dry wt	0.2	0.3	<0.01	<0.01	<0.02	<0.02	<0.1	<0.1	192	247
	Liver	3	mg/g dry wt	<0.1	0.2	<0.01	0.01	<0.02	<0.02	<0.1	<0.1	115	161
	Muscle	3	mg/g dry wt	<0.1	<0.1	<0.01	<0.01	<0.02	<0.02	<0.1	<0.1	64.9	157
	Predicted*		mg/g dry wt	0.023	0.073	0.0008	0.0061	0.0003	0.0004	0.0068	0.017	27	83
Marmot	Kidney	1	mg/g dry wt	0.2	0.2	<0.02	<0.02	<0.04	<0.04	<0.2	<0.2	76.7	76.7
	Liver	1	mg/g dry wt	<0.1	<0.1	<0.01	<0.01	<0.02	<0.02	<0.1	<0.1	128	128
	Muscle	1	mg/g dry wt	<0.1	<0.1	<0.01	<0.01	<0.02	<0.02	<0.1	<0.1	152	152
	Predicted*		mg/g dry wt	0.0084	0.065	0.0002	0.0008	0.0004	0.0052	0.0066	0.016	7.6	64
Ruffed Grouse	Kidney	2	mg/g dry wt	<0.3	<0.2	<0.03	<0.02	<0.06	<0.04	<0.3	<0.2	118	137
	Liver	2	mg/g dry wt	<0.1	<0.1	<0.01	<0.01	<0.02	<0.02	<0.1	<0.1	57.1	104
	Muscle	2	mg/g dry wt	<0.1	<0.1	<0.01	<0.01	<0.02	<0.02	<0.1	<0.1	18.2	19
	Predicted*		mg/g dry wt	0.55	4.07	0.024	0.075	0.035	0.046	0.75	2.25	256	951

Note: N = number of samples

*Predicted flesh concentrations are based on Existing Scenario. All predicted concentrations have been converted from wet weight to dry weight basis

C.3 References

- Canadian Council of Ministers of the Environment (CCME) 2003. *Canadian Environmental Quality Guidelines – Canadian Water Quality Guidelines for the Protection of Aquatic Life*. Pub No. 1299.
- Gartner Lee Limited 2005a. *Spreadsheets on Water Quality for the Anvil MineComplex*. Provided by L. Comm.
- Gartner Lee Limited 2005b. *Anvil Range Mine Complex – Terrestrial Effects Study: Investigation into Metal Concentrations in Vegetation, Wildlife and Soils*. Prepared for Deloitte & Touche Inc. Draft for Discussion. April.
- Gartner Lee Limited 2002. *Anvil Range Mine Complex: 2002 Baseline Environmental Information*. Volume 2 of 2. Project Description. May 2002.
- Laberge Environmental Services 2004. *Biological and Sediment Monitoring Program at Rose and Anvil Creeks, Faro, Y.T. 2004*. December.
- White Mountain Environmental Consulting 2004. *Aquatic Life Sampling and Testing Program for the Anvil Range Mine Site, Rose and Vangorda Creek Watersheds, Faro, Yukon*. Prepared for Deloitte and Touche Inc. October.
- White Mountain Environmental Consulting 2005. *Pelly River Aquatic Effects Assessment – 2004 Draft*. February.

APPENDIX D

ECOLOGICAL CHARACTERISTICS OF TERRESTRIAL ECOLOGICAL RECEPTORS

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APPENDIX D: ECOLOGICAL CHARACTERISTICS OF TERRESTRIAL ECOLOGICAL RECEPTORS

D.1 GENERAL OVERVIEW

This appendix presents the summary table of ecological characteristics of the terrestrial ecological receptors considered in this assessment. The ecological receptors considered in this assessment included the following: woodland caribou, snowshoe hare, moose, fanning sheep, grouse, ducks (mallard, merganser, scaup), hoary marmot, black bear, wolf, mink, beaver, and fox. Information on water and food ingestion rates were obtained from literature sources, as is the typical approach for ecological risk assessments. The soil and sediment ingestion rates were obtained from Beyer *et al.* (1994). The dietary characteristics and time spent in the study area are entered into the pathways model so that estimates of exposure can be obtained.

**TABLE D-1
WOODLAND CARIBOU RECEPTOR CHARACTERISTICS**

Parameter Description	Units	Default Value	Reference
water ingestion rate	g/d	9500	based on Kirk (1977) and Wales <i>et al.</i> (1975)
food ingestion rate	g(wet wt.)/d	8000	calculated from U.S. EPA 1993
fraction of food that is forage ^a	-	0.01	based on Thomas and Barry 1991
fraction of food that is browse ^a	-	0.05	based on Thomas and Barry 1991
fraction of food that is lichen ^a	-	0.91	based on Thomas and Barry 1991
soil ingestion rate	g(dry wt.)/d	240	calculated from Beyer <i>et al.</i> 1994
body weight	kg	105	Schmidt 1978
fraction of time in study area	-	0.5	assumed

Note:

a) Browse comprises shrubs and conifers and make up 5% of the diet; forage is approximately 1% of the diet and the remainder of the food is assumed to be lichen at 91% and soil at 3%.

**TABLE D-2
SNOWSHOE HARE RECEPTOR CHARACTERISTICS**

Parameter Description	Units	Default Value	Reference
water ingestion rate ^a	g/d	130	calculated from U.S. EPA 1993
food ingestion rate ^b	g(wet wt.)/d	300	Pease <i>et al.</i> 1979
fraction of food that is forage ^c	-	0.38	U.S. EPA 1993
fraction of food that is browse ^c	-	0.6	U.S. EPA 1993
soil ingestion rate	g(dry wt.)/d	5.7	calculated from Beyer <i>et al.</i> 1994
body weight	kg	1.4	U.S. EPA 1993
fraction of time in study area	-	1	assumed

Notes:

- a) Based on allometric equation for water intake from U.S. EPA (1993) and using the body weight of a hare of 1.4 kg and water intake of Eastern Cottontail Rabbit from U.S. EPA (1993).
- b) This value is consistent with the value obtained for an allometric equation for herbivores given in U.S. EPA (1993).
- c) Based on the dietary composition of Eastern Cottontail Rabbit from U.S. EPA (1993).

**TABLE D-3
MOOSE RECEPTOR CHARACTERISTICS**

Parameter Description	Units	Default Value	Reference
water ingestion rate ^a	g/d	31,300	calculated from U.S. EPA 1993
food ingestion rate ^b	g(wet wt.)/d	23,000	Canadian Wildlife Service 1997
fraction of food that is browse	-	0.9	Belovsky <i>et al.</i> 1973
fraction of food that is aquatic vegetation	-	0.09	Belovsky <i>et al.</i> 1973
sediment ingestion rate	g(dry wt.)/d	138	calculated from Beyer <i>et al.</i> 1994
body weight	kg	600	Canadian Wildlife Service 1997
fraction of time in study area	-	1	assumed

Notes:

- a) Based on the allometric equation provided in U.S. EPA 1993 and a body weight of 600 kg for moose (CWS 1997).
b) The Canadian Wildlife Service (CWS) report that moose eat 15 – 20 kg/d twigs and shrubs in the winter and 20 – 30 kg/d forage consisting of twigs, leaves, shrubs, upland and water plants in the summer.

**TABLE D-4
FANNIN SHEEP RECEPTOR CHARACTERISTICS**

Parameter Description	Units	Default Value	Reference
water ingestion rate	g/d	4500	calculated from U.S. EPA 1993
food ingestion rate	g(wet wt.)/d	7530	calculated from U.S. EPA 1993
fraction of food that is forage	-	0.98	assumed from Canadian Wildlife Service 1997
soil ingestion rate	g(dry wt.)/d	113	calculated from Beyer <i>et al.</i> 1994
body weight	kg	70	Canadian Wildlife Service 1997
fraction of time in study area	-	1	assumed

**TABLE D-5
GROUSE RECEPTOR CHARACTERISTICS**

Parameter Description	Units	Default Value	Reference
water ingestion rate ^a	g/d	358	calculated from U.S. EPA 1993
food ingestion rate ^b	g(wet wt.)/d	119	calculated from U.S. EPA 1993
fraction of food that is browse ^c	-	0.83	U.S. EPA 1993
fraction of food that is berries ^c	-	0.15	U.S. EPA 1993
soil ingestion rate	g(dry wt.)/d	1.8	calculated from Beyer <i>et al.</i> 1994
body weight	kg	0.475	Canadian Wildlife Service 1997
fraction of time in study area	-	1	assumed

Notes:

- a) Based on allometric equation provided in U.S. EPA (1993).
b) Based on the allometric equation provided in U.S. EPA (1993) and a body weight of 475 g for a grouse (Newfoundland Government 2001).
c) Based on breakdown of food intake by a quail in U.S. EPA (1993).

**TABLE D-6
DUCK RECEPTOR CHARACTERISTICS**

Parameter Description	Units	Default Value	Reference
food ingestion rate ^a mallard common merganser scaup	g(wet wt.)/d	250 370 255	CCME 1999 CCME 1999 CCME 1999
fraction of time spent in study area ^b mallard common merganser scaup	-	0.50	U.S. EPA 1993
fraction of food that is fish mallard common merganser scaup	-	0.0 0.996 0.0	U.S. EPA 1993 Andress and Parker 1995 U.S. EPA 1993
fraction of food that is benthic invertebrates mallard common merganser scaup	-	0.74 0.0 0.89	U.S. EPA 1993 U.S. EPA 1993 U.S. EPA 1993
fraction of food that is aquatic vegetation mallard common merganser scaup	-	0.25 0.0 0.09	U.S. EPA 1993 U.S. EPA 1993
Sediment ingestion rate mallard common merganser scaup	g(dry wt.)/d	1.7 1.5 5.6	Calculated from Beyer <i>et al.</i> 1994
water ingestion rate ^c mallard common merganser scaup	g/d	62 76 52	Calculated from U.S. EPA 1993
Body weight mallard common merganser scaup	kg	1.08 1.47 0.82	U.S. EPA 1993 U.S. EPA 1993 U.S. EPA 1993

Notes:

a) Taken from CCME (1999) along with body weights of 1082g for a mallard, 820g for a scaup and 1470g for common merganser.

b) Based on information that scaup and mallards migrate and spend 4 – 8 months away from this area.

c) Based on the allometric equation published in U.S. EPA (1993).

TABLE D-7
HOARY MARMOT RECEPTOR CHARACTERISTICS

Parameter Description	Units	Default Value	Reference
water ingestion rate	g/d	380	U.S. EPA 1993
food ingestion rate	g(wet wt.)/d	790	U.S. EPA 1993
fraction of food that is forage	-	0.99	Curby 1994
soil ingestion rate	g(dry wt.)/d	8.2	calculated from Beyer <i>et al.</i> 1994
body weight	kg	4.5	Curby 1994
fraction of time in study area	-	1	assumed

TABLE D-8
BLACK BEAR RECEPTOR CHARACTERISTICS

Parameter Description	Units	Default Value	Reference
water ingestion rate ^a	g/d	9,500	U.S. EPA 1993
food ingestion rate ^a	g(wet wt.)/d	14,900	U.S. EPA 1993
fraction of food that is berries	-	0.4	Holcroft and Herrero 1991
fraction of food that is forage	-	0.33	Holcroft and Herrero 1991
fraction of food that is fish	-	0.15	Canadian Wildlife Service 1993
fraction of food that is moose	-	0.05	Canadian Wildlife Service 1993
fraction of food that is caribou	-	0.05	Canadian Wildlife Service 1993
soil ingestion rate	g(dry wt.)/d	393	Calculated from Beyer <i>et al.</i> 1994
body weight	kg	225	Kronk 2002
fraction of time in study area	-	1	assumed

Notes:

a) Based on the allometric equation provided in U.S. EPA (1993) and a body weight of 225 kg for a black bear.

TABLE D-9
WOLF RECEPTOR CHARACTERISTICS

Parameter Description	Units	Default Value	Reference
water ingestion rate ^a	g/d	2,920	U.S. EPA 1993
food ingestion rate ^b	g(wet wt.)/d	5,500	Fuller and Keith 1980
fraction of food that is hare ^c	-	0.19	U.S. EPA 1993
fraction of food that is moose ^c	-	0.40	U.S. EPA 1993
fraction of food that is caribou ^c	-	0.40	U.S. EPA 1993
soil ingestion rate	g(dry wt.)/d	46.2	calculated from Beyer <i>et al.</i> 1994
body weight	kg	43	Schmidt and Gilbert 1978
fraction of time in study area	-	0.25	Assumed

Notes:

a) Based on the allometric equation provided in U.S. EPA (1993) and a body weight of 43 kg for a gray wolf (Schmidt and Gilbert 1978).

b) Based on study of Fuller and Keith (1980) which estimate that gray wolf in northeastern Alberta eat 5.5 kg/d.

c) Based on the intake of foxes from U.S. EPA (1993) and wolves from the Canadian Wildlife Service (1993b).

TABLE D-10
MINK RECEPTOR CHARACTERISTICS

Parameter Description	Units	Default Value	Reference
water ingestion rate ^a	g/d	99	
food ingestion rate ^b	g(wet wt.)/d	220	U.S. EPA 1993
fraction of food that is aquatic vegetation	-	0.05	U.S. EPA 1993
fraction of food that is fish	-	0.65	U.S. EPA 1993
fraction of food that is benthic	-	0.09	U.S. EPA 1993
fraction of food that is ducks	-	0.05	U.S. EPA 1993
fraction of food that is hare	-	0.05	U.S. EPA 1993
sediment ingestion rate	g(dry wt.)/d	2.2	calculated from Beyer <i>et al.</i> 1994
body weight	kg	1.0	U.S. EPA 1993
fraction of time in study area	-	1	assumed

Notes:

a) Based on the water intake of a mink provided in U.S. EPA (1993).

b) Based on the food intake information and a body weight of 1kg for a mink provided in U.S. EPA (1993).

TABLE D-11
BEAVER RECEPTOR CHARACTERISTICS

Parameter Description	Units	Default Value	Reference
water ingestion rate	g/d	1730	Beak 1995
food ingestion rate	g(wet wt.)/d	1000	Beak 1995
fraction of food that is aquatic vegetation	-	0.5	Mirka <i>et al.</i> 1996
fraction of food that is browse	-	0.49	Mirka <i>et al.</i> 1996
sediment ingestion rate	g(dry wt.)/d	10	calculated from Beyer <i>et al.</i> 1994
body weight	kg	24	Anderson 2002
fraction of time in study area	-	1	assumed

TABLE D-12
FOX RECEPTOR CHARACTERISTICS

Parameter Description	Units	Default Value	Reference
water ingestion rate ^a	g/d	383	U.S. EPA 1993
food ingestion rate ^a	g(wet wt.)/d	311	U.S. EPA 1993
fraction of food that is berries	-	0.14	U.S. EPA 1993
fraction of food that is duck	-	0.42	U.S. EPA 1993
fraction of food that is hare	-	0.43	U.S. EPA 1993
soil ingestion rate	g(dry wt.)/d	2.6	calculated from Beyer <i>et al.</i> 1994
body weight	kg	4.5	U.S. EPA 1993
fraction of time in study area	-	1	assumed

Notes:

a) Based on allometric equation provided in U.S. EPA (1993) and the body weight of a fox.

D.2 REFERENCES

- Anderson, R. 2002. Castor Canadensis (on-line). Animal Diversity Web. http://animaldiversity.umm2.edu/site/accounts/information/castor_canadensis.html.
- Andress, S. and G.H. Parker 1995. Radium-226 Levels in Eggs and Body Tissues of Herring Gulls and Common Mergansers Nesting Near the Elliot Lake Uranium Mine Tailings. Presentation at the Environmental Assessment Panel Reviewing Decommissioning Proposals for Elliot Lake Uranium Mine Tailings Management Areas (TMAs). Transcript of Proceedings. 16 November. Volume 3.
- Belovsky, G.E., P.A. Jordan, and D.B. Botkin. 1973. Summer Browsing by Moose in Relation to Preference, and Animal Density: A New Quantitative Approach. Proceedings of the 9th North American Moose Conference and Workshop, Quebec, City, March.
- Beak Consultants Ltd. 1995. Site-Specific Environmental Assessment. Supporting Document No. 2 for the Cigar Lake Project E.I.S. Prepared for the Cigar Lake Mining Corporation.
- Beyer, W.N., E. Conner and S. Gerould *et al.* 1994. *Survey of Soil Ingestion by Wildlife*. Journal of Wildlife Management 58: 375-382.
- Canadian Wildlife Service (CWS). 1997. *Hinterland Who's Who: Moose On-Line Report*. Environment Canada. <http://www.cws-scf.ec.gc.ca/>. Accessed on June 10, 2003.
- Canadian Wildlife Service (CWS) 1993. *Hinterland Who's Who: Black Bear On-Line Report*. Environment Canada. <http://www.ffdp.ca/hwww.asp?id=1&pid=0>. Accessed in 2006.
- Canadian Council of Ministers of the Environment (CCME) 1999. *Canadian Environmental Quality Guidelines*. Pub No. 1299.
- Curby C. 1994. Marmot (on-line). Alaska Department of Fish & Game. <http://www.adfg.state.ak.us/pubs/notebook/furbear/marmot.php>.
- Fuller, T.K. and L.B. Keith 1980. *Wolf Population Dynamics and Prey Relationships in Northeastern Alberta*. J. Wildl. Mange. 44:583-602.
- Holcroft, A.C. and S. Herrero 1991. *Black Bear, Ursus americanus, Food Habits in Southwestern Alberta*. An. Field-Nat. 105:335-345.
- Kirk, R.W. (ed.) 1977. *Current Veterinary Therapy*. W.B. Saunders Co., Toronto, pp 1418.
- Kronck, C. 2002. Ursusamericanus (on-line). Animal Diversity Web. http://animaldiversity.ummz.edu/site/accounts/information/Ursus_americanus.html.

- Mirka, M.A., F.V. Clulow, N.K. Davé and T.P. Lim 1996. Radium-226 in Cattails, *Typha latifolia* and Bone of Muskrat, *Ondatra zibethica*, from a Watershed with Uranium Tailings Near the City of Elliot Lake, Canada. *Env. Pol.* 91: 41 – 51.
- Pease, J.L., R.H. Vowles and L.B. Keith 1979. *Interaction of Snowshoe Hares and Woody Vegetation*. *J. Wildl. Manage.* 43:43-60.
- Schmidt, J.L. and D.L. Gilbert 1978. *Big Game of North America, Ecology and Management*. Stackpole Books, Harrisburg, PA 17105.
- Thomas, D.C. and S.J. Barry. 1991. *Microhistological Analyses of Caribou Diet: Fecal Versus Rumen Samples and Other Variables*. Pages 516-529 in *Proc. Fourth North Amer. Caribou Workshop*. C.E. Buttler and S.P. Mahoney (eds). Newf.-Lab. Wildl. Div., St. John's, Newfoundland.
- United States Environmental Protection Agency (U.S. EPA) 1993. *Wildlife Exposure Factors Handbook*. EPA/600/R-93/187).
- Wales, R.A., L.P. Milligan and E.H. McEwan. 1975. *Urea Recycling in Caribou, Cattle and Sheep*. In *First Int. Reindeer and Caribou Sympo.* J.R. Luick, P.C. Lent, D.R. Klein and R.G. White (eds), Univ. Alaska, Fairbanks, pp. 297-307.

APPENDIX E

PATHWAYS MODEL INFORMATION APPLIED IN ANVIL RANGE MINE ASSESSMENT

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APPENDIX E: PATHWAYS MODEL INFORMATION APPLIED IN ANVIL RANGE MINE ASSESSMENT

E.1 GENERAL OVERVIEW

Pathways equations can be used to predict concentrations of contaminants of potential concern (COPC) in air, water, sediment and soil as well as uptake by aquatic and terrestrial biota. The equations can also be used to estimate dose to humans resulting from exposure to contaminants via several potential pathways, specifically ingestion and dermal contact.

For the Anvil Range Mine study, the calculations were conducted deterministically.

E.2 PREDICTED CONCENTRATIONS FOR USE IN EXPOSURE CALCULATIONS FOR RISK ASSESSMENT

This section presents the equations for deriving environmental concentrations in media and ecological receptors. Contaminant concentrations in water, soil, lichen, berries, browse, and forage as well as caribou and moose concentrations were assumed to be equal to measured concentrations from the site.

E.2.1 Sediment Concentrations

Contaminant concentrations in sediment were calculated using equation (E.2-1):

$$C_{sed} = C_{water} \times K_d \quad (E.2-1)$$

where:

- C_{sed} = concentration of contaminant in sediment [mg/kg (dw)];
- C_{water} = water concentration [mg/L];
- K_d = water-to-sediment distribution coefficient [(mg/kg (dw))/(mg/L)]
{Table E.2-1}.

The water-to-sediment distribution coefficients from literature used for this assessment are summarized in Table E.2.1-1.

TABLE E.2.1-1
WATER-TO-SEDIMENT DISTRIBUTION COEFFICIENT USED IN THE
ASSESSMENT

COPC	Distribution Coefficients, K_d L/kg (ww)	Reference
Arsenic	9100	Site Specific
Cadmium	3750	Site Specific
Copper	50000	Site Specific
Lead	30000	Site Specific
Manganese	18000	Site Specific
Nickel	17000	Site Specific
Silver	880	Site Specific
Thallium	1500	Baes <i>et al.</i> 1984
Tin	13000	U.S. NRC 1992
Zinc	7900	Site Specific

E.2.2 Aquatic Biota Equations

Predicting the uptake of COPC by aquatic biota can be quite involved and requires consideration of several interactions; for example, direct uptake from water by aquatic vegetation, sedimentation and deposition of aquatic vegetation to lake sediment, decomposition and release of contaminants from lake sediments to the water phase, harvesting of aquatic vegetation by invertebrates, predation of large fish on small fish, etc. The bioaccumulation factors used in the aquatic biota equations are an aggregate representation of numerous pathways and mechanisms of metal transfer through the aquatic environment.

E.2.2.1 Fish

Contaminant concentrations in fish were assumed to equal measured concentrations from the site, when available. In the absence of measured site data for fish, contaminant concentrations were calculated using the following equation:

$$C_{fish} = C_{water} \times TF_{water-to-fish} \quad (E.2-2)$$

where:

- C_{fish} = concentration of contaminant in fish [mg/kg (ww)];
- C_{water} = water concentration [mg/L];
- $TF_{water-to-fish}$ = water-to-fish transfer factor [(mg/kg (ww))/(mg/L)].

The water-to-fish transfer factors from literature used for this assessment are summarized in Table E.2.2-1.

**TABLE E.2.2-1
FISH TRANSFER FACTORS USED IN THE ASSESSMENT**

COPC	Fish Transfer Factor L/kg (fw)	Reference
Arsenic	62	Site specific - avg of Arctic Grayling and Slimy Sculpin
Cadium	215	Site specific - avg of Arctic Grayling and Slimy Sculpin
Copper	682	Site specific - avg of Arctic Grayling and Slimy Sculpin
Lead	68	Site specific - avg of Arctic Grayling and Slimy Sculpin
Manganese	196	Site specific - avg of Arctic Grayling and Slimy Sculpin
Nickel	48	Site specific - avg of Arctic Grayling and Slimy Sculpin
Silver	346	Site specific - avg of Arctic Grayling and Slimy Sculpin
Thallium	3740	NCEP 1996, U.S. EPA 1998 - geometric mean
Tin	120	Site specific - avg of Arctic Grayling and Slimy Sculpin
Zinc	1075	Site specific - avg of Arctic Grayling and Slimy Sculpin

Note: fw – fresh weight

E.2.2.2 Aquatic Vegetation

Contaminant concentrations in aquatic vegetation were assumed to equal measured concentrations from the site, when available. In the absence of measured site data for aquatic vegetation, contaminant concentrations were calculated using the following equation:

$$C_{aqveg} = C_{water} \times TF_{water-to-aqveg} \quad (E.2-3)$$

where:

- C_{aqveg} = concentration of contaminant in aquatic vegetation [mg/kg (ww)];
- C_{water} = water concentration [mg/L];
- $TF_{water-to-aqveg}$ = water-to-aquatic vegetation transfer factor [(mg/kg (ww))/(mg/L)].

The aquatic vegetation transfer factors used in this assessment are provided in Table E.2.2-2.

TABLE E.2.2-2
AQUATIC VEGETATION TRANSFER FACTORS USED IN THE ASSESSMENT

COPC	Aquatic Plants Transfer Factors L/kg ww	Reference
Arsenic	5	CSA1987, Bird and Schwartz 1996 (geomean)
Cadmium	19000	Bird and Schwartz 1996
Copper	145	ORNL 1976, Bird and Schwartz 1996 (geomean)
Lead	150	Bird and Schwartz 1996
Manganese	170	Bird and Schwartz 1996
Nickel	15	Bird and Schwartz 1996
Silver	1000	Napier <i>et al.</i> 1988
Thallium	1	Napier <i>et al.</i> 1988
Tin	100	NRCC 1983
Zinc	1300	CSA1987, Bird and Schwartz 1996 (geomean)

E.2.2.3 Aquatic Biota

Contaminant concentrations in benthic invertebrates were assumed to equal measured concentrations from the site, when available. In the absence of measured site data for benthic invertebrates, contaminant concentrations were calculated using the following equation:

$$C_{benthos} = C_{water} \times TF_{water-to-benthos} \quad (E.2-4)$$

where:

- $C_{benthos}$ = concentration of contaminant in benthic invertebrates [mg/kg (ww)]
- C_{water} = water concentration [mg/L]
- $TF_{water-to-benthos}$ = water-to-benthic invertebrate transfer factor [(mg/kg (ww))/(mg/L)]

The benthic invertebrate transfer factors used in this assessment are provided in Table E.2.2-3.

TABLE E.2.2-3
BENTHIC INVERTEBRATE TRANSFER FACTORS USED IN THE ASSESSMENT

COPC	Benthic Invertebrate Transfer Factor L/kg ww	Reference
Arsenic	1700	U.S. EPA 1979
Cadmium	4000	U.S. EPA 1979
Copper	1000	U.S. EPA 1979
Lead	100	U.S. EPA 1979
Manganese	1000	(using sediment K_d) IAEA 1994
Nickel	100	U.S. EPA 1979
Silver	200	Napier <i>et al.</i> 1988

COPC	Benthic Invertebrate Transfer Factor L/kg ww	Reference
Thallium	1000	Napier <i>et al.</i> 1988
Tin	1000	NRCC 1983
Zinc	2687.5	2.5 x transfer to fish (SETAC paper)

E.2.3 Terrestrial Biota Equations

The terrestrial biota equations draw on information from several other equations to calculate the concentration of COPC in animal flesh and also describe how COPC move into wild game consumed by humans. Wild game considered in the human risk assessment included caribou, grouse, ducks (mallard, merganser, scaup), moose, sheep and wolf. In general, modelled data are used in this assessment. Where measured data do not exist, the following equations are used.

For the Anvil Range Mine Risk Assessment, the following terrestrial biota were considered:

<u>Herbivores</u>	<u>Carnivores</u>	<u>Omnivores</u>
Woodland Caribou	Mink	Black bear
Snowshoe hare	Wolf	Mallard
Moose		Merganser
Fannin sheep		Scaup
Hoary marmot		Red fox
Beaver		
Grouse		

The parameter values used in the terrestrial biota models are provided in Tables E.2.3-1 to E.2.3-3 and Appendix D.

E.2.3.1 Terrestrial Herbivores

For herbivores, the calculation of the concentration of each COPC in animal flesh may include many possible subsets of browse, forage, berries, water, or aquatic vegetation-to-herbivore flesh pathways.

COPC in terrestrial and aquatic vegetation and water may be eaten by herbivores, which may in turn be eaten by people. This transfer for each COPC is calculated as follows:

$$[C]_h = \left(\sum ([C]_v F_{h,v}) Q_h + [C]_w Q_{h,w} + [C]_s Q_{h,s} \right) F_L T_h \quad (E.2-5)$$

Where:

$[C]_h$ = annual average concentration of COPC in herbivore (type “h”) flesh (Bq/g (wet weight) or g/g (wet weight));

$[C]_v$	=	average concentration of each COPC in vegetation type “v” (Bq/g (wet weight) or g/g (wet weight));
$F_{h,v}$	=	fraction of feed for herbivore type “h” that is vegetation type “v”;
Q_h	=	average daily feed intake of herbivore type “h” (g (wet weight)/d);
$[C]_w$	=	average concentration of each COPC in water (Bq/m ³ or g/m ³);
$Q_{h,w}$	=	average daily water intake of herbivore type “h” (m ³ /d);
$[C]_s$	=	average concentration of each COPC in sediment/soil (Bq/g or g/g);
$Q_{h,s}$	=	average daily sediment/soil intake of herbivore type “h” (g/d);
T_h	=	feed-to-herbivore (type “h”) flesh transfer coefficient (Bq/g (wet weight) per Bq/d or g/g (wet weight) per g/d);
F_L	=	herbivore type “h” fraction of year in area (default = 1.0).

Large mammal, small mammal and bird transfer factors are provided in Tables E.2.3-1 to E.2.3-3.

E.2.3.2 Omnivores

In addition to vegetation, drinking water and sediment or soil, omnivores may consume aquatic and/or terrestrial herbivores, omnivores or carnivores. The transfer for each COPC to omnivores is calculated as follows:

$$[C]_o = \left(\left(\sum ([C]_v F_{o,v}) Q_{o,f} + \left(\sum [C]_m F_{o,m} \right) Q_{o,m} + ([C]_s Q_{o,s}) T_{o,f} + ([C]_w Q_{o,w} T_{w,o}) \right) F_L \right) \quad (E.2-6)$$

Where:

$[C]_o$	=	annual average concentration of COPC in omnivore (type “o”) flesh (Bq/g (wet weight) or g/g (wet weight));
$[C]_v$	=	average concentration of each COPC in vegetation type “v” (Bq/g (wet weight) or g/g (wet weight));
$F_{o,v}$	=	fraction of feed for omnivore type “o” that is vegetation type “v”;
$Q_{o,f}$	=	average daily feed intake of omnivore type “o” (g/d);
$[C]_m$	=	average concentration of each COPC in meat flesh type “m” (Bq/g (wet weight) or g/g (wet weight));
$F_{o,m}$	=	fraction of feed for omnivore type “o” that is meat flesh type “m”;
$Q_{o,m}$	=	average daily feed for omnivore type “o” that is meat flesh type “m” (g/d);
$[C]_s$	=	average concentration of each COPC in sediment or soil (Bq/g or g/g);
$Q_{o,s}$	=	average daily feed for omnivore type “o” that is sediment or soil (g/d);
$T_{f,o}$	=	feed-to-omnivore (type “o”) flesh transfer coefficient (Bq/g (wet weight) per Bq/d or g/g (wet weight) per g/d);
$[C]_w$	=	average concentration of each COPC in water (Bq/m ³ or g/m ³);
$Q_{o,w}$	=	average daily water intake of omnivore type “o” (m ³ /d);

- $T_{w,o}$ = water-to-omnivore (type “o”) flesh transfer coefficient (Bq/g (wet weight) per Bq/d or g/g (wet weight) per g/d);
- F_L = omnivore type “o” fraction of year in area (default = 1.0).

Large mammal, small mammal and bird transfer factors are provided in Tables E.2.3-1 to E.2.3-3.

E.2.3.3 Carnivores

Carnivores consume drinking water, aquatic and/or terrestrial herbivores, omnivores or carnivores and sediment or soil. The transfer for each COPC to carnivores is calculated as follows:

$$[C]_c = \{((\sum [C]_m F_{c,m}) Q_{c,m} + [C]_s Q_{c,s}) T_{c,m} + ([C]_w Q_{c,w} T_{w,c})\} F_L \quad (E.2-7)$$

Where:

- $[C]_c$ = annual average concentration of metal in carnivore (type “c”) flesh (Bq/g (wet weight) or g/g (wet weight));
- $Q_{c,m}$ = average daily feed intake of carnivore type “c” (g/d);
- $[C]_m$ = average concentration of each metal in meat flesh type “m” (Bq/g (wet weight) or g/g (wet weight));
- $F_{c,m}$ = fraction of feed for carnivore type “c” that is meat flesh type “m”;
- $[C]_s$ = average concentration of each COPC in sediment or soil (Bq/g or g/g);
- $Q_{c,s}$ = average daily feed for carnivore type “c” that is sediment or soil (g/d);
- $T_{c,m}$ = feed-to-carnivore (type “c”) flesh transfer coefficient (Bq/g (wet weight) per Bq/d or g/g (wet weight) per g/d);
- $[C]_w$ = average concentration of each COPC in water (Bq/m³ or g/m³);
- $Q_{c,w}$ = average daily water intake of carnivore type “c” (m³/d);
- $T_{w,c}$ = water-to-carnivore (type “c”) flesh transfer coefficient (Bq/g (wet weight) per Bq/d or g/g (wet weight) per g/d);
- F_L = carnivore type “c” fraction of year in area (default = 1.0).

Large mammal, small mammal and bird transfer factors are provided in Tables E.2.3-1 to E.2.3-3.

TABLE E.2.3-1
LARGE MAMMAL TRANSFER FACTORS⁽¹⁾ USED IN THE ASSESSMENT

	Large Mammal Transfer Factor d/kg ww	Reference
Arsenic	0.002	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987
Cadmium	0.00052	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987
Copper	0.01	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987
Lead	0.0004	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987
	0.001 (for caribou)	Thomas <i>et al.</i> 1994 ⁽²⁾
	0.085 (for wolf)	Thomas <i>et al.</i> 1994 ⁽²⁾
Manganese	0.0005	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987
Nickel	0.006	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987
Silver	0.003	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987
Thallium	0.03	NCRP 1996, Baes <i>et al.</i> 1984
Tin	0.03	NCRP 1996, Baes <i>et al.</i> 1984
Zinc	0.1	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987
	4.1 (for sheep)	IAEA 1994

Note:

(1) based on feed to beef transfer factors

(2) calculated from data for Pb-210 and Po-210 in Thomas *et al.* 1994.

TABLE E.2.3-2
SMALL MAMMAL TRANSFER FACTORS⁽¹⁾ USED IN THE ASSESSMENT

	Small Mammal Transfer Factor d/kg ww	Reference
Arsenic	0.002	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987
Cadmium	0.00052	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987
Copper	0.01	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987
Lead	0.14	Thomas 1997 ⁽²⁾
	0.01 (for beaver)	Létourneau 1987 ⁽³⁾
Manganese	0.0005	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987
Nickel	0.006	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987
Silver	0.003	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987
Thallium	0.03	NCRP 1996, Baes <i>et al.</i> 1984
Tin	0.03	NCRP 1996, Baes <i>et al.</i> 1984
Zinc	0.1	IAEA 1994, NCRP 1996, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987

Note:

(1) based on feed to beef transfer factors

(2) calculated from data for Pb-210 and Po-210 in Thomas *et al.* 1994.

(3) based on transfer factors for beaver provided in Létourneau 1987

TABLE E.2.3-3
BIRD TRANSFER FACTORS USED IN THE ASSESSMENT

	Bird Transfer Factor d/kg ww	Reference
Arsenic	1	IAEA 1994, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987*
Cadmium	0.8	IAEA 1994, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987*
Copper	0.5	IAEA 1994, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987*
Lead	0.2	IAEA 1994, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987*
Manganese	0.05	IAEA 1994, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987*
Nickel	3	IAEA 1994, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987*
Silver	2	IAEA 1994, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987*
Thallium	15	IAEA 1994, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987*
Tin	15	IAEA 1994, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987*
Zinc	7	IAEA 1994, Baes <i>et al.</i> 1984, U.S. EPA 1998, CSA 1987*

Note:

*Based on feed-to-poultry information available in IAEA 1994, Baes *et al.* 1984, U.S. EPA 1998, CSA 1987. When transfer factors were not available for poultry (As, Pb, Ni, V, Po, Th) the beef transfer factors was multiplied by a factor of 500 derived from the geometric mean of the ratio between the transfer factors for beef to chicken for Cd, Cu, Mo, Se, Zn, U, Ra.

E.3 EXPOSURE CALCULATIONS FOR THE ECOLOGICAL RISK ASSESSMENT

This section details the approach taken in the risk assessment to assess the exposures to contaminants of potential concern for the aquatic receptors and the intakes of contaminants of concern by the terrestrial receptors. As the exposure assessment for aquatic receptors was straightforward, most of the discussion pertains to the methodology followed to estimate intakes for each of the exposure pathways for terrestrial receptors.

E.3.1 Aquatic Ecological Receptors

Potential impacts from metals to aquatic ecological receptors were assessed by the comparison of the measured water and sediment concentrations with toxicity benchmarks (discussed in Chapter 5.0 of the main report) for each of the receptors. Therefore, further calculation of exposure to aquatic receptors was not required. A discussion of the predicted impacts and their significance is provided in Chapter 6.0 of the main report.

E.3.2 Terrestrial Ecological Receptors

The assessment of metal intakes by terrestrial species considered exposure through the ingestion pathway. Estimated rates of metal ingestion were calculated for the terrestrial receptors, using the environmental concentrations reported in Chapter 2.2 of the main report and receptor characteristics outlined in Chapter 4.1 of the main report. Ingestion pathways considered in the assessment included consumption of water, fish, aquatic plants, benthic animals and sediments

from Rose Creek and Vangorda Creek. Equation (E.3-1) shows the calculation for exposure through the ingestion of water, and equations (E.3-2) and (E.3-3) show the calculations for the sediment and food ingestion pathways.

For water ingestion:

$$I_{water} = \frac{C_{water} \times R_{water} \times F_{site}}{BW} \quad (E.3-1)$$

where:

- I_{water} = exposure to contaminant through the water pathway [mg/(kg d)];
- C_{water} = measured water concentration, mean or 95th percentile UCL of mean [mg/L];
- R_{water} = water ingestion rate [L/d];
- F_{site} = fraction of time at site [-];
- BW = body weight [kg].

For sediment ingestion:

$$I_{sediment} = \frac{C_{sediment} \times R_{sediment} \times F_{site}}{BW} \quad (E.3-2)$$

where:

- $I_{sediment}$ = exposure to contaminant through the sediment pathway [mg/(kg d)];
- $C_{sediment}$ = measured sediment concentration, mean or 95th percentile UCL of mean [mg/kg];
- $R_{sediment}$ = sediment ingestion rate [kg/d];
- F_{site} = fraction of time at site [-];
- BW = body weight [kg].

For food ingestion:

$$I_i = \frac{C_i \times R_{food} \times F_i \times F_{site}}{BW} \quad (E.3-3)$$

where:

- I_i = exposure to contaminant through the pathway i = benthic invertebrates, fish, hare [mg/(kg d)];
- C_i = derived concentration for i = benthic invertebrates and hare [mg/kg] {see Appendix B} and measured concentration for fish;
- R_{food} = food ingestion rate [kg/d];
- F_i = fraction of food that is i = benthic invertebrates, fish and hare [-];
- F_{site} = fraction of time at site [-];
- BW = body weight [kg].

E.4 EXPOSURE CALCULATIONS FOR THE HUMAN HEALTH RISK ASSESSMENT

The exposure assessment for contaminants to humans considered the ingestion and dermal pathways.

E.4.1 Ingestion Pathway

Ingestion intake by human receptors was calculated using equation (E.4-1) for the water pathway, equation (E.4-2) for the soil pathway, equation (E.4-3) for the sediment pathway, and equation (E.4-4) for the food pathway:

Water Pathway

$$I_{water} = \frac{C_{water} \times R_{water} \times F_{site}}{BW} \quad (E.4-1)$$

where:

I_{water}	=	exposure to contaminant through the water pathway [mg/(kg d)];
C_{water}	=	measured water concentration [mg/L];
R_{water}	=	water ingestion rate [L/d];
F_{site}	=	fraction of time at site [-];
BW	=	body weight [kg].

Soil Pathway

$$I_{soil} = \frac{C_{soil} \times R_{soil} \times F_{site}}{BW} \times \frac{1}{1000} \quad (E.4-2)$$

where:

I_{soil}	=	exposure to contaminant through the soil pathway [mg/(kg d)];
C_{soil}	=	soil concentration [mg/kg (dw)];
R_{soil}	=	soil ingestion rate [g (dw)/d];
F_{site}	=	fraction of time at site [-];
BW	=	body weight [kg];
1/1000	=	unit conversion factor [kg/g].

Sediment Pathway

$$I_{sed} = \frac{C_{sed} \times R_{sed} \times F_{site}}{BW} \times \frac{1}{1000} \quad (E.4-3)$$

where:

I_{sed}	=	exposure to contaminant through the sediment pathway [mg/(kg d)];
C_{sed}	=	sediment concentration [mg/kg (dw)];
R_{sed}	=	sediment ingestion rate [g (dw)/d];
F_{site}	=	fraction of time at site [-];
BW	=	body weight [kg];
1/1000	=	unit conversion factor [kg/g].

Food Intake Pathway

$$I_{food\ x} = \frac{C_x \times R_x \times F_{site}}{BW} \times \frac{1}{1000} \quad (E.4-4)$$

where:

$I_{food\ x}$	=	exposure to contaminant through the food pathway [mg/(kg d)], where x is fish, berry, browse, forage, lichen, hare, beaver, moose, caribou, sheep, grouse, and mallard, as applicable;
C_x	=	concentration of contaminant [mg/kg (ww)] for each x;
R_x	=	food ingestion rate of x [g (ww)/d], where x is berry, caribou, fish, grouse, hare, mallard, moose, muskrat and sheep, as applicable;
F_{site}	=	fraction of time at site [-];
BW	=	body weight [kg];
1/1000	=	unit conversion factor [kg/g].

E.4.2 Dermal Pathway

Dermal exposure for human receptors was calculated using the following equation for the dermal pathway.

$$I_{dermal} = \frac{C_{soil} \times SA \times EA \times SL \times RAF \times EF \times F_{site}}{BW} \quad (E.4.5)$$

where:

I_{dermal}	=	exposure to contaminant in soil through the dermal pathway [mg/(kg d)];
C_{soil}	=	soil concentration [mg/kg (dw)] ;
SA	=	skin surface area – total [cm ²] ;
EA	=	exposed fraction of skin [-];
SL	=	loading to exposed skin [kg (dw)/(cm ² event)];
RAF	=	dermal absorption factor [-];
EF	=	exposure frequency [events/d];
F_{site}	=	fraction of time at site [-];
BW	=	body weight [kg].

E.5 REFERENCES

- Baes, C.F., R.D. Sharp, A.L. Sjoeren, and R.W. Shar 1984. *A Review and Analysis of Parameters for Assessing Transport of Environmentally Released Radionuclides Through Agriculture*. ORNL-5786.
- Bird, G.A. and W. Schwartz 1996. *Nuclide Concentration Factors for Freshwater Biota*. AECL. Technical Record TR-703.
- Canadian Standards Association (CSA) 1987. *Guidelines for Calculating Derived Release Rate Limits for Radioactive Material in Airborne and Liquid Effluents for Normal Operation of Nuclear Facilities*. CAN ICSA-N288.1-M87.
- International Atomic Energy Agency (IAEA) 1994. *Handbook of Parameter Values for the Prediction of Radionuclide Transfer in Temperate Environments*. International Atomic Energy Agency, Vienna.
- Létourneau, C. 1987. *Transfer of Radionuclides of the Uranium and Thorium Decay Chains in Aquatic and Terrestrial Environments*. Prepared for Atomic Energy Control Board. April.
- Napier, B. 1988. *GENII-- The Hanford Environmental Radiation Dosimetry Software System*. PNL-6584, Pacific Northwest Laboratory, Richland, Washington.
- National Council on Radiation Protection and Measurements (NCRP) 1996. *Screening Models for Releases of Radionuclides to Atmosphere, Surface Water, and Ground*. NCRP Report No. 123.
- National Research Council of Canada (NRCC). 1983. *Radioactivity in the Canadian Aquatic Environment*. 19250.
- Oak Ridge National Laboratory (ORNL). 1976. *A Methodology for Calculating Radiation Doses from Radioactivity Released to the Environment*. Environmental Sciences Division Publication No. 660, March.
- Morrissey, C.A. Bendell-Young, L.I., and Elliott, J.E. 2005. *Assessing Trace-Metal Exposure to American Dippers in Mountain Streams of Southwestern British Columbia, Canada*. Environmental Toxicology and Chemistry. Vol. 24, No. 4. pp. 836-845.

- Thomas, P.A., J.W. Sheard and S. Swanson 1994. *Transfer of Po-210 and Pb-210 Through the Lichen-Caribou-Wolf Food Chain of Northern Canada*. Health Physics, Vol. 66, No. 6, June, pp. 666-677.
- United States Environmental Protection Agency (U.S. EPA) 1998. *Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities*. Peer Review Draft. EPA 530-D-98-001.
- United States Environmental Protection Agency (U.S. EPA) 1979. *Water-Related Environmental Fate of 129 Priority Pollutants, Vol. 1*. EPA-4401 4-79-029a. Office of Water Planning and Standards, Washington D.C.
- United States Nuclear Regulatory Commission (U.S. NRC) 1992. *Residual Radioactive Contamination from Decommissioning: Technical Basis for Translating Contamination Levels to Annual Total Effective Dose Equivalent*. NUREG/CR-5512.

APPENDIX F

DETAILED CALCULATIONS

**(SUMMARY TERRESTRIAL ECOLOGICAL
RECEPTOR RESULTS)**

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APPENDIX F: DETAILED CALCULATIONS – SUMMARY RESULTS

F.1 GENERAL OVERVIEW

This section presents the calculated intake concentrations of each terrestrial ecological receptors. The intake concentrations are presented by individual pathways that contribute to the overall concentrations. These individual pathways include the following: water, sediment, soil, fish, benthic, aquatic vegetation, browse, forage, berries, lichen, hare, moose, caribou, and ducks. The percentage contributions of these pathways to the overall intake concentrations are also presented here.

The calculations were carried out for several scenarios:

1. Existing scenario;
2. No intervention future 1 scenario;
3. No intervention future 3 Scenario
4. Remediation future 2 scenario;
5. Remediation future 3 scenario; and
6. Treat all flows scenario.

APPENDIX F-1

EXISTING SCENARIO

**(SUMMARY TERRESTRIAL ECOLOGICAL
RECEPTOR RESULTS)**

by Pathway

Intake by Pathway (mg/kg d)

Arsenic	Caribou	Hare					Moose	Sheep	Grouse					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	1.78E-04	5.35E-05	1.17E-03	1.29E-04	1.29E-04	1.29E-04	2.05E-04	5.82E-04	4.35E-05	9.48E-04	1.05E-04	1.05E-04	1.05E-04	
Sediment	9.88E-03	7.64E-03	5.69E-02	1.77E-02	8.22E-02	8.27E-02	8.23E-03	8.07E-04	7.11E-03	5.29E-02	1.65E-02	7.65E-02	7.69E-02	
Soil														
Fish														
Benthic														
Aquatic Veg	7.40E-04	2.31E-02	2.50E-02	2.50E-02	1.01E-01	3.19E-02	6.78E-05	1.34E-02	3.73E-02	4.04E-02	4.04E-02	1.64E-01	5.16E-02	
Browse														
Forage														
Berries														
Lichen	4.76E-05	3.41E-03	1.61E-02	2.05E-03	2.51E-02	8.26E-03	9.92E-03	1.56E-03	5.49E-03	2.79E-04	3.33E-03	3.88E-04		
Hare														
Moose														
Caribou														
Ducks	2.68E-02													
Total	3.76E-02	3.42E-02	9.91E-02	4.49E-02	2.09E-01	1.23E-01	2.19E-02	1.13E-02	4.60E-02	9.98E-02	5.73E-02	2.43E-01	1.29E-01	

Cadmium	Caribou	Hare					Moose	Sheep	Grouse					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	2.74E-05	4.64E-05	1.44E-04	2.86E-05	2.86E-05	2.86E-05	3.17E-05	6.29E-05	3.77E-05	1.17E-04	2.32E-05	2.32E-05	2.32E-05	
Sediment	2.46E-03	1.00E-02	5.30E-03	1.75E-02	1.08E-02	7.79E-03	5.23E-04	9.69E-04	9.35E-03	4.93E-03	1.62E-02	1.00E-02	7.25E-03	
Soil														
Fish														
Benthic														
Aquatic Veg														
Browse	3.14E-03	2.63E-01	2.02E-01	3.60E-02	2.33E-01	2.93E-01	3.98E-02	3.31E-03	4.25E-01	3.26E-01	5.82E-02	3.77E-01	4.74E-01	
Forage	2.66E-05	1.09E-02	6.05E-03	1.37E-02	6.97E-03	9.84E-03	5.68E-02		6.90E-04	2.07E-03	7.99E-04	1.28E-03	3.59E-03	
Berries	5.41E-03													
Lichen														
Hare														
Moose														
Caribou														
Ducks														
Total	1.11E-02	2.84E-01	2.13E-01	6.72E-02	2.51E-01	3.10E-01	9.71E-02	4.34E-03	4.35E-01	3.34E-01	7.53E-02	3.88E-01	4.84E-01	

Copper	Caribou	Hare					Moose	Sheep	Grouse										
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall			Bkgd	Van-S	Faro-N	Faro-S	Faro-W					
Water	1.62E-04	4.63E-04	4.32E-04	1.47E-04	1.47E-04	1.47E-04	1.87E-04	2.27E-04	3.76E-04	3.51E-04	1.19E-04	1.19E-04	1.19E-04						
Sediment	4.54E-02	5.89E-02	1.43E-01	1.29E-01	4.06E-01	2.34E-01	4.13E-02	9.69E-03	5.48E-02	1.33E-01	1.20E-01	3.78E-01	2.18E-01						
Soil																			
Fish																			
Benthic																			
Aquatic Veg	3.90E-03	2.30E-01	2.99E-01	2.27E-01	3.17E-01	2.89E-01	1.80E-03	7.07E-02	3.71E-01	4.83E-01	3.66E-01	5.13E-01	4.68E-01						
Browse																			
Forage																			
Berries																			
Lichen	5.77E-04	1.41E-01	1.21E-01	1.45E-01	1.42E-01	1.37E-01	7.07E-02	2.08E-01	2.68E-02	5.95E-02	7.72E-02	4.15E-02	5.98E-02						
Hare	8.05E-02																		
Moose																			
Caribou																			
Ducks																			
Total	1.30E-01	4.30E-01	5.63E-01	5.01E-01	8.66E-01	6.61E-01	1.14E-01	2.18E-01	4.53E-01	6.75E-01	5.64E-01	9.33E-01	7.46E-01						

by Pathway

Intake by Pathway (m)

Arsenic	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	3.09E-05	3.99E-05	1.58E-04	3.61E-04	1.66E-05	7.02E-05	2.78E-05	3.59E-05	1.43E-04	3.25E-04	1.49E-05	6.32E-05	3.41E-05	4.40E-05	1.75E-04	3.99E-04	1.83E-05	7.76E-05
Sediment	7.71E-03	9.95E-03	3.95E-02	9.01E-02	4.13E-03	1.75E-02	5.00E-03	6.45E-03	2.56E-02	5.84E-02	2.68E-03	1.14E-02	3.35E-02	4.32E-02	1.71E-01	3.91E-01	1.79E-02	7.60E-02
Soil																		
Fish							8.37E-03	1.08E-02	4.29E-02	9.78E-02	4.48E-03	1.90E-02						
Benthic	1.57E-01	2.02E-01	8.03E-01	1.83E+00	8.40E-02	3.56E-01							2.53E-01	3.27E-01	1.30E+00	2.96E+00	1.36E-01	5.76E-01
Aquatic Veg	1.56E-04	2.01E-04	7.98E-04	1.82E-03	8.34E-05	3.54E-04							7.54E-05	9.72E-05	3.86E-04	8.80E-04	4.03E-05	1.71E-04
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	1.65E-01	2.12E-01	8.44E-01	1.92E+00	8.82E-02	3.74E-01	1.34E-02	1.73E-02	6.86E-02	1.57E-01	7.17E-03	3.04E-02	2.87E-01	3.70E-01	1.47E+00	3.35E+00	1.54E-01	6.52E-01

Cadmium	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	8.35E-06	8.84E-06	1.15E-05	4.47E-05	1.44E-05	1.68E-05	7.52E-06	7.96E-06	1.04E-05	4.02E-05	1.29E-05	1.51E-05	9.23E-06	9.77E-06	1.27E-05	4.93E-05	1.59E-05	1.85E-05
Sediment	8.59E-04	9.09E-04	1.18E-03	4.59E-03	1.48E-03	1.73E-03	5.57E-04	5.89E-04	7.67E-04	2.98E-03	9.57E-04	1.12E-03	3.73E-03	3.94E-03	5.13E-03	1.99E-02	6.40E-03	7.49E-03
Soil																		
Fish							7.84E-03	8.30E-03	1.08E-02	4.19E-02	1.35E-02	1.58E-02						
Benthic	9.97E-02	1.06E-01	1.37E-01	5.33E-01	1.71E-01	2.00E-01							1.61E-01	1.70E-01	2.22E-01	8.61E-01	2.77E-01	3.24E-01
Aquatic Veg	1.60E-01	1.69E-01	2.20E-01	8.55E-01	2.75E-01	3.21E-01							7.74E-02	8.19E-02	1.07E-01	4.14E-01	1.33E-01	1.55E-01
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	2.61E-01	2.76E-01	3.59E-01	1.39E+00	4.48E-01	5.23E-01	8.41E-03	8.90E-03	1.16E-02	4.50E-02	1.44E-02	1.69E-02	2.42E-01	2.56E-01	3.34E-01	1.29E+00	4.16E-01	4.87E-01

Copper	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	4.09E-05	4.54E-05	6.89E-05	1.34E-04	1.43E-04	1.86E-04	3.68E-05	4.09E-05	6.21E-05	1.20E-04	1.29E-04	1.68E-04	4.52E-05	5.02E-05	7.62E-05	1.48E-04	1.58E-04	2.06E-04
Sediment	5.61E-02	6.23E-02	9.45E-02	1.83E-01	1.96E-01	2.56E-01	3.64E-02	4.04E-02	6.13E-02	1.19E-01	1.27E-01	1.66E-01	2.43E-01	2.70E-01	4.10E-01	7.95E-01	8.51E-01	1.11E+00
Soil																		
Fish							1.22E-01	1.35E-01	2.05E-01	3.98E-01	4.26E-01	5.55E-01						
Benthic	1.22E-01	1.36E-01	2.06E-01	3.99E-01	4.27E-01	5.56E-01							1.97E-01	2.19E-01	3.32E-01	6.44E-01	6.90E-01	8.99E-01
Aquatic Veg	5.98E-03	6.64E-03	1.01E-02	1.95E-02	2.09E-02	2.72E-02							2.89E-03	3.21E-03	4.87E-03	9.45E-03	1.01E-02	1.32E-02
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	1.84E-01	2.05E-01	3.10E-01	6.02E-01	6.44E-01	8.39E-01	1.58E-01	1.76E-01	2.67E-01	5.17E-01	5.53E-01	7.21E-01	4.43E-01	4.93E-01	7.47E-01	1.45E+00	1.55E+00	2.02E+00

by Pathway

Intake by Pathway (m)

Pathway	Hoary Marmot					Bear			Wolf Overall	Mink					
	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	4.87E-05	1.06E-03	1.17E-04	1.17E-04	1.17E-04	3.42E-05	7.47E-04	8.25E-05	6.67E-05	1.07E-04	1.38E-04	5.46E-04	1.25E-03	5.71E-05	2.42E-04
Sediment										2.16E-02	2.78E-02	1.10E-01	2.52E-01	1.15E-02	4.90E-02
Soil	3.42E-03	2.55E-02	7.93E-03	3.68E-02	3.70E-02	2.61E-03	1.23E-02	2.05E-02	2.32E-03						
Fish						4.98E-04	1.09E-02	1.20E-03		9.55E-03	1.23E-02	4.89E-02	1.12E-01	5.11E-03	2.17E-02
Benthic										3.63E-02	4.68E-02	1.86E-01	4.24E-01	1.94E-02	8.23E-02
Aquatic Veg										5.92E-05	7.64E-05	3.03E-04	6.92E-04	3.17E-05	1.35E-04
Browse															
Forage	7.28E-03	3.43E-02	4.37E-03	5.36E-02	1.76E-02	1.28E-03	5.69E-03	7.79E-03							
Berries						1.54E-03	2.14E-03	2.59E-03							
Lichen									1.73E-06	1.05E-06	6.42E-06	1.05E-06	3.05E-06	1.05E-06	3.05E-06
Hare									3.36E-04						
Moose						1.22E-04	1.22E-04	1.22E-04	1.01E-04						
Caribou						3.67E-05	3.67E-05	3.67E-05							
Ducks										1.59E-03	2.05E-03	8.13E-03	1.85E-02	8.50E-04	3.61E-03
Total	1.08E-02	6.08E-02	1.24E-02	9.05E-02	5.48E-02	6.13E-03	3.19E-02	3.23E-02	2.83E-03	6.91E-02	8.91E-02	3.54E-01	8.08E-01	3.70E-02	1.57E-01

Pathway	Hoary Marmot					Bear			Wolf Overall	Mink					
	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	4.22E-05	1.31E-04	2.60E-05	2.60E-05	2.60E-05	2.97E-05	9.24E-05	1.83E-05	1.03E-05	2.88E-05	3.05E-05	3.97E-05	1.54E-04	4.95E-05	5.79E-05
Sediment										2.40E-03	2.54E-03	3.31E-03	1.28E-02	4.13E-03	4.82E-03
Soil	4.50E-03	2.37E-03	7.81E-03	4.82E-03	3.49E-03	3.44E-03	2.49E-03	3.00E-03	5.79E-04						
Fish						1.50E-03	4.66E-03	9.22E-04		8.95E-03	9.47E-03	1.23E-02	4.78E-02	1.54E-02	1.80E-02
Benthic										2.30E-02	2.44E-02	3.18E-02	1.23E-01	3.96E-02	4.63E-02
Aquatic Veg										6.08E-02	6.44E-02	8.38E-02	3.25E-01	1.05E-01	1.22E-01
Browse															
Forage	2.34E-02	1.29E-02	2.92E-02	1.49E-02	2.10E-02	4.12E-03	2.01E-03	2.27E-03							
Berries						6.82E-04	7.04E-04	1.09E-03							
Lichen									2.67E-06	3.44E-06	6.93E-06	3.44E-06	4.51E-06	3.44E-06	4.51E-06
Hare									4.55E-04						
Moose						1.65E-04	1.65E-04	1.65E-04	9.11E-05						
Caribou						3.31E-05	3.31E-05	3.31E-05							
Ducks										2.33E-03	2.59E-03	3.93E-03	7.62E-03	8.16E-03	1.06E-02
Total	2.79E-02	1.54E-02	3.70E-02	1.97E-02	2.45E-02	9.96E-03	1.02E-02	7.50E-03	1.14E-03	9.76E-02	1.03E-01	1.35E-01	5.17E-01	1.72E-01	2.02E-01

Pathway	Hoary Marmot					Bear			Wolf Overall	Mink					
	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	4.21E-04	3.93E-04	1.34E-04	1.34E-04	1.34E-04	2.96E-04	2.77E-04	9.40E-05	6.10E-05	1.41E-04	1.57E-04	2.38E-04	4.61E-04	4.93E-04	6.43E-04
Sediment										1.57E-01	1.74E-01	2.64E-01	5.12E-01	5.48E-01	7.14E-01
Soil	2.63E-02	6.38E-02	5.78E-02	1.82E-01	1.05E-01	2.01E-02	3.64E-02	1.02E-01	1.07E-02						
Fish						4.73E-02	4.42E-02	1.50E-02		1.39E-01	1.54E-01	2.34E-01	4.54E-01	4.86E-01	6.33E-01
Benthic										2.82E-02	3.13E-02	4.76E-02	9.22E-02	9.87E-02	1.29E-01
Aquatic Veg										2.27E-03	2.52E-03	3.83E-03	7.43E-03	7.95E-03	1.04E-02
Browse															
Forage	3.00E-01	2.58E-01	3.10E-01	3.03E-01	2.93E-01	5.30E-02	4.79E-02	4.67E-02							
Berries						2.65E-02	5.38E-02	3.84E-02							
Lichen									5.14E-05	6.62E-05	1.33E-04	6.62E-05	8.67E-05	6.62E-05	8.67E-05
Hare									8.74E-03						
Moose						3.17E-03	3.17E-03	3.17E-03	1.75E-03						
Caribou						6.36E-04	6.36E-04	6.36E-04							
Ducks										1.46E-03	1.62E-03	2.46E-03	4.76E-03	5.10E-03	6.64E-03
Total	3.27E-01	3.23E-01	3.68E-01	4.85E-01	3.97E-01	1.51E-01	1.86E-01	2.06E-01	2.13E-02	3.28E-01	3.64E-01	5.53E-01	1.07E+00	1.15E+00	1.49E+00

by Pathway

Intake by Pathway (m)

Arsenic	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	7.76E-05	1.00E-04	3.98E-04	9.07E-04	4.16E-05	1.76E-04	4.91E-05	1.07E-03	1.18E-04
Sediment	4.08E-03	5.27E-03	2.09E-02	4.77E-02	2.19E-03	9.28E-03	1.08E-03	5.08E-03	8.51E-03
Soil									
Fish									
Benthic									
Aquatic Veg	1.12E-04	1.45E-04	5.75E-04	1.31E-03	6.01E-05	2.55E-04			
Browse	3.66E-03	1.16E-02	3.66E-03	3.97E-03	3.66E-03	3.97E-03			
Forage							4.01E-04	5.58E-04	6.75E-04
Berries									
Lichen							2.84E-06	8.25E-06	1.74E-05
Hare									
Moose									
Caribou									
Ducks							2.24E-03	4.89E-02	5.40E-03
Total	7.94E-03	1.72E-02	2.56E-02	5.39E-02	5.95E-03	1.37E-02	3.78E-03	5.57E-02	1.47E-02

Cadmium	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	2.10E-05	2.22E-05	2.89E-05	1.12E-04	3.60E-05	4.21E-05	4.26E-05	1.32E-04	2.62E-05
Sediment	4.55E-04	4.81E-04	6.27E-04	2.43E-03	7.81E-04	9.13E-04	1.43E-03	1.03E-03	1.24E-03
Soil									
Fish									
Benthic									
Aquatic Veg	1.15E-01	1.22E-01	1.59E-01	6.16E-01	1.98E-01	2.31E-01			
Browse	4.18E-02	3.50E-02	4.18E-02	8.53E-02	4.18E-02	8.53E-02			
Forage							1.78E-04	1.84E-04	2.85E-04
Berries									
Lichen							9.30E-06	1.22E-05	1.87E-05
Hare									
Moose									
Caribou									
Ducks							2.15E-02	2.01E-02	6.84E-03
Total	1.57E-01	1.57E-01	2.01E-01	7.04E-01	2.41E-01	3.18E-01	2.32E-02	2.15E-02	8.41E-03

Copper	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.03E-04	1.14E-04	1.73E-04	3.36E-04	3.59E-04	4.68E-04	4.24E-04	3.96E-04	1.35E-04
Sediment	2.97E-02	3.30E-02	5.00E-02	9.70E-02	1.04E-01	1.35E-01	8.35E-03	1.51E-02	4.22E-02
Soil									
Fish									
Benthic									
Aquatic Veg	4.30E-03	4.78E-03	7.26E-03	1.41E-02	1.51E-02	1.96E-02			
Browse	3.65E-02	4.66E-02	3.65E-02	5.88E-02	3.65E-02	5.88E-02			
Forage							6.90E-03	1.40E-02	1.00E-02
Berries									
Lichen							1.79E-04	2.34E-04	3.60E-04
Hare									
Moose									
Caribou									
Ducks							1.35E-02	1.26E-02	4.27E-03
Total	7.06E-02	8.45E-02	9.39E-02	1.70E-01	1.56E-01	2.14E-01	2.93E-02	4.23E-02	5.70E-02

by Pathway

Lead	Caribou	Hare					Moose	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	2.00E-04	3.96E-04	7.18E-04	4.60E-04	4.60E-04	4.60E-04	2.30E-04	3.91E-04	3.21E-04	5.83E-04	3.74E-04	3.74E-04	3.74E-04
Sediment							3.05E-02						
Soil	6.91E-01	4.69E-02	1.01E+00	9.32E-01	8.20E+00	3.73E+00		2.91E-02	4.37E-02	9.38E-01	8.68E-01	7.63E+00	3.47E+00
Fish													
Benthic							2.29E-03						
Aquatic Veg							1.46E-01						
Browse	8.09E-03	1.38E-02	1.32E-01	7.10E-01	1.32E+00	6.31E-02		1.20E-02	2.24E-02	2.13E-01	1.15E+00	2.13E+00	1.02E-01
Forage	1.04E-03	2.77E-03	1.18E-01	1.94E-02	8.80E-01	6.39E-02							
Berries									7.02E-04	9.71E-03	7.98E-03	2.46E-02	3.96E-03
Lichen	1.41E+00												
Hare													
Moose													
Caribou													
Ducks													
Total	2.11E+00	6.39E-02	1.26E+00	1.66E+00	1.04E+01	3.86E+00	1.79E-01	4.14E-02	6.70E-02	1.16E+00	2.02E+00	9.79E+00	3.58E+00

Manganese	Caribou	Hare					Moose	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	6.98E-03	1.30E-03	2.28E-03	6.58E-02	6.58E-02	6.58E-02	8.05E-03	1.48E-03	1.06E-03	1.85E-03	5.34E-02	5.34E-02	5.34E-02
Sediment							6.39E-01						
Soil	7.58E-01	4.07E+00	5.63E+00	1.67E+00	1.49E+00	2.18E+00		1.07E+00	3.79E+00	5.24E+00	1.56E+00	1.39E+00	2.03E+00
Fish													
Benthic							9.05E-02						
Aquatic Veg							8.27E+00						
Browse	4.57E-01	3.96E+01	3.91E+01	1.16E+01	1.04E+01	5.10E+01		1.77E+01	6.41E+01	6.33E+01	1.88E+01	1.68E+01	8.24E+01
Forage	6.27E-02	1.70E+01	1.59E+01	1.83E+01	1.21E+01	3.34E+01			1.09E+00	3.26E-01	3.37E+00	8.54E-01	1.55E+00
Berries													
Lichen	1.89E+00												
Hare													
Moose													
Caribou													
Ducks													
Total	3.18E+00	6.08E+01	6.06E+01	3.16E+01	2.40E+01	8.66E+01	9.01E+00	1.88E+01	6.90E+01	6.89E+01	2.38E+01	1.91E+01	8.61E+01

Nickel	Caribou	Hare					Moose	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	2.08E-04	9.29E-05	8.46E-04	2.88E-04	2.88E-04	2.88E-04	2.39E-04	4.84E-04	7.54E-05	6.87E-04	2.34E-04	2.34E-04	2.34E-04
Sediment							1.79E-02						
Soil	1.05E-02	2.72E-02	9.78E-02	2.42E-02	5.45E-02	4.66E-02		1.61E-03	2.53E-02	9.11E-02	2.26E-02	5.07E-02	4.34E-02
Fish													
Benthic							2.37E-04						
Aquatic Veg							4.72E-02						
Browse	2.61E-03	1.52E-01	1.79E-01	3.00E-02	2.02E-01	3.05E-01		9.51E-02	2.46E-01	2.90E-01	4.85E-02	3.26E-01	4.94E-01
Forage	2.27E-04	2.32E-02	6.73E-02	6.16E-02	4.45E-02	2.14E-01			4.29E-03	8.91E-03	6.20E-03	5.09E-03	3.40E-02
Berries													
Lichen	1.34E-02												
Hare													
Moose													
Caribou													
Ducks													
Total	2.69E-02	2.03E-01	3.45E-01	1.16E-01	3.01E-01	5.67E-01	6.56E-02	9.72E-02	2.76E-01	3.90E-01	7.75E-02	3.82E-01	5.71E-01

by Pathway

Lead	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	7.72E-05	1.42E-04	1.27E-04	2.22E-04	1.22E-04	6.99E-05	6.95E-05	1.28E-04	1.15E-04	2.00E-04	1.10E-04	6.29E-05	8.53E-05	1.57E-04	1.41E-04	2.45E-04	1.35E-04	7.72E-05
Sediment	6.35E-02	1.17E-01	1.05E-01	1.83E-01	1.01E-01	5.75E-02	4.12E-02	7.59E-02	6.79E-02	1.18E-01	6.52E-02	3.73E-02	2.75E-01	5.08E-01	4.54E-01	7.92E-01	4.37E-01	2.49E-01
Soil																		
Fish							2.29E-02	4.23E-02	3.78E-02	6.59E-02	3.63E-02	2.07E-02						
Benthic	2.30E-02	4.25E-02	3.80E-02	6.62E-02	3.65E-02	2.08E-02							3.72E-02	6.86E-02	6.14E-02	1.07E-01	5.90E-02	3.37E-02
Aquatic Veg	1.17E-02	2.15E-02	1.93E-02	3.36E-02	1.85E-02	1.06E-02							5.64E-03	1.04E-02	9.31E-03	1.62E-02	8.95E-03	5.11E-03
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	9.83E-02	1.81E-01	1.62E-01	2.83E-01	1.56E-01	8.89E-02	6.41E-02	1.18E-01	1.06E-01	1.84E-01	1.02E-01	5.81E-02	3.18E-01	5.87E-01	5.25E-01	9.16E-01	5.05E-01	2.88E-01

Manganese	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.29E-03	2.03E-02	6.12E-04	7.06E-04	4.02E-04	3.23E-03	1.16E-03	1.83E-02	5.51E-04	6.36E-04	3.62E-04	2.91E-03	1.43E-03	2.25E-02	6.76E-04	7.80E-04	4.44E-04	3.57E-03
Sediment	6.37E-01	1.00E+01	3.02E-01	3.48E-01	1.98E-01	1.59E+00	4.13E-01	6.51E+00	1.96E-01	2.26E-01	1.29E-01	1.03E+00	2.76E+00	4.35E+01	1.31E+00	1.51E+00	8.60E-01	6.91E+00
Soil																		
Fish							1.10E+00	1.74E+01	5.24E-01	6.04E-01	3.44E-01	2.76E+00						
Benthic	3.85E+00	6.07E+01	1.83E+00	2.11E+00	1.20E+00	9.64E+00							6.22E+00	9.80E+01	2.95E+00	3.40E+00	1.94E+00	1.56E+01
Aquatic Veg	2.21E-01	3.48E+00	1.05E-01	1.21E-01	6.89E-02	5.53E-01							1.07E-01	1.69E+00	5.07E-02	5.85E-02	3.33E-02	2.68E-01
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	4.71E+00	7.42E+01	2.23E+00	2.58E+00	1.47E+00	1.18E+01	1.52E+00	2.39E+01	7.20E-01	8.31E-01	4.73E-01	3.80E+00	9.09E+00	1.43E+02	4.31E+00	4.97E+00	2.83E+00	2.28E+01

Nickel	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	3.91E-05	8.91E-05	1.70E-04	2.61E-04	2.87E-05	2.02E-04	3.52E-05	8.02E-05	1.53E-04	2.35E-04	2.59E-05	1.81E-04	4.32E-05	9.84E-05	1.88E-04	2.89E-04	3.17E-05	2.23E-04
Sediment	1.82E-02	4.15E-02	7.94E-02	1.22E-01	1.34E-02	9.39E-02	1.18E-02	2.69E-02	5.15E-02	7.90E-02	8.67E-03	6.09E-02	7.91E-02	1.80E-01	3.44E-01	5.29E-01	5.80E-02	4.08E-01
Soil																		
Fish							8.20E-03	1.87E-02	3.57E-02	5.48E-02	6.02E-03	4.22E-02						
Benthic	1.17E-02	2.66E-02	5.08E-02	7.80E-02	8.56E-03	6.01E-02							1.89E-02	4.30E-02	8.21E-02	1.26E-01	1.38E-02	9.72E-02
Aquatic Veg	5.92E-04	1.35E-03	2.58E-03	3.95E-03	4.34E-04	3.05E-03							2.86E-04	6.52E-04	1.25E-03	1.91E-03	2.10E-04	1.47E-03
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	3.05E-02	6.96E-02	1.33E-01	2.04E-01	2.24E-02	1.57E-01	2.01E-02	4.57E-02	8.73E-02	1.34E-01	1.47E-02	1.03E-01	9.83E-02	2.24E-01	4.28E-01	6.57E-01	7.21E-02	5.06E-01

by Pathway

Lead	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water Sediment Soil Fish Benthic Aquatic Veg Browse Forage Berries Lichen Hare Moose Caribou Ducks	3.60E-04	6.53E-04	4.19E-04	4.19E-04	4.19E-04	2.53E-04	4.59E-04	2.94E-04	7.50E-05	2.66E-04	4.91E-04	4.39E-04	7.65E-04	4.22E-04	2.41E-04
	2.10E-02	4.51E-01	4.17E-01	3.67E+00	1.67E+00	1.61E-02	2.04E-01	1.95E+00	1.62E-01	1.77E-01	3.27E-01	2.93E-01	5.10E-01	2.81E-01	1.61E-01
						4.04E-03	7.32E-03	4.69E-03		2.61E-02	4.82E-02	4.31E-02	7.52E-02	4.14E-02	2.37E-02
										5.32E-03	9.82E-03	8.78E-03	1.53E-02	8.44E-03	4.82E-03
										4.44E-03	8.18E-03	7.32E-03	1.28E-02	7.03E-03	4.02E-03
	5.92E-03	2.52E-01	4.13E-02	1.88E+00	1.36E-01	1.04E-03	3.93E-02	2.37E-01							
						6.93E-04	3.65E-03	2.06E-02							
									4.11E-03	1.38E-04	2.24E-02	1.38E-04	2.71E-03	1.38E-04	2.71E-03
						2.00E-04	2.00E-04	2.00E-04	5.51E-04						
						1.03E-03	1.03E-03	1.03E-03	2.83E-03						
Total	2.73E-02	7.04E-01	4.59E-01	5.55E+00	1.81E+00	2.33E-02	2.56E-01	2.21E+00	1.70E-01	2.14E-01	4.17E-01	3.53E-01	6.18E-01	3.39E-01	1.96E-01

Manganese	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.18E-03	2.08E-03	5.98E-02	5.98E-02	5.98E-02	8.31E-04	1.46E-03	4.21E-02	2.62E-03	4.45E-03	7.01E-02	2.11E-03	2.43E-03	1.39E-03	1.11E-02
Sediment										1.78E+00	2.81E+01	8.44E-01	9.74E-01	5.54E-01	4.45E+00
Soil	1.82E+00	2.52E+00	7.49E-01	6.69E-01	9.74E-01	1.39E+00	1.80E+00	1.02E+00	1.78E-01						
Fish						3.82E-02	6.71E-02	1.93E+00		1.26E+00	1.99E+01	5.97E-01	6.89E-01	3.92E-01	3.15E+00
Benthic										8.90E-01	1.40E+01	4.22E-01	4.87E-01	2.77E-01	2.23E+00
Aquatic Veg										8.41E-02	1.32E+00	3.98E-02	4.60E-02	2.62E-02	2.10E-01
Browse															
Forage	3.64E+01	3.38E+01	3.90E+01	2.58E+01	7.13E+01	6.41E+00	1.46E+01	8.09E+00							
Berries						1.07E+00	6.59E-01	7.68E-01							
Lichen									2.24E-04	4.68E-04	1.85E-04	4.68E-04	4.67E-04	4.68E-04	4.67E-04
Hare									3.46E-02						
Moose						1.25E-02	1.25E-02	1.25E-02							
Caribou						7.74E-04	7.74E-04	7.74E-04	2.13E-03						
Ducks										2.71E-03	4.27E-02	1.28E-03	1.48E-03	8.44E-04	6.78E-03
Total	3.82E+01	3.64E+01	3.98E+01	2.65E+01	7.23E+01	8.93E+00	1.72E+01	1.19E+01	2.18E-01	4.02E+00	6.34E+01	1.91E+00	2.20E+00	1.25E+00	1.01E+01

Nickel	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	8.44E-05	7.69E-04	2.62E-04	2.62E-04	2.62E-04	5.94E-05	5.41E-04	1.84E-04	7.79E-05	1.35E-04	3.07E-04	5.87E-04	9.02E-04	9.90E-05	6.95E-04
Sediment										5.10E-02	1.16E-01	2.22E-01	3.41E-01	3.74E-02	2.63E-01
Soil	1.22E-02	4.38E-02	1.08E-02	2.44E-02	2.09E-02	9.30E-03	2.46E-02	1.86E-02	2.46E-03						
Fish						6.68E-04	6.09E-03	2.07E-03		9.36E-03	2.13E-02	4.07E-02	6.25E-02	6.86E-03	4.82E-02
Benthic										2.70E-03	6.15E-03	1.17E-02	1.80E-02	1.98E-03	1.39E-02
Aquatic Veg										2.25E-04	5.12E-04	9.79E-04	1.50E-03	1.65E-04	1.16E-03
Browse															
Forage	4.96E-02	1.44E-01	1.31E-01	9.50E-02	4.58E-01	8.74E-03	2.30E-02	1.63E-02							
Berries						4.24E-03	1.82E-02	5.57E-03							
Lichen									1.56E-05	1.87E-05	2.78E-05	1.87E-05	3.19E-05	1.87E-05	3.19E-05
Hare									3.02E-03						
Moose						1.10E-03	1.10E-03	1.10E-03	2.17E-04						
Caribou						7.86E-05	7.86E-05	7.86E-05		1.57E-03	3.58E-03	6.85E-03	1.05E-02	1.15E-03	8.11E-03
Ducks										6.50E-02	1.48E-01	2.83E-01	4.34E-01	4.77E-02	3.35E-01
Total	6.19E-02	1.88E-01	1.43E-01	1.20E-01	4.79E-01	2.42E-02	7.36E-02	4.39E-02	5.79E-03						

by Pathway

Lead	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.94E-04	3.57E-04	3.20E-04	5.57E-04	3.07E-04	1.75E-04	3.63E-04	6.58E-04	4.22E-04
Sediment	3.36E-02	6.20E-02	5.55E-02	9.67E-02	5.33E-02	3.04E-02	6.66E-03	8.45E-02	8.08E-01
Soil									
Fish									
Benthic									
Aquatic Veg	8.40E-03	1.55E-02	1.39E-02	2.42E-02	1.33E-02	7.61E-03	1.81E-04	9.50E-04	5.38E-03
Browse	2.19E-03	1.42E-01	2.19E-03	1.73E-02	2.19E-03	1.73E-02			
Forage									
Berries									
Lichen							3.72E-04	7.33E-03	6.05E-02
Hare									
Moose									
Caribou									
Ducks							1.42E-03	2.57E-03	1.65E-03
Total	4.44E-02	2.20E-01	7.18E-02	1.39E-01	6.91E-02	5.56E-02	8.99E-03	9.60E-02	8.76E-01

Manganese	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	3.24E-03	5.11E-02	1.54E-03	1.77E-03	1.01E-03	8.11E-03	1.19E-03	2.09E-03	6.03E-02
Sediment	3.37E-01	5.31E+00	1.60E-01	1.84E-01	1.05E-01	8.44E-01	5.78E-01	7.46E-01	4.24E-01
Soil									
Fish									
Benthic									
Aquatic Veg	1.59E-01	2.51E+00	7.55E-02	8.71E-02	4.96E-02	3.98E-01	2.80E-01	1.72E-01	2.00E-01
Browse	6.29E+00	2.45E+01	6.29E+00	5.80E+00	6.29E+00	5.80E+00			
Forage									
Berries									
Lichen							1.26E-03	1.26E-03	5.00E-04
Hare									
Moose									
Caribou									
Ducks							2.23E-03	3.91E-03	1.13E-01
Total	6.79E+00	3.24E+01	6.53E+00	6.08E+00	6.45E+00	7.05E+00	8.63E-01	9.25E-01	7.97E-01

Nickel	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	9.82E-05	2.24E-04	4.28E-04	6.57E-04	7.21E-05	5.06E-04	8.51E-05	7.75E-04	2.64E-04
Sediment	9.65E-03	2.20E-02	4.20E-02	6.45E-02	7.08E-03	4.97E-02	3.86E-03	1.02E-02	7.71E-03
Soil									
Fish									
Benthic									
Aquatic Veg	4.26E-04	9.70E-04	1.85E-03	2.85E-03	3.13E-04	2.19E-03	1.10E-03	4.75E-03	1.45E-03
Browse	2.42E-02	2.99E-02	2.42E-02	3.30E-02	2.42E-02	3.30E-02			
Forage									
Berries									
Lichen							5.07E-05	8.61E-05	7.52E-05
Hare									
Moose									
Caribou									
Ducks							3.05E-03	2.78E-02	9.46E-03
Total	3.44E-02	5.31E-02	6.85E-02	1.01E-01	3.17E-02	8.55E-02	8.14E-03	4.36E-02	1.90E-02

by Pathway

Silver	Caribou	Hare					Moose	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	1.24E-05	9.29E-06	1.87E-05	2.76E-05	2.76E-05	2.76E-05	1.43E-05	3.18E-05	7.54E-06	1.51E-05	2.24E-05	2.24E-05	2.24E-05
Sediment							5.56E-05						
Soil	1.46E-03	4.60E-03	4.07E-03	4.07E-03	9.63E-03	4.07E-03		1.61E-03	4.28E-03	3.79E-03	3.79E-03	8.96E-03	3.79E-03
Fish													
Benthic													
Aquatic Veg							9.49E-04						
Browse	3.34E-05	6.10E-04	5.43E-03	5.00E-04	4.14E-03	2.23E-03	6.05E-04		9.87E-04	8.79E-03	8.09E-04	6.70E-03	3.61E-03
Forage	4.05E-06	4.05E-04	1.38E-03	1.20E-03	1.31E-03	5.00E-03		5.05E-04					
Berries									1.64E-04	2.62E-04	4.92E-04	5.14E-05	4.06E-04
Lichen	3.57E-03												
Hare													
Moose													
Caribou													
Ducks													
Total	5.08E-03	5.62E-03	1.09E-02	5.80E-03	1.51E-02	1.13E-02	1.62E-03	2.15E-03	5.44E-03	1.29E-02	5.11E-03	1.57E-02	7.83E-03

Thallium	Caribou	Hare					Moose	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment							n/a						
Soil	n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a
Fish													
Benthic													
Aquatic Veg							n/a						
Browse	7.82E-06	5.68E-04	7.52E-04	7.52E-04	7.52E-04	7.52E-04	1.42E-04		9.19E-04	1.22E-03	1.22E-03	1.22E-03	1.22E-03
Forage	4.11E-06	3.08E-04	3.72E-04	3.62E-04	3.61E-03	2.44E-04		1.84E-03					
Berries									7.35E-05	6.46E-05	5.57E-05	8.44E-05	7.76E-05
Lichen	1.59E-03												
Hare													
Moose													
Caribou													
Ducks													
Total	1.60E-03	8.77E-04	1.12E-03	1.11E-03	4.37E-03	9.96E-04	1.42E-04	1.84E-03	9.92E-04	1.28E-03	1.27E-03	1.30E-03	1.29E-03

Tin	Caribou	Hare					Moose	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment							n/a						
Soil	3.70E-03	1.02E-02	3.18E-02	1.66E-02	1.28E-02	1.57E-02		1.13E-02	9.47E-03	2.96E-02	1.54E-02	1.19E-02	1.46E-02
Fish													
Benthic													
Aquatic Veg							n/a						
Browse	9.98E-05	1.20E-02	2.01E-02	1.05E-02	8.09E-03	3.76E-03	1.81E-03		1.93E-02	3.25E-02	1.69E-02	1.31E-02	6.08E-03
Forage	2.02E-05	8.95E-03	1.86E-03	6.42E-03	1.89E-03	6.61E-03		7.29E-03					
Berries									6.08E-04	3.23E-04	3.09E-02	2.91E-03	3.88E-04
Lichen	1.85E-02												
Hare													
Moose													
Caribou													
Ducks													
Total	2.23E-02	3.11E-02	5.37E-02	3.34E-02	2.28E-02	2.61E-02	1.81E-03	1.86E-02	2.94E-02	6.24E-02	6.32E-02	2.79E-02	2.11E-02

by Pathway

Silver	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	2.87E-06	8.53E-06	2.26E-05	5.77E-06	2.87E-06	4.67E-06	2.59E-06	7.68E-06	2.04E-05	5.20E-06	2.59E-06	4.20E-06	3.17E-06	9.42E-06	2.50E-05	6.37E-06	3.17E-06	5.16E-06
Sediment	6.93E-05	2.06E-04	5.46E-04	1.39E-04	6.93E-05	1.13E-04	4.49E-05	1.33E-04	3.54E-04	9.02E-05	4.49E-05	7.30E-05	3.00E-04	8.92E-04	2.37E-03	6.04E-04	3.00E-04	4.89E-04
Soil																		
Fish							4.34E-03	1.29E-02	3.42E-02	8.72E-03	4.34E-03	7.05E-03						
Benthic	1.71E-03	5.09E-03	1.35E-02	3.44E-03	1.71E-03	2.79E-03							2.77E-03	8.22E-03	2.18E-02	5.56E-03	2.77E-03	4.50E-03
Aquatic Veg	2.89E-03	8.59E-03	2.28E-02	5.82E-03	2.89E-03	4.71E-03							1.40E-03	4.16E-03	1.10E-02	2.81E-03	1.40E-03	2.28E-03
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	4.68E-03	1.39E-02	3.69E-02	9.40E-03	4.68E-03	7.61E-03	4.38E-03	1.30E-02	3.46E-02	8.81E-03	4.38E-03	7.13E-03	4.47E-03	1.33E-02	3.53E-02	8.99E-03	4.47E-03	7.27E-03

Thallium	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Soil																		
Fish							n/a	n/a	n/a	n/a	n/a	n/a						
Benthic	n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a	n/a	n/a	n/a
Aquatic Veg	n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a	n/a	n/a	n/a
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Tin	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Soil																		
Fish							n/a	n/a	n/a	n/a	n/a	n/a						
Benthic	n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a	n/a	n/a	n/a
Aquatic Veg	n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a	n/a	n/a	n/a
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

by Pathway

Silver	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	8.44E-06	1.70E-05	2.51E-05	2.51E-05	2.51E-05	5.94E-06	1.19E-05	1.76E-05	4.67E-06	9.90E-06	2.94E-05	7.81E-05	1.99E-05	9.90E-06	1.61E-05
Sediment										1.94E-04	5.75E-04	1.53E-03	3.89E-04	1.94E-04	3.15E-04
Soil	2.06E-03	1.82E-03	1.82E-03	4.31E-03	1.82E-03	1.57E-03	1.39E-03	2.59E-03	3.44E-04						
Fish						4.82E-04	9.68E-04	1.43E-03		4.95E-03	1.47E-02	3.90E-02	9.95E-03	4.95E-03	8.05E-03
Benthic										3.96E-04	1.18E-03	3.12E-03	7.96E-04	3.96E-04	6.44E-04
Aquatic Veg										1.10E-03	3.27E-03	8.68E-03	2.21E-03	1.10E-03	1.79E-03
Browse															
Forage	8.63E-04	2.95E-03	2.56E-03	2.79E-03	1.07E-02	1.52E-04	4.65E-04	3.64E-04							
Berries						1.62E-04	1.37E-04	4.60E-05							
Lichen															
Hare									2.49E-07	2.60E-07	6.98E-07	2.60E-07	5.04E-07	2.60E-07	5.04E-07
Moose						1.36E-05	1.36E-05	1.36E-05	3.74E-05						
Caribou						7.43E-06	7.43E-06	7.43E-06	2.05E-05						
Ducks										1.11E-04	3.30E-04	8.77E-04	2.24E-04	1.11E-04	1.81E-04
Total	2.93E-03	4.79E-03	4.41E-03	7.12E-03	1.25E-02	2.40E-03	3.00E-03	4.47E-03	4.06E-04	6.76E-03	2.01E-02	5.33E-02	1.36E-02	6.76E-03	1.10E-02

Thallium	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment										n/a	n/a	n/a	n/a	n/a	n/a
Soil	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a						
Fish						n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a
Benthic										n/a	n/a	n/a	n/a	n/a	n/a
Aquatic Veg										n/a	n/a	n/a	n/a	n/a	n/a
Browse															
Forage	6.58E-04	7.94E-04	7.72E-04	7.71E-03	5.20E-04	1.16E-04	2.13E-04	1.10E-03							
Berries						7.27E-05	1.27E-04	7.55E-05							
Lichen															
Hare									4.33E-07	4.05E-07	2.02E-06	4.05E-07	5.19E-07	4.05E-07	5.19E-07
Moose						1.18E-05	1.18E-05	1.18E-05	3.26E-05						
Caribou						2.34E-05	2.34E-05	2.34E-05	6.44E-05						
Ducks										n/a	n/a	n/a	n/a	n/a	n/a
Total	6.58E-04	7.94E-04	7.72E-04	7.71E-03	5.20E-04	2.24E-04	3.75E-04	1.21E-03	9.75E-05	4.05E-07	2.02E-06	4.05E-07	5.19E-07	4.05E-07	5.19E-07

Tin	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment										n/a	n/a	n/a	n/a	n/a	n/a
Soil	4.56E-03	1.42E-02	7.41E-03	5.73E-03	7.04E-03	3.48E-03	7.00E-03	4.99E-03	8.70E-04						
Fish						n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a
Benthic										n/a	n/a	n/a	n/a	n/a	n/a
Aquatic Veg										n/a	n/a	n/a	n/a	n/a	n/a
Browse															
Forage	1.91E-02	3.97E-03	1.37E-02	4.03E-03	1.41E-02	3.37E-03	1.06E-03	8.08E-04							
Berries						6.01E-04	6.36E-04	1.53E-03							
Lichen															
Hare									8.53E-06	1.44E-05	1.05E-05	1.44E-05	2.48E-05	1.44E-05	2.48E-05
Moose						1.51E-04	1.51E-04	1.51E-04	4.16E-04						
Caribou						3.26E-04	3.26E-04	3.26E-04	8.99E-04						
Ducks										n/a	n/a	n/a	n/a	n/a	n/a
Total	2.37E-02	1.82E-02	2.11E-02	9.76E-03	2.12E-02	7.93E-03	9.17E-03	7.81E-03	2.19E-03	1.44E-05	1.05E-05	1.44E-05	2.48E-05	1.44E-05	2.48E-05

by Pathway

Silver	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	7.21E-06	2.14E-05	5.69E-05	1.45E-05	7.21E-06	1.17E-05	8.51E-06	1.71E-05	2.53E-05
Sediment	3.67E-05	1.09E-04	2.89E-04	7.37E-05	3.67E-05	5.96E-05			
Soil							6.53E-04	5.78E-04	1.07E-03
Fish									
Benthic									
Aquatic Veg	2.08E-03	6.19E-03	1.64E-02	4.19E-03	2.08E-03	3.39E-03			
Browse	9.69E-05	4.97E-04	9.69E-05	6.84E-04	9.69E-05	6.84E-04			
Forage									
Berries							4.22E-05	3.56E-05	1.20E-05
Lichen									
Hare							7.02E-07	1.36E-06	1.88E-06
Moose									
Caribou									
Ducks							2.93E-04	5.90E-04	8.72E-04
Total	2.22E-03	6.81E-03	1.69E-02	4.96E-03	2.22E-03	4.14E-03	9.98E-04	1.22E-03	1.98E-03

Thallium	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a			
Soil							n/a	n/a	n/a
Fish									
Benthic									
Aquatic Veg	n/a	n/a	n/a	n/a	n/a	n/a			
Browse	9.02E-05	9.29E-05	9.02E-05	1.19E-04	9.02E-05	1.19E-04			
Forage									
Berries							1.89E-05	3.32E-05	1.97E-05
Lichen									
Hare							1.09E-06	1.40E-06	5.45E-06
Moose									
Caribou									
Ducks							n/a	n/a	n/a
Total	9.02E-05	9.29E-05	9.02E-05	1.19E-04	9.02E-05	1.19E-04	2.00E-05	3.46E-05	2.51E-05

Tin	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a			
Soil							1.44E-03	2.90E-03	2.07E-03
Fish									
Benthic									
Aquatic Veg	n/a	n/a	n/a	n/a	n/a	n/a			
Browse	1.90E-03	4.79E-03	1.90E-03	2.05E-03	1.90E-03	2.05E-03			
Forage									
Berries							1.57E-04	1.66E-04	3.98E-04
Lichen									
Hare							3.88E-05	6.71E-05	2.84E-05
Moose									
Caribou									
Ducks							n/a	n/a	n/a
Total	1.90E-03	4.79E-03	1.90E-03	2.05E-03	1.90E-03	2.05E-03	1.64E-03	3.13E-03	2.50E-03

by Pathway

Zinc	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	2.10E-03	7.77E-04	1.25E-02	3.66E-03	3.66E-03	3.66E-03	2.42E-03	4.96E-03	6.30E-04	1.02E-02	2.97E-03	2.97E-03	2.97E-03
Sediment							8.44E-02						
Soil	5.63E-01	6.50E-01	1.83E+00	1.00E+00	5.02E+00	2.99E+00		2.73E-01	6.05E-01	1.70E+00	9.35E-01	4.68E+00	2.78E+00
Fish													
Benthic													
Aquatic Veg							2.08E-01						
Browse	2.66E-01	1.25E+01	8.38E+00	9.45E+00	3.23E+01	2.57E+01	4.82E+00		2.03E+01	1.35E+01	1.53E+01	5.23E+01	4.16E+01
Forage	1.30E-02	1.44E+00	1.30E+01	2.00E+00	4.61E+00	2.48E+00		1.49E+00					
Berries									9.39E-02	1.48E-01	8.12E-02	2.44E-01	2.49E-01
Lichen	2.13E+00												
Hare													
Moose													
Caribou													
Ducks													
Total	2.97E+00	1.46E+01	2.32E+01	1.25E+01	4.20E+01	3.12E+01	5.12E+00	1.77E+00	2.10E+01	1.54E+01	1.63E+01	5.72E+01	4.46E+01

by Pathway

Zinc	Mallard						Merganser						Scaup					
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.29E-03	1.13E-03	5.62E-04	3.87E-03	2.40E-04	9.07E-04	1.16E-03	1.02E-03	5.06E-04	3.48E-03	2.16E-04	8.17E-04	1.43E-03	1.25E-03	6.21E-04	4.27E-03	2.65E-04	1.00E-03
Sediment	2.80E-01	2.45E-01	1.22E-01	8.38E-01	5.20E-02	1.97E-01	1.81E-01	1.59E-01	7.89E-02	5.43E-01	3.37E-02	1.27E-01	1.21E+00	1.06E+00	5.28E-01	3.63E+00	2.26E-01	8.53E-01
Soil																		
Fish							6.06E+00	5.31E+00	2.64E+00	1.82E+01	1.13E+00	4.26E+00						
Benthic	1.04E+01	9.07E+00	4.50E+00	3.10E+01	1.93E+00	7.28E+00							1.67E+01	1.46E+01	7.28E+00	5.01E+01	3.11E+00	1.18E+01
Aquatic Veg	1.69E+00	1.48E+00	7.36E-01	5.07E+00	3.15E-01	1.19E+00							8.19E-01	7.17E-01	3.56E-01	2.45E+00	1.52E-01	5.75E-01
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	1.23E+01	1.08E+01	5.36E+00	3.69E+01	2.29E+00	8.66E+00	6.25E+00	5.47E+00	2.72E+00	1.87E+01	1.16E+00	4.39E+00	1.88E+01	1.64E+01	8.16E+00	5.62E+01	3.49E+00	1.32E+01

by Pathway

Zinc	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	7.06E-04	1.14E-02	3.33E-03	3.33E-03	3.33E-03	4.97E-04	8.00E-03	2.34E-03	7.89E-04	4.46E-03	3.90E-03	1.94E-03	1.33E-02	8.28E-04	3.13E-03
Sediment										7.82E-01	6.85E-01	3.40E-01	2.34E+00	1.45E-01	5.49E-01
Soil	2.91E-01	8.19E-01	4.50E-01	2.25E+00	1.34E+00	2.23E-01	4.56E-01	1.31E+00	1.32E-01						
Fish						1.25E-01	2.02E+00	5.89E-01		6.92E+00	6.05E+00	3.01E+00	2.07E+01	1.29E+00	4.86E+00
Benthic										2.39E+00	2.10E+00	1.04E+00	7.17E+00	4.45E-01	1.68E+00
Aquatic Veg										6.44E-01	5.63E-01	2.80E-01	1.93E+00	1.20E-01	4.52E-01
Browse															
Forage	3.07E+00	2.77E+01	4.27E+00	9.84E+00	5.29E+00	5.42E-01	4.26E+00	1.38E+00							
Berries						9.28E-02	1.66E-01	2.03E-01							
Lichen															
Hare									2.10E-02	2.25E-02	6.46E-02	2.25E-02	3.57E-02	2.25E-02	3.57E-02
Moose						1.43E+00	1.43E+00	1.43E+00	3.93E+00						
Caribou						1.45E-01	1.45E-01	1.45E-01	3.99E-01						
Ducks										9.73E-01	8.51E-01	4.23E-01	2.91E+00	1.81E-01	6.83E-01
Total	3.36E+00	2.86E+01	4.72E+00	1.21E+01	6.63E+00	2.55E+00	8.48E+00	5.05E+00	4.48E+00	1.17E+01	1.03E+01	5.12E+00	3.51E+01	2.20E+00	8.27E+00

by Pathway

Zinc	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	3.24E-03	2.84E-03	1.41E-03	9.71E-03	6.03E-04	2.28E-03	7.12E-04	1.15E-02	3.35E-03
Sediment	1.48E-01	1.30E-01	6.44E-02	4.44E-01	2.75E-02	1.04E-01			
Soil							9.23E-02	1.89E-01	5.44E-01
Fish									
Benthic									
Aquatic Veg	1.22E+00	1.07E+00	5.30E-01	3.65E+00	2.27E-01	8.56E-01			
Browse	1.99E+00	3.84E+00	1.99E+00	2.83E+00	1.99E+00	2.83E+00			
Forage									
Berries							2.42E-02	4.32E-02	5.29E-02
Lichen									
Hare							6.08E-02	9.66E-02	1.75E-01
Moose									
Caribou									
Ducks							4.77E-01	7.68E+00	2.25E+00
Total	3.36E+00	5.04E+00	2.59E+00	6.93E+00	2.24E+00	3.79E+00	6.55E-01	8.02E+00	3.02E+00

Pct by Pathway

Percent Intake by Pathway

Arsenic	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.47%	0.16%	1.18%	0.29%	0.06%	0.10%	0.94%	5.15%	0.09%	0.95%	0.18%	0.04%	0.08%
Sediment							37.57%						
Soil	26.24%	22.34%	57.39%	39.45%	39.42%	67.24%		7.14%	15.44%	53.03%	28.76%	31.42%	59.64%
Fish													
Benthic													
Aquatic Veg							0.31%						
Browse	1.97%	67.51%	25.23%	55.70%	48.49%	25.94%	61.18%		81.08%	40.51%	70.57%	67.17%	39.98%
Forage	0.13%	9.99%	16.20%	4.56%	12.03%	6.72%		87.71%					
Berries									3.38%	5.50%	0.49%	1.37%	0.30%
Lichen	71.19%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.25%	0.02%	0.07%	0.04%	0.01%	0.01%	0.03%	1.45%	0.01%	0.04%	0.03%	0.01%	0.00%
Sediment							0.54%						
Soil	22.27%	3.54%	2.48%	25.98%	4.30%	2.51%		22.31%	2.15%	1.48%	21.57%	2.58%	1.50%
Fish													
Benthic													
Aquatic Veg							40.94%						
Browse	28.35%	92.59%	94.61%	53.60%	92.91%	94.31%	58.49%		97.69%	97.87%	77.34%	97.08%	97.76%
Forage	0.24%	3.85%	2.83%	20.37%	2.78%	3.17%		76.24%					
Berries									0.16%	0.62%	1.06%	0.33%	0.74%
Lichen	48.89%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.12%	0.11%	0.08%	0.03%	0.02%	0.02%	0.16%	0.10%	0.08%	0.05%	0.02%	0.01%	0.02%
Sediment							36.24%						
Soil	34.78%	13.70%	25.33%	25.79%	46.92%	35.44%		4.45%	12.08%	19.64%	21.32%	40.53%	29.22%
Fish													
Benthic													
Aquatic Veg							1.58%						
Browse	2.99%	53.44%	53.07%	45.22%	36.65%	43.80%	62.02%		81.92%	71.50%	64.97%	55.01%	62.75%
Forage	0.44%	32.76%	21.52%	28.96%	16.42%	20.74%		95.45%					
Berries									5.91%	8.81%	13.69%	4.45%	8.01%
Lichen	61.67%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Percent Intake by Patl

Arsenic	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Sediment	4.68%	4.68%	4.68%	4.68%	4.68%	4.68%	37.32%	37.32%	37.32%	37.32%	37.32%	37.32%	11.66%	11.66%	11.66%	11.66%	11.66%	11.66%
Soil																		
Fish							62.47%	62.47%	62.47%	62.47%	62.47%	62.47%						
Benthic	95.20%	95.20%	95.20%	95.20%	95.20%	95.20%							88.30%	88.30%	88.30%	88.30%	88.30%	88.30%
Aquatic Veg	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%							0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sediment	0.33%	0.33%	0.33%	0.33%	0.33%	0.33%	6.62%	6.62%	6.62%	6.62%	6.62%	6.62%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%
Soil																		
Fish							93.29%	93.29%	93.29%	93.29%	93.29%	93.29%						
Benthic	38.26%	38.26%	38.26%	38.26%	38.26%	38.26%							66.51%	66.51%	66.51%	66.51%	66.51%	66.51%
Aquatic Veg	61.40%	61.40%	61.40%	61.40%	61.40%	61.40%							31.95%	31.95%	31.95%	31.95%	31.95%	31.95%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Sediment	30.45%	30.45%	30.45%	30.45%	30.45%	30.45%	22.98%	22.98%	22.98%	22.98%	22.98%	22.98%	54.87%	54.87%	54.87%	54.87%	54.87%	54.87%
Soil																		
Fish							77.00%	77.00%	77.00%	77.00%	77.00%	77.00%						
Benthic	66.28%	66.28%	66.28%	66.28%	66.28%	66.28%							44.47%	44.47%	44.47%	44.47%	44.47%	44.47%
Aquatic Veg	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%							0.65%	0.65%	0.65%	0.65%	0.65%	0.65%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Percent Intake by Patl

Arsenic	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.45%	1.75%	0.94%	0.13%	0.21%	0.56%	2.35%	0.25%	2.36%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%
Sediment										31.20%	31.19%	31.20%	31.20%	31.20%	31.20%
Soil	31.79%	41.87%	63.84%	40.67%	67.57%	42.67%	38.48%	63.45%	82.11%	13.82%	13.81%	13.82%	13.82%	13.82%	13.82%
Fish						8.12%	34.10%	3.71%		52.45%	52.45%	52.45%	52.45%	52.45%	52.45%
Benthic										0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
Aquatic Veg															
Browse															
Forage	67.76%	56.38%	35.22%	59.20%	32.21%	20.95%	17.85%	24.08%							
Berries						25.11%	6.72%	8.01%							
Lichen															
Hare									0.06%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%
Moose						1.99%	0.38%	0.38%	11.89%						
Caribou						0.60%	0.12%	0.11%	3.58%						
Ducks										2.30%	2.30%	2.30%	2.30%	2.30%	2.30%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.15%	0.85%	0.07%	0.13%	0.11%	0.30%	0.91%	0.24%	0.91%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
Sediment										2.46%	2.46%	2.45%	2.48%	2.40%	2.39%
Soil	16.11%	15.40%	21.09%	24.45%	14.22%	34.52%	24.51%	39.96%	50.90%	9.17%	9.16%	9.12%	9.26%	8.95%	8.90%
Fish						15.02%	45.87%	12.30%		23.62%	23.59%	23.49%	23.84%	23.05%	22.92%
Benthic										62.33%	62.25%	62.00%	62.91%	60.82%	60.50%
Aquatic Veg															
Browse															
Forage	83.74%	83.75%	78.84%	75.42%	85.67%	41.33%	19.82%	30.29%							
Berries						6.85%	6.94%	14.57%							
Lichen															
Hare									0.23%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%
Moose						1.66%	1.62%	2.20%	39.95%						
Caribou						0.33%	0.33%	0.44%	8.01%						
Ducks										2.39%	2.51%	2.91%	1.47%	4.75%	5.26%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.13%	0.12%	0.04%	0.03%	0.03%	0.20%	0.15%	0.05%	0.29%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
Sediment										47.81%	47.80%	47.81%	47.81%	47.81%	47.81%
Soil	8.05%	19.77%	15.73%	37.46%	26.37%	13.34%	19.53%	49.47%	50.13%	42.39%	42.38%	42.39%	42.39%	42.39%	42.39%
Fish						31.34%	23.73%	7.30%		8.61%	8.60%	8.61%	8.61%	8.61%	8.61%
Benthic										0.69%	0.69%	0.69%	0.69%	0.69%	0.69%
Aquatic Veg															
Browse															
Forage	91.82%	80.11%	84.24%	62.51%	73.60%	35.07%	25.69%	22.67%							
Berries						17.54%	28.86%	18.67%							
Lichen															
Hare									0.24%	0.02%	0.04%	0.01%	0.01%	0.01%	0.01%
Moose						2.10%	1.70%	1.54%	41.10%						
Caribou						0.42%	0.34%	0.31%	8.24%						
Ducks										0.44%	0.44%	0.44%	0.44%	0.44%	0.44%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Percent Intake by Patl

Arsenic							Fox		
Pathway	Beaver						Fox		
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.98%	0.58%	1.56%	1.68%	0.70%	1.29%	1.30%	1.92%	0.80%
Sediment	51.45%	30.70%	81.86%	88.52%	36.73%	67.82%			
Soil							28.68%	9.13%	57.80%
Fish									
Benthic									
Aquatic Veg	1.41%	0.84%	2.25%	2.43%	1.01%	1.86%			
Browse	46.16%	67.87%	14.34%	7.37%	61.56%	29.03%			
Forage									
Berries							10.61%	1.00%	4.59%
Lichen									
Hare							0.08%	0.01%	0.12%
Moose									
Caribou									
Ducks							59.34%	87.93%	36.70%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium							Fox		
Pathway	Beaver						Fox		
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.01%	0.01%	0.01%	0.02%	0.01%	0.01%	0.18%	0.62%	0.31%
Sediment	0.29%	0.31%	0.31%	0.35%	0.32%	0.29%			
Soil							6.15%	4.80%	14.77%
Fish									
Benthic									
Aquatic Veg	73.17%	77.46%	78.91%	87.52%	82.29%	72.84%			
Browse	26.53%	22.22%	20.76%	12.12%	17.37%	26.86%			
Forage									
Berries							0.77%	0.85%	3.39%
Lichen									
Hare							0.04%	0.06%	0.22%
Moose									
Caribou									
Ducks							92.86%	93.67%	81.31%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper							Fox		
Pathway	Beaver						Fox		
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.15%	0.14%	0.18%	0.20%	0.23%	0.22%	1.45%	0.94%	0.24%
Sediment	42.07%	39.04%	53.27%	56.99%	66.68%	63.16%			
Soil							28.50%	35.66%	74.06%
Fish									
Benthic									
Aquatic Veg	6.10%	5.66%	7.72%	8.26%	9.67%	9.16%			
Browse	51.68%	55.16%	38.82%	34.55%	23.42%	27.46%			
Forage									
Berries							23.55%	33.13%	17.57%
Lichen									
Hare							0.61%	0.55%	0.63%
Moose									
Caribou									
Ducks							45.90%	29.72%	7.50%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.01%	0.62%	0.06%	0.03%	0.00%	0.01%	0.13%	0.94%	0.48%	0.05%	0.02%	0.00%	0.01%
Sediment							16.99%						
Soil	32.73%	73.41%	80.06%	56.09%	78.85%	96.70%		70.14%	65.13%	80.74%	42.86%	77.96%	97.03%
Fish													
Benthic							1.27%						
Aquatic Veg							81.61%						
Browse	0.38%	21.63%	10.49%	42.72%	12.68%	1.64%			33.35%	18.38%	56.73%	21.78%	2.85%
Forage	0.05%	4.34%	9.39%	1.17%	8.46%	1.66%		28.92%					
Berries									1.05%	0.84%	0.39%	0.25%	0.11%
Lichen	66.82%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.22%	0.00%	0.00%	0.21%	0.27%	0.08%	0.09%	0.01%	0.00%	0.00%	0.22%	0.28%	0.06%
Sediment							7.09%						
Soil	23.88%	6.71%	9.29%	5.29%	6.22%	2.51%		5.72%	5.50%	7.61%	6.55%	7.29%	2.35%
Fish													
Benthic							1.00%						
Aquatic Veg							91.82%						
Browse	14.38%	65.23%	64.56%	36.77%	43.21%	58.86%			92.93%	91.91%	79.07%	87.96%	95.78%
Forage	1.97%	28.06%	26.14%	57.73%	50.29%	38.55%		94.27%					
Berries									1.58%	0.47%	14.16%	4.48%	1.81%
Lichen	59.54%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.77%	0.05%	0.25%	0.25%	0.10%	0.05%	0.36%	0.50%	0.03%	0.18%	0.30%	0.06%	0.04%
Sediment							27.34%						
Soil	38.91%	13.39%	28.35%	20.88%	18.10%	8.23%		1.66%	9.16%	23.33%	29.10%	13.26%	7.59%
Fish													
Benthic							0.36%						
Aquatic Veg							71.93%						
Browse	9.69%	75.11%	51.91%	25.85%	67.02%	53.89%			89.26%	74.21%	62.60%	85.35%	86.42%
Forage	0.84%	11.46%	19.49%	53.03%	14.79%	37.84%		97.84%					
Berries									1.55%	2.28%	8.00%	1.33%	5.95%
Lichen	49.79%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
Sediment	64.61%	64.61%	64.61%	64.61%	64.61%	64.61%	64.16%	64.16%	64.16%	64.16%	64.16%	64.16%	86.51%	86.51%	86.51%	86.51%	86.51%	86.51%
Soil																		
Fish							35.73%	35.73%	35.73%	35.73%	35.73%	35.73%						
Benthic	23.44%	23.44%	23.44%	23.44%	23.44%	23.44%							11.69%	11.69%	11.69%	11.69%	11.69%	11.69%
Aquatic Veg	11.88%	11.88%	11.88%	11.88%	11.88%	11.88%							1.77%	1.77%	1.77%	1.77%	1.77%	1.77%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
Sediment	13.52%	13.52%	13.52%	13.52%	13.52%	13.52%	27.19%	27.19%	27.19%	27.19%	27.19%	27.19%	30.39%	30.39%	30.39%	30.39%	30.39%	30.39%
Soil																		
Fish							72.73%	72.73%	72.73%	72.73%	72.73%	72.73%						
Benthic	81.75%	81.75%	81.75%	81.75%	81.75%	81.75%							68.42%	68.42%	68.42%	68.42%	68.42%	68.42%
Aquatic Veg	4.70%	4.70%	4.70%	4.70%	4.70%	4.70%							1.18%	1.18%	1.18%	1.18%	1.18%	1.18%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.13%	0.13%	0.13%	0.13%	0.13%	0.13%	0.18%	0.18%	0.18%	0.18%	0.18%	0.18%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
Sediment	59.71%	59.71%	59.71%	59.71%	59.71%	59.71%	58.94%	58.94%	58.94%	58.94%	58.94%	58.94%	80.48%	80.48%	80.48%	80.48%	80.48%	80.48%
Soil																		
Fish							40.89%	40.89%	40.89%	40.89%	40.89%	40.89%						
Benthic	38.22%	38.22%	38.22%	38.22%	38.22%	38.22%							19.19%	19.19%	19.19%	19.19%	19.19%	19.19%
Aquatic Veg	1.94%	1.94%	1.94%	1.94%	1.94%	1.94%							0.29%	0.29%	0.29%	0.29%	0.29%	0.29%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.32%	0.09%	0.09%	0.01%	0.02%	1.09%	0.18%	0.01%	0.04%	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%
Sediment										82.88%	78.48%	82.90%	82.57%	82.90%	81.79%
Soil	76.97%	64.07%	90.90%	66.14%	92.43%	68.89%	79.68%	88.09%	95.55%						
Fish						17.31%	2.86%	0.21%		12.21%	11.56%	12.21%	12.17%	12.21%	12.05%
Benthic										2.49%	2.35%	2.49%	2.48%	2.49%	2.45%
Aquatic Veg										2.07%	1.96%	2.07%	2.06%	2.07%	2.04%
Browse															
Forage	21.71%	35.84%	9.01%	33.85%	7.55%	4.48%	15.37%	10.70%							
Berries						2.97%	1.43%	0.93%							
Lichen															
Hare									2.42%	0.06%	5.37%	0.04%	0.44%	0.04%	1.38%
Moose						0.86%	0.08%	0.01%	0.32%						
Caribou						4.41%	0.40%	0.05%	1.67%						
Ducks										0.16%	0.15%	0.16%	0.16%	0.16%	0.16%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.00%	0.01%	0.15%	0.23%	0.08%	0.01%	0.01%	0.35%	1.20%	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%
Sediment										44.26%	44.27%	44.26%	44.26%	44.25%	44.26%
Soil	4.77%	6.94%	1.88%	2.52%	1.35%	15.61%	10.49%	8.61%	81.84%						
Fish						0.43%	0.39%	16.29%		31.33%	31.33%	31.32%	31.32%	31.32%	31.33%
Benthic										22.13%	22.13%	22.13%	22.13%	22.13%	22.13%
Aquatic Veg										2.09%	2.09%	2.09%	2.09%	2.09%	2.09%
Browse															
Forage	95.23%	93.06%	97.97%	97.25%	98.57%	71.79%	85.20%	68.16%							
Berries						12.02%	3.84%	6.47%							
Lichen															
Hare									0.10%	0.01%	0.00%	0.02%	0.02%	0.04%	0.00%
Moose						0.14%	0.07%	0.11%	15.88%						
Caribou						0.01%	0.00%	0.01%	0.98%						
Ducks										0.07%	0.07%	0.07%	0.07%	0.07%	0.07%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.14%	0.41%	0.18%	0.22%	0.05%	0.25%	0.73%	0.42%	1.35%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%
Sediment										78.45%	78.45%	78.46%	78.46%	78.44%	78.46%
Soil	19.66%	23.28%	7.61%	20.38%	4.36%	38.46%	33.39%	42.33%	42.46%						
Fish						2.76%	8.27%	4.72%		14.40%	14.40%	14.40%	14.40%	14.40%	14.40%
Benthic										4.15%	4.15%	4.15%	4.15%	4.15%	4.15%
Aquatic Veg										0.35%	0.35%	0.35%	0.35%	0.35%	0.35%
Browse															
Forage	80.20%	76.31%	92.20%	79.40%	95.59%	36.15%	31.26%	37.16%							
Berries						17.52%	24.75%	12.69%							
Lichen															
Hare									0.27%	0.03%	0.02%	0.01%	0.01%	0.04%	0.01%
Moose						4.53%	1.49%	2.50%	52.18%						
Caribou						0.33%	0.11%	0.18%	3.74%						
Ducks										2.42%	2.42%	2.42%	2.42%	2.42%	2.42%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.44%	0.16%	0.45%	0.40%	0.44%	0.32%	4.04%	0.69%	0.05%
Sediment	75.70%	28.21%	77.20%	69.67%	77.10%	54.76%	74.06%	88.01%	92.24%
Soil									
Fish									
Benthic									
Aquatic Veg	18.92%	7.05%	19.30%	17.42%	19.28%	13.69%	2.01%	0.99%	0.61%
Browse	4.94%	64.58%	3.06%	12.51%	3.18%	31.23%			
Forage									
Berries									
Lichen							4.14%	7.64%	6.91%
Hare									
Moose									
Caribou									
Ducks							15.75%	2.68%	0.19%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.05%	0.16%	0.02%	0.03%	0.02%	0.11%	0.14%	0.23%	7.56%
Sediment	4.96%	16.40%	2.45%	3.04%	1.63%	11.96%	67.02%	80.65%	53.14%
Soil									
Fish									
Benthic									
Aquatic Veg	2.34%	7.74%	1.16%	1.43%	0.77%	5.65%	32.44%	18.57%	25.11%
Browse	92.64%	75.70%	96.37%	95.50%	97.59%	82.27%			
Forage									
Berries									
Lichen							0.15%	0.14%	0.06%
Hare									
Moose									
Caribou									
Ducks							0.26%	0.42%	14.13%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.29%	0.42%	0.62%	0.65%	0.23%	0.59%	1.05%	1.78%	1.39%
Sediment	28.08%	41.44%	61.35%	63.86%	22.37%	58.20%	47.35%	23.40%	40.65%
Soil									
Fish									
Benthic									
Aquatic Veg	1.24%	1.83%	2.71%	2.82%	0.99%	2.57%	13.56%	10.90%	7.66%
Browse	70.39%	56.31%	35.32%	32.68%	76.42%	38.64%			
Forage									
Berries									
Lichen							0.62%	0.20%	0.40%
Hare									
Moose									
Caribou									
Ducks							37.42%	63.72%	49.90%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Silver	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.24%	0.17%	0.17%	0.48%	0.18%	0.24%	0.88%	1.48%	0.14%	0.12%	0.44%	0.14%	0.29%
Sediment							3.43%						
Soil	28.77%	81.79%	37.33%	70.19%	63.74%	35.92%		75.03%	78.70%	29.48%	74.12%	56.96%	48.39%
Fish													
Benthic							58.42%						
Aquatic Veg							37.27%						
Browse	0.66%	10.85%	49.82%	8.62%	27.42%	19.71%			18.15%	68.36%	15.82%	42.57%	46.13%
Forage	0.08%	7.19%	12.67%	20.71%	8.65%	44.13%		23.49%					
Berries									3.01%	2.04%	9.62%	0.33%	5.19%
Lichen	70.24%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water													
Sediment													
Soil													
Fish													
Benthic													
Aquatic Veg													
Browse	0.49%	64.82%	66.90%	67.54%	17.23%	75.52%	100.00%		92.59%	94.96%	95.62%	93.51%	94.00%
Forage	0.26%	35.18%	33.10%	32.46%	82.77%	24.48%		100.00%					
Berries									7.41%	5.04%	4.38%	6.49%	6.00%
Lichen	99.25%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Tin	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water													
Sediment													
Soil	16.58%	32.74%	59.17%	49.51%	56.21%	60.26%		60.77%	32.20%	47.43%	24.38%	42.70%	69.35%
Fish													
Benthic													
Aquatic Veg													
Browse	0.45%	38.46%	37.37%	31.27%	35.50%	14.41%	100.00%		65.73%	52.05%	26.75%	46.86%	28.81%
Forage	0.09%	28.80%	3.46%	19.21%	8.30%	25.33%		39.23%					
Berries									2.07%	0.52%	48.87%	10.44%	1.84%
Lichen	82.88%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Silver	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%
Sediment	1.48%	1.48%	1.48%	1.48%	1.48%	1.48%	1.02%	1.02%	1.02%	1.02%	1.02%	1.02%	6.72%	6.72%	6.72%	6.72%	6.72%	6.72%
Soil																		
Fish							98.92%	98.92%	98.92%	98.92%	98.92%	98.92%						
Benthic	36.61%	36.61%	36.61%	36.61%	36.61%	36.61%							61.91%	61.91%	61.91%	61.91%	61.91%	61.91%
Aquatic Veg	61.85%	61.85%	61.85%	61.85%	61.85%	61.85%							31.30%	31.30%	31.30%	31.30%	31.30%	31.30%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water																		
Sediment																		
Soil																		
Fish																		
Benthic																		
Aquatic Veg																		
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Tin	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water																		
Sediment																		
Soil																		
Fish																		
Benthic																		
Aquatic Veg																		
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Pct by Pathway

Silver	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.29%	0.35%	0.57%	0.35%	0.20%	0.25%	0.40%	0.39%	1.15%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%
Sediment										2.86%	2.86%	2.86%	2.86%	2.86%	2.86%
Soil	70.25%	38.05%	41.31%	60.49%	14.55%	65.68%	46.52%	57.94%	84.56%						
Fish						20.09%	32.31%	32.02%		73.21%	73.21%	73.21%	73.21%	73.21%	73.21%
Benthic										5.86%	5.86%	5.86%	5.86%	5.86%	5.86%
Aquatic Veg										16.28%	16.28%	16.28%	16.28%	16.28%	16.28%
Browse															
Forage	29.46%	61.60%	58.12%	39.15%	85.25%	6.35%	15.51%	8.15%							
Berries						6.75%	4.56%	1.03%							
Lichen															
Hare									0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Moose						0.57%	0.45%	0.30%	9.20%						
Caribou						0.31%	0.25%	0.17%	5.04%						
Ducks										1.65%	1.65%	1.65%	1.65%	1.65%	1.65%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water															
Sediment															
Soil															
Fish															
Benthic															
Aquatic Veg															
Browse															
Forage	100.00%	100.00%	100.00%	100.00%	100.00%	51.82%	56.71%	90.84%							
Berries						32.46%	33.91%	6.25%							
Lichen															
Hare									0.44%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Moose						5.29%	3.15%	0.98%	33.46%						
Caribou						10.44%	6.23%	1.93%	66.09%						
Ducks															
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Tin	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water															
Sediment															
Soil	19.25%	78.18%	35.08%	58.69%	33.28%	43.94%	76.27%	63.96%	39.65%						
Fish															
Benthic															
Aquatic Veg															
Browse															
Forage	80.75%	21.82%	64.92%	41.31%	66.72%	42.47%	11.60%	10.35%							
Berries						7.57%	6.93%	19.57%							
Lichen															
Hare									0.39%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Moose						1.90%	1.65%	1.93%	18.97%						
Caribou						4.11%	3.56%	4.18%	40.99%						
Ducks															
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Silver	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.32%	0.31%	0.34%	0.29%	0.32%	0.28%	0.85%	1.40%	1.27%
Sediment	1.65%	1.60%	1.71%	1.49%	1.65%	1.44%			
Soil							65.43%	47.29%	54.10%
Fish									
Benthic									
Aquatic Veg	93.67%	90.80%	97.38%	84.44%	93.67%	81.78%			
Browse	4.36%	7.29%	0.57%	13.78%	4.36%	16.50%			
Forage							4.23%	2.92%	0.60%
Berries									
Lichen							0.07%	0.11%	0.09%
Hare									
Moose									
Caribou									
Ducks							29.42%	48.28%	43.93%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water									
Sediment									
Soil									
Fish									
Benthic									
Aquatic Veg									
Browse	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			
Forage							94.54%	95.94%	78.31%
Berries									
Lichen							5.46%	4.06%	21.69%
Hare									
Moose									
Caribou									
Ducks									
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Tin	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water									
Sediment									
Soil							88.09%	92.57%	82.91%
Fish									
Benthic									
Aquatic Veg									
Browse	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			
Forage							9.54%	5.29%	15.95%
Berries									
Lichen							2.37%	2.14%	1.14%
Hare									
Moose									
Caribou									
Ducks									
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.07%	0.01%	0.05%	0.03%	0.01%	0.01%	0.05%	0.28%	0.00%	0.07%	0.02%	0.01%	0.01%
Sediment							1.65%						
Soil	18.95%	4.45%	7.89%	8.06%	11.98%	9.59%		15.44%	2.89%	11.06%	5.73%	8.18%	6.24%
Fish													
Benthic													
Aquatic Veg							4.07%						
Browse	8.96%	85.70%	36.08%	75.85%	77.03%	82.45%	94.23%		96.66%	87.91%	93.75%	91.39%	93.20%
Forage	0.44%	9.85%	55.97%	16.06%	10.99%	7.94%		84.28%					
Berries									0.45%	0.96%	0.50%	0.43%	0.56%
Lichen	71.59%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Sediment	2.27%	2.27%	2.27%	2.27%	2.27%	2.27%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	6.47%	6.47%	6.47%	6.47%	6.47%	6.47%
Soil																		
Fish							97.08%	97.08%	97.08%	97.08%	97.08%	97.08%						
Benthic	83.99%	83.99%	83.99%	83.99%	83.99%	83.99%							89.16%	89.16%	89.16%	89.16%	89.16%	89.16%
Aquatic Veg	13.73%	13.73%	13.73%	13.73%	13.73%	13.73%							4.36%	4.36%	4.36%	4.36%	4.36%	4.36%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.02%	0.04%	0.07%	0.03%	0.05%	0.02%	0.09%	0.05%	0.02%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
Sediment										6.66%	6.63%	6.65%	6.67%	6.61%	6.65%
Soil	8.65%	2.87%	9.52%	18.60%	20.20%	8.72%	5.38%	25.99%	2.95%						
Fish						4.90%	23.79%	11.67%		58.94%	58.68%	58.79%	58.99%	58.45%	58.79%
Benthic										20.40%	20.31%	20.35%	20.42%	20.23%	20.35%
Aquatic Veg										5.48%	5.46%	5.47%	5.49%	5.44%	5.47%
Browse															
Forage	91.33%	97.09%	90.41%	81.37%	79.75%	21.22%	50.25%	27.22%							
Berries						3.63%	1.95%	4.01%							
Lichen															
Hare									0.47%	0.19%	0.63%	0.44%	0.10%	1.02%	0.43%
Moose						55.83%	16.81%	28.20%	87.65%						
Caribou						5.67%	1.71%	2.87%	8.91%						
Ducks										8.29%	8.25%	8.27%	8.29%	8.22%	8.27%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.10%	0.06%	0.05%	0.14%	0.03%	0.06%	0.11%	0.14%	0.11%
Sediment	4.41%	2.57%	2.49%	6.40%	1.23%	2.74%			
Soil							14.09%	2.36%	18.02%
Fish									
Benthic									
Aquatic Veg	36.28%	21.17%	20.50%	52.63%	10.10%	22.57%			
Browse	59.21%	76.20%	76.95%	40.84%	88.65%	74.63%			
Forage									
Berries							3.69%	0.54%	1.75%
Lichen									
Hare							9.29%	1.20%	5.78%
Moose									
Caribou									
Ducks							72.83%	95.76%	74.34%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

APPENDIX F-2

NO INTERVENTION FUTURE 1 SCENARIO

**(SUMMARY TERRESTRIAL ECOLOGICAL
RECEPTOR RESULTS)**

by Pathway

Intake by Pathway (mg/kg d)

Pathway	Caribou Overall	Hare					Moose Overall	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	2.79E-04	5.35E-05	9.47E-04	1.76E-03	1.76E-03	1.76E-03	3.22E-04	5.05E-04	4.35E-05	7.69E-04	1.43E-03	1.43E-03	1.43E-03
Sediment							1.29E-02						
Soil	9.88E-03	7.64E-03	5.69E-02	1.77E-02	8.22E-02	8.27E-02		8.07E-04	7.11E-03	5.29E-02	1.65E-02	7.65E-02	7.69E-02
Fish													
Benthic													
Aquatic Veg							1.06E-04						
Browse	7.40E-04	2.31E-02	2.50E-02	2.50E-02	1.01E-01	3.19E-02	1.34E-02		3.73E-02	4.04E-02	4.04E-02	1.64E-01	5.16E-02
Forage	4.76E-05	3.41E-03	1.61E-02	2.05E-03	2.51E-02	8.26E-03		9.92E-03					
Berries									1.56E-03	5.49E-03	2.79E-04	3.33E-03	3.88E-04
Lichen													
Hare	2.68E-02												
Moose													
Caribou													
Ducks													
Total	3.77E-02	3.42E-02	9.89E-02	4.65E-02	2.10E-01	1.25E-01	2.67E-02	1.12E-02	4.60E-02	9.96E-02	5.86E-02	2.45E-01	1.30E-01

Pathway	Caribou Overall	Hare					Moose Overall	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	1.69E-04	4.64E-05	1.33E-03	5.78E-04	5.78E-04	5.78E-04	1.94E-04	4.74E-04	3.77E-05	1.08E-03	4.69E-04	4.69E-04	4.69E-04
Sediment							3.21E-03						
Soil	2.46E-03	1.00E-02	5.30E-03	1.75E-02	1.08E-02	7.79E-03		9.69E-04	9.35E-03	4.93E-03	1.62E-02	1.00E-02	7.25E-03
Fish													
Benthic													
Aquatic Veg							2.44E-01						
Browse	3.14E-03	2.63E-01	2.02E-01	3.60E-02	2.33E-01	2.93E-01	5.68E-02		4.25E-01	3.26E-01	5.82E-02	3.77E-01	4.74E-01
Forage	2.66E-05	1.09E-02	6.05E-03	1.37E-02	6.97E-03	9.84E-03		3.31E-03					
Berries									6.90E-04	2.07E-03	7.99E-04	1.28E-03	3.59E-03
Lichen													
Hare	5.41E-03												
Moose													
Caribou													
Ducks													
Total	1.12E-02	2.84E-01	2.15E-01	6.77E-02	2.51E-01	3.11E-01	3.04E-01	4.75E-03	4.35E-01	3.35E-01	7.58E-02	3.89E-01	4.85E-01

Pathway	Caribou Overall	Hare					Moose Overall	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	2.40E-03	4.63E-04	1.06E-02	1.74E-02	1.74E-02	1.74E-02	2.77E-03	3.76E-03	3.76E-04	8.64E-03	1.42E-02	1.42E-02	1.42E-02
Sediment							6.11E-01						
Soil	4.54E-02	5.89E-02	1.43E-01	1.29E-01	4.06E-01	2.34E-01		9.69E-03	5.48E-02	1.33E-01	1.20E-01	3.78E-01	2.18E-01
Fish													
Benthic													
Aquatic Veg							2.66E-02						
Browse	3.90E-03	2.30E-01	2.99E-01	2.27E-01	3.17E-01	2.89E-01	7.07E-02		3.71E-01	4.83E-01	3.66E-01	5.13E-01	4.68E-01
Forage	5.77E-04	1.41E-01	1.21E-01	1.45E-01	1.42E-01	1.37E-01		2.08E-01					
Berries									2.68E-02	5.95E-02	7.72E-02	4.15E-02	5.98E-02
Lichen													
Hare	8.05E-02												
Moose													
Caribou													
Ducks													
Total	1.33E-01	4.30E-01	5.73E-01	5.18E-01	8.83E-01	6.78E-01	7.11E-01	2.21E-01	4.53E-01	6.84E-01	5.78E-01	9.47E-01	7.60E-01

by Pathway

Intake by Pathway (m)

Pathway	Mallard						Merganser						Scaup					
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	3.09E-05	5.43E-04	1.58E-04	2.93E-04	1.66E-05	2.05E-05	2.78E-05	4.89E-04	1.43E-04	2.64E-04	1.49E-05	1.84E-05	3.41E-05	6.00E-04	1.75E-04	3.23E-04	1.83E-05	2.26E-05
Sediment	7.71E-03	1.35E-01	3.95E-02	7.31E-02	4.13E-03	5.11E-03	5.00E-03	8.78E-02	2.56E-02	4.74E-02	2.68E-03	3.31E-03	3.35E-02	5.88E-01	1.71E-01	3.17E-01	1.79E-02	2.21E-02
Soil																		
Fish							8.37E-03	1.47E-01	4.29E-02	7.93E-02	4.48E-03	5.54E-03						
Benthic	1.57E-01	2.75E+00	8.03E-01	1.49E+00	8.40E-02	1.04E-01							2.53E-01	4.45E+00	1.30E+00	2.40E+00	1.36E-01	1.68E-01
Aquatic Veg	1.56E-04	2.74E-03	7.98E-04	1.48E-03	8.34E-05	1.03E-04							7.54E-05	1.32E-03	3.86E-04	7.14E-04	4.03E-05	4.99E-05
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	1.65E-01	2.89E+00	8.44E-01	1.56E+00	8.82E-02	1.09E-01	1.34E-02	2.35E-01	6.86E-02	1.27E-01	7.17E-03	8.87E-03	2.87E-01	5.04E+00	1.47E+00	2.72E+00	1.54E-01	1.90E-01

Pathway	Mallard						Merganser						Scaup					
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	8.35E-06	1.79E-04	1.15E-05	4.12E-04	1.44E-05	1.67E-05	7.52E-06	1.61E-04	1.04E-05	3.71E-04	1.29E-05	1.50E-05	9.23E-06	1.97E-04	1.27E-05	4.55E-04	1.59E-05	1.84E-05
Sediment	8.59E-04	1.84E-02	1.18E-03	4.24E-02	1.48E-03	1.71E-03	5.57E-04	1.19E-02	7.67E-04	2.75E-02	9.57E-04	1.11E-03	3.73E-03	7.97E-02	5.13E-03	1.84E-01	6.40E-03	7.44E-03
Soil																		
Fish							7.84E-03	1.68E-01	1.08E-02	3.87E-01	1.35E-02	1.57E-02						
Benthic	9.97E-02	2.13E+00	1.37E-01	4.92E+00	1.71E-01	1.99E-01							1.61E-01	3.45E+00	2.22E-01	7.95E+00	2.77E-01	3.21E-01
Aquatic Veg	1.60E-01	3.42E+00	2.20E-01	7.89E+00	2.75E-01	3.19E-01							7.74E-02	1.66E+00	1.07E-01	3.82E+00	1.33E-01	1.54E-01
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	2.61E-01	5.57E+00	3.59E-01	1.29E+01	4.48E-01	5.20E-01	8.41E-03	1.80E-01	1.16E-02	4.15E-01	1.44E-02	1.68E-02	2.42E-01	5.18E+00	3.34E-01	1.19E+01	4.16E-01	4.83E-01

Pathway	Mallard						Merganser						Scaup					
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	4.09E-05	5.39E-03	6.89E-05	3.29E-03	1.43E-04	2.14E-04	3.68E-05	4.86E-03	6.21E-05	2.96E-03	1.29E-04	1.93E-04	4.52E-05	5.96E-03	7.62E-05	3.64E-03	1.58E-04	2.36E-04
Sediment	5.61E-02	7.39E+00	9.45E-02	4.51E+00	1.96E-01	2.93E-01	3.64E-02	4.79E+00	6.13E-02	2.93E+00	1.27E-01	1.90E-01	2.43E-01	3.21E+01	4.10E-01	1.96E+01	8.51E-01	1.27E+00
Soil																		
Fish							1.22E-01	1.61E+01	2.05E-01	9.80E+00	4.26E-01	6.37E-01						
Benthic	1.22E-01	1.61E+01	2.06E-01	9.82E+00	4.27E-01	6.39E-01							1.97E-01	2.60E+01	3.32E-01	1.59E+01	6.90E-01	1.03E+00
Aquatic Veg	5.98E-03	7.88E-01	1.01E-02	4.81E-01	2.09E-02	3.13E-02							2.89E-03	3.81E-01	4.87E-03	2.33E-01	1.01E-02	1.51E-02
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	1.84E-01	2.43E+01	3.10E-01	1.48E+01	6.44E-01	9.64E-01	1.58E-01	2.09E+01	2.67E-01	1.27E+01	5.53E-01	8.28E-01	4.43E-01	5.85E+01	7.47E-01	3.57E+01	1.55E+00	2.32E+00

by Pathway

Intake by Pathway (m)

Arsenic	Hoary Marmot					Bear			Wolf	Mink					
	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	4.87E-05	8.61E-04	1.60E-03	1.60E-03	1.60E-03	3.42E-05	6.06E-04	1.12E-03	1.05E-04	1.07E-04	1.87E-03	5.46E-04	1.01E-03	5.71E-05	7.06E-05
Sediment										2.16E-02	3.79E-01	1.10E-01	2.04E-01	1.15E-02	1.43E-02
Soil	3.42E-03	2.55E-02	7.93E-03	3.68E-02	3.70E-02	2.61E-03	1.23E-02	2.05E-02	2.32E-03						
Fish						4.98E-04	8.81E-03	1.63E-02		9.55E-03	1.68E-01	4.89E-02	9.04E-02	5.11E-03	6.32E-03
Benthic										3.63E-02	6.36E-01	1.86E-01	3.43E-01	1.94E-02	2.40E-02
Aquatic Veg										5.92E-05	1.04E-03	3.03E-04	5.61E-04	3.17E-05	3.92E-05
Browse															
Forage	7.28E-03	3.43E-02	4.37E-03	5.36E-02	1.76E-02	1.28E-03	5.69E-03	7.79E-03							
Berries						1.54E-03	2.14E-03	2.59E-03							
Lichen									1.75E-06	1.05E-06	6.47E-06	1.05E-06	3.05E-06	1.05E-06	3.05E-06
Hare									4.10E-04						
Moose						1.49E-04	1.49E-04	1.49E-04	1.01E-04						
Caribou						3.68E-05	3.68E-05	3.68E-05							
Ducks										1.59E-03	2.79E-02	8.13E-03	1.50E-02	8.50E-04	1.05E-03
Total	1.08E-02	6.06E-02	1.39E-02	9.20E-02	5.62E-02	6.15E-03	2.97E-02	4.85E-02	2.94E-03	6.91E-02	1.21E+00	3.54E-01	6.55E-01	3.70E-02	4.57E-02

Cadmium	Hoary Marmot					Bear			Wolf	Mink					
	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	4.22E-05	1.21E-03	5.26E-04	5.26E-04	5.26E-04	2.97E-05	8.52E-04	3.70E-04	6.33E-05	2.88E-05	6.16E-04	3.97E-05	1.42E-03	4.95E-05	5.75E-05
Sediment										2.40E-03	5.14E-02	3.31E-03	1.18E-01	4.13E-03	4.79E-03
Soil	4.50E-03	2.37E-03	7.81E-03	4.82E-03	3.49E-03	3.44E-03	2.49E-03	3.00E-03	5.79E-04						
Fish						1.50E-03	4.30E-02	1.86E-02		8.95E-03	1.91E-01	1.23E-02	4.41E-01	1.54E-02	1.79E-02
Benthic										2.30E-02	4.93E-01	3.18E-02	1.14E+00	3.96E-02	4.60E-02
Aquatic Veg										6.08E-02	1.30E+00	8.38E-02	3.00E+00	1.05E-01	1.21E-01
Browse															
Forage	2.34E-02	1.29E-02	2.92E-02	1.49E-02	2.10E-02	4.12E-03	2.01E-03	2.27E-03							
Berries						6.82E-04	7.04E-04	1.09E-03							
Lichen									2.73E-06	3.44E-06	7.07E-06	3.44E-06	4.59E-06	3.44E-06	4.59E-06
Hare									2.84E-03						
Moose						1.03E-03	1.03E-03	1.03E-03	9.27E-05						
Caribou						3.36E-05	3.36E-05	3.36E-05							
Ducks										2.33E-03	3.07E-01	3.93E-03	1.88E-01	8.16E-03	1.22E-02
Total	2.79E-02	1.65E-02	3.75E-02	2.02E-02	2.50E-02	1.08E-02	5.01E-02	2.64E-02	3.58E-03	9.76E-02	2.35E+00	1.35E-01	4.89E+00	1.72E-01	2.02E-01

Copper	Hoary Marmot					Bear			Wolf	Mink					
	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	4.21E-04	9.68E-03	1.59E-02	1.59E-02	1.59E-02	2.96E-04	6.81E-03	1.12E-02	9.02E-04	1.41E-04	1.86E-02	2.38E-04	1.14E-02	4.93E-04	7.38E-04
Sediment										1.57E-01	2.07E+01	2.64E-01	1.26E+01	5.48E-01	8.20E-01
Soil	2.63E-02	6.38E-02	5.78E-02	1.82E-01	1.05E-01	2.01E-02	3.64E-02	1.02E-01	1.07E-02						
Fish						4.73E-02	1.09E+00	1.78E+00		1.39E-01	1.83E+01	2.34E-01	1.12E+01	4.86E-01	7.27E-01
Benthic										2.82E-02	3.72E+00	4.76E-02	2.27E+00	9.87E-02	1.48E-01
Aquatic Veg										2.27E-03	3.00E-01	3.83E-03	1.83E-01	7.95E-03	1.19E-02
Browse															
Forage	3.00E-01	2.58E-01	3.10E-01	3.03E-01	2.93E-01	5.30E-02	4.79E-02	4.67E-02							
Berries						2.65E-02	5.38E-02	3.84E-02							
Lichen									5.24E-05	6.62E-05	1.36E-04	6.62E-05	8.82E-05	6.62E-05	8.82E-05
Hare									5.46E-02						
Moose						1.98E-02	1.98E-02	1.98E-02	1.78E-03						
Caribou						6.47E-04	6.47E-04	6.47E-04							
Ducks										1.46E-03	1.92E-01	2.46E-03	1.17E-01	5.10E-03	7.63E-03
Total	3.27E-01	3.32E-01	3.83E-01	5.01E-01	4.13E-01	1.68E-01	1.25E+00	2.00E+00	6.80E-02	3.28E-01	4.32E+01	5.53E-01	2.64E+01	1.15E+00	1.72E+00

by Pathway

Intake by Pathway (m)

Pathway	Beaver						Fox		
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	7.76E-05	1.36E-03	3.98E-04	7.35E-04	4.16E-05	5.14E-05	4.91E-05	8.68E-04	1.61E-03
Sediment	4.08E-03	7.17E-02	2.09E-02	3.87E-02	2.19E-03	2.70E-03			
Soil							1.08E-03	5.08E-03	8.51E-03
Fish									
Benthic									
Aquatic Veg	1.12E-04	1.97E-03	5.75E-04	1.06E-03	6.01E-05	7.43E-05			
Browse	3.66E-03	1.16E-02	3.66E-03	3.97E-03	3.66E-03	3.97E-03			
Forage									
Berries							4.01E-04	5.58E-04	6.75E-04
Lichen									
Hare							2.84E-06	8.23E-06	1.75E-05
Moose									
Caribou									
Ducks							2.24E-03	3.97E-02	7.35E-02
Total	7.94E-03	8.67E-02	2.56E-02	4.45E-02	5.95E-03	6.80E-03	3.78E-03	4.62E-02	8.43E-02

Pathway	Beaver						Fox		
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	2.10E-05	4.49E-04	2.89E-05	1.03E-03	3.60E-05	4.19E-05	4.26E-05	1.22E-03	5.30E-04
Sediment	4.55E-04	9.73E-03	6.27E-04	2.24E-02	7.81E-04	9.07E-04			
Soil							1.43E-03	1.03E-03	1.24E-03
Fish									
Benthic									
Aquatic Veg	1.15E-01	2.46E+00	1.59E-01	5.68E+00	1.98E-01	2.30E-01			
Browse	4.18E-02	3.50E-02	4.18E-02	8.53E-02	4.18E-02	8.53E-02			
Forage									
Berries							1.78E-04	1.84E-04	2.85E-04
Lichen									
Hare							9.30E-06	1.24E-05	1.91E-05
Moose									
Caribou									
Ducks							2.15E-02	4.95E-01	8.11E-01
Total	1.57E-01	2.51E+00	2.01E-01	5.79E+00	2.41E-01	3.16E-01	2.32E-02	4.98E-01	8.13E-01

Pathway	Beaver						Fox		
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.03E-04	1.35E-02	1.73E-04	8.27E-03	3.59E-04	5.37E-04	4.24E-04	9.76E-03	1.60E-02
Sediment	2.97E-02	3.91E+00	5.00E-02	2.39E+00	1.04E-01	1.55E-01			
Soil							8.35E-03	1.51E-02	4.22E-02
Fish									
Benthic									
Aquatic Veg	4.30E-03	5.67E-01	7.26E-03	3.46E-01	1.51E-02	2.25E-02			
Browse	3.65E-02	4.66E-02	3.65E-02	5.88E-02	3.65E-02	5.88E-02			
Forage									
Berries							6.90E-03	1.40E-02	1.00E-02
Lichen									
Hare							1.79E-04	2.38E-04	3.67E-04
Moose									
Caribou									
Ducks							1.35E-02	3.09E-01	5.07E-01
Total	7.06E-02	4.54E+00	9.39E-02	2.80E+00	1.56E-01	2.37E-01	2.93E-02	3.49E-01	5.76E-01

by Pathway

Lead Pathway	Caribou Overall	Hare					Moose Overall	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	2.58E-04	3.96E-04	1.20E-03	5.28E-04	5.28E-04	5.28E-04	2.98E-04	5.58E-04	3.21E-04	9.75E-04	4.28E-04	4.28E-04	4.28E-04
Sediment							3.94E-02						
Soil	6.91E-01	4.69E-02	1.01E+00	9.32E-01	8.20E+00	3.73E+00		2.91E-02	4.37E-02	9.38E-01	8.68E-01	7.63E+00	3.47E+00
Fish													
Benthic							2.95E-03						
Aquatic Veg							1.46E-01						
Browse	8.09E-03	1.38E-02	1.32E-01	7.10E-01	1.32E+00	6.31E-02		1.20E-02	2.24E-02	2.13E-01	1.15E+00	2.13E+00	1.02E-01
Forage	1.04E-03	2.77E-03	1.18E-01	1.94E-02	8.80E-01	6.39E-02			7.02E-04	9.71E-03	7.98E-03	2.46E-02	3.96E-03
Berries													
Lichen	1.41E+00												
Hare													
Moose													
Caribou													
Ducks													
Total	2.11E+00	6.39E-02	1.26E+00	1.66E+00	1.04E+01	3.86E+00	1.89E-01	4.16E-02	6.70E-02	1.16E+00	2.02E+00	9.79E+00	3.58E+00

Manganese Pathway	Caribou Overall	Hare					Moose Overall	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	3.33E-02	1.30E-03	3.62E-01	3.80E-02	3.80E-02	3.80E-02	3.83E-02	1.26E-01	1.06E-03	2.94E-01	3.08E-02	3.08E-02	3.08E-02
Sediment							3.04E+00						
Soil	7.58E-01	4.07E+00	5.63E+00	1.67E+00	1.49E+00	2.18E+00		1.07E+00	3.79E+00	5.24E+00	1.56E+00	1.39E+00	2.03E+00
Fish													
Benthic							4.31E-01						
Aquatic Veg							8.27E+00						
Browse	4.57E-01	3.96E+01	3.91E+01	1.16E+01	1.04E+01	5.10E+01		1.77E+01	6.41E+01	6.33E+01	1.88E+01	1.68E+01	8.24E+01
Forage	6.27E-02	1.70E+01	1.59E+01	1.83E+01	1.21E+01	3.34E+01			1.09E+00	3.26E-01	3.37E+00	8.54E-01	1.55E+00
Berries													
Lichen	1.89E+00												
Hare													
Moose													
Caribou													
Ducks													
Total	3.20E+00	6.08E+01	6.10E+01	3.16E+01	2.40E+01	8.66E+01	1.18E+01	1.89E+01	6.90E+01	6.92E+01	2.38E+01	1.91E+01	8.61E+01

Nickel Pathway	Caribou Overall	Hare					Moose Overall	Sheep	Grouse				
		Bkgd	Van-S	Faro-N	Faro-S	Faro-W			Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	6.42E-04	9.29E-05	6.18E-03	8.53E-04	8.53E-04	8.53E-04	7.41E-04	2.33E-03	7.54E-05	5.01E-03	6.92E-04	6.92E-04	6.92E-04
Sediment							5.55E-02						
Soil	1.05E-02	2.72E-02	9.78E-02	2.42E-02	5.45E-02	4.66E-02		1.61E-03	2.53E-02	9.11E-02	2.26E-02	5.07E-02	4.34E-02
Fish													
Benthic							7.35E-04						
Aquatic Veg							4.72E-02						
Browse	2.61E-03	1.52E-01	1.79E-01	3.00E-02	2.02E-01	3.05E-01		9.51E-02	2.46E-01	2.90E-01	4.85E-02	3.26E-01	4.94E-01
Forage	2.27E-04	2.32E-02	6.73E-02	6.16E-02	4.45E-02	2.14E-01			4.29E-03	8.91E-03	6.20E-03	5.09E-03	3.40E-02
Berries													
Lichen	1.34E-02												
Hare													
Moose													
Caribou													
Ducks													
Total	2.73E-02	2.03E-01	3.50E-01	1.17E-01	3.02E-01	5.67E-01	1.04E-01	9.90E-02	2.76E-01	3.95E-01	7.80E-02	3.83E-01	5.72E-01

by Pathway

Lead	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	7.72E-05	1.63E-04	1.27E-04	3.71E-04	1.22E-04	1.22E-04	6.95E-05	1.47E-04	1.15E-04	3.34E-04	1.10E-04	1.10E-04	8.53E-05	1.80E-04	1.41E-04	4.10E-04	1.35E-04	1.34E-04
Sediment	6.35E-02	1.34E-01	1.05E-01	3.05E-01	1.01E-01	1.00E-01	4.12E-02	8.70E-02	6.79E-02	1.98E-01	6.52E-02	6.49E-02	2.75E-01	5.82E-01	4.54E-01	1.32E+00	4.37E-01	4.34E-01
Soil																		
Fish							2.29E-02	4.85E-02	3.78E-02	1.10E-01	3.63E-02	3.61E-02						
Benthic	2.30E-02	4.87E-02	3.80E-02	1.11E-01	3.65E-02	3.63E-02							3.72E-02	7.87E-02	6.14E-02	1.79E-01	5.90E-02	5.87E-02
Aquatic Veg	1.17E-02	2.47E-02	1.93E-02	5.61E-02	1.85E-02	1.84E-02							5.64E-03	1.19E-02	9.31E-03	2.71E-02	8.95E-03	8.90E-03
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	9.83E-02	2.08E-01	1.62E-01	4.73E-01	1.56E-01	1.55E-01	6.41E-02	1.36E-01	1.06E-01	3.09E-01	1.02E-01	1.01E-01	3.18E-01	6.73E-01	5.25E-01	1.53E+00	5.05E-01	5.02E-01

Manganese	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.29E-03	1.17E-02	6.12E-04	1.12E-01	4.02E-04	7.22E-04	1.16E-03	1.06E-02	5.51E-04	1.01E-01	3.62E-04	6.51E-04	1.43E-03	1.30E-02	6.76E-04	1.24E-01	4.44E-04	7.98E-04
Sediment	6.37E-01	5.79E+00	3.02E-01	5.52E+01	1.98E-01	3.57E-01	4.13E-01	3.76E+00	1.96E-01	3.58E+01	1.29E-01	2.31E-01	2.76E+00	2.51E+01	1.31E+00	2.39E+02	8.60E-01	1.55E+00
Soil																		
Fish							1.10E+00	1.00E+01	5.24E-01	9.57E+01	3.44E-01	6.18E-01						
Benthic	3.85E+00	3.50E+01	1.83E+00	3.34E+02	1.20E+00	2.16E+00							6.22E+00	5.66E+01	2.95E+00	5.39E+02	1.94E+00	3.48E+00
Aquatic Veg	2.21E-01	2.01E+00	1.05E-01	1.92E+01	6.89E-02	1.24E-01							1.07E-01	9.73E-01	5.07E-02	9.27E+00	3.33E-02	5.99E-02
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	4.71E+00	4.28E+01	2.23E+00	4.08E+02	1.47E+00	2.64E+00	1.52E+00	1.38E+01	7.20E-01	1.32E+02	4.73E-01	8.50E-01	9.09E+00	8.27E+01	4.31E+00	7.88E+02	2.83E+00	5.09E+00

Nickel	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	3.91E-05	2.64E-04	1.70E-04	1.91E-03	2.87E-05	3.38E-05	3.52E-05	2.37E-04	1.53E-04	1.72E-03	2.59E-05	3.04E-05	4.32E-05	2.91E-04	1.88E-04	2.11E-03	3.17E-05	3.73E-05
Sediment	1.82E-02	1.23E-01	7.94E-02	8.90E-01	1.34E-02	1.57E-02	1.18E-02	7.96E-02	5.15E-02	5.77E-01	8.67E-03	1.02E-02	7.91E-02	5.33E-01	3.44E-01	3.86E+00	5.80E-02	6.83E-02
Soil																		
Fish							8.20E-03	5.52E-02	3.57E-02	4.00E-01	6.02E-03	7.08E-03						
Benthic	1.17E-02	7.86E-02	5.08E-02	5.70E-01	8.56E-03	1.01E-02							1.89E-02	1.27E-01	8.21E-02	9.21E-01	1.38E-02	1.63E-02
Aquatic Veg	5.92E-04	3.99E-03	2.58E-03	2.89E-02	4.34E-04	5.11E-04							2.86E-04	1.93E-03	1.25E-03	1.40E-02	2.10E-04	2.47E-04
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	3.05E-02	2.06E-01	1.33E-01	1.49E+00	2.24E-02	2.64E-02	2.01E-02	1.35E-01	8.73E-02	9.79E-01	1.47E-02	1.73E-02	9.83E-02	6.62E-01	4.28E-01	4.80E+00	7.21E-02	8.49E-02

by Pathway

Lead Pathway	Hoary Marmot					Bear			Wolf Overall	Mink					
	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	3.60E-04	1.09E-03	4.80E-04	4.80E-04	4.80E-04	2.53E-04	7.68E-04	3.38E-04	9.69E-05	2.66E-04	5.63E-04	4.39E-04	1.28E-03	4.22E-04	4.20E-04
Sediment										1.77E-01	3.75E-01	2.93E-01	8.54E-01	2.81E-01	2.80E-01
Soil	2.10E-02	4.51E-01	4.17E-01	3.67E+00	1.67E+00	1.61E-02	2.04E-01	1.95E+00	1.62E-01	2.61E-02	5.53E-02	4.31E-02	1.26E-01	4.14E-02	4.12E-02
Fish						4.04E-03	1.22E-02	5.38E-03		5.32E-03	1.13E-02	8.78E-03	2.56E-02	8.44E-03	8.39E-03
Benthic										4.44E-03	9.38E-03	7.32E-03	2.13E-02	7.03E-03	7.00E-03
Aquatic Veg															
Browse															
Forage	5.92E-03	2.52E-01	4.13E-02	1.88E+00	1.36E-01	1.04E-03	3.93E-02	2.37E-01							
Berries						6.93E-04	3.65E-03	2.06E-02							
Lichen									4.11E-03	1.38E-04	2.24E-02	1.38E-04	2.71E-03	1.38E-04	2.71E-03
Hare									5.81E-04						
Moose						2.11E-04	2.11E-04	2.11E-04	2.83E-03						
Caribou						1.03E-03	1.03E-03	1.03E-03							
Ducks										3.38E-04	7.15E-04	5.58E-04	1.63E-03	5.36E-04	5.34E-04
Total	2.73E-02	7.04E-01	4.59E-01	5.55E+00	1.81E+00	2.33E-02	2.61E-01	2.21E+00	1.70E-01	2.14E-01	4.75E-01	3.53E-01	1.03E+00	3.39E-01	3.40E-01

Manganese Pathway	Hoary Marmot					Bear			Wolf Overall	Mink					
	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.18E-03	3.29E-01	3.45E-02	3.45E-02	3.45E-02	8.31E-04	2.31E-01	2.43E-02	1.25E-02	4.45E-03	4.05E-02	2.11E-03	3.86E-01	1.39E-03	2.49E-03
Sediment										1.78E+00	1.62E+01	8.44E-01	1.54E+02	5.54E-01	9.97E-01
Soil	1.82E+00	2.52E+00	7.49E-01	6.69E-01	9.74E-01	1.39E+00	1.80E+00	1.02E+00	1.78E-01	1.26E+00	1.15E+01	5.97E-01	1.09E+02	3.92E-01	7.05E-01
Fish						3.82E-02	1.06E+01	1.12E+00		8.90E-01	8.10E+00	4.22E-01	7.71E+01	2.77E-01	4.98E-01
Benthic										8.41E-02	7.65E-01	3.98E-02	7.29E+00	2.62E-02	4.71E-02
Aquatic Veg															
Browse															
Forage	3.64E+01	3.38E+01	3.90E+01	2.58E+01	7.13E+01	6.41E+00	1.46E+01	8.09E+00							
Berries						1.07E+00	6.59E-01	7.68E-01							
Lichen									2.24E-04	4.68E-04	1.85E-04	4.68E-04	4.70E-04	4.68E-04	4.70E-04
Hare									4.52E-02						
Moose						1.64E-02	1.64E-02	1.64E-02	2.15E-03						
Caribou						7.80E-04	7.80E-04	7.80E-04		2.71E-03	2.46E-02	1.28E-03	2.35E-01	8.44E-04	1.52E-03
Ducks															
Total	3.82E+01	3.67E+01	3.98E+01	2.65E+01	7.23E+01	8.94E+00	2.80E+01	1.10E+01	2.38E-01	4.02E+00	3.66E+01	1.91E+00	3.49E+02	1.25E+00	2.25E+00

Nickel Pathway	Hoary Marmot					Bear			Wolf Overall	Mink					
	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	8.44E-05	5.62E-03	7.75E-04	7.75E-04	7.75E-04	5.94E-05	3.95E-03	5.45E-04	2.41E-04	1.35E-04	9.09E-04	5.87E-04	6.59E-03	9.90E-05	1.17E-04
Sediment										5.10E-02	3.43E-01	2.22E-01	2.49E+00	3.74E-02	4.40E-02
Soil	1.22E-02	4.38E-02	1.08E-02	2.44E-02	2.09E-02	9.30E-03	2.46E-02	1.86E-02	2.46E-03	9.36E-03	6.30E-02	4.07E-02	4.57E-01	6.86E-03	8.08E-03
Fish						6.68E-04	4.45E-02	6.14E-03		2.70E-03	1.82E-02	1.17E-02	1.32E-01	1.98E-03	2.33E-03
Benthic										2.25E-04	1.51E-03	9.79E-04	1.10E-02	1.65E-04	1.94E-04
Aquatic Veg															
Browse															
Forage	4.96E-02	1.44E-01	1.31E-01	9.50E-02	4.58E-01	8.74E-03	2.30E-02	1.63E-02							
Berries						4.24E-03	1.82E-02	5.57E-03							
Lichen									1.57E-05	1.87E-05	2.79E-05	1.87E-05	3.24E-05	1.87E-05	3.24E-05
Hare									4.80E-03						
Moose						1.74E-03	1.74E-03	1.74E-03	2.20E-04						
Caribou						7.99E-05	7.99E-05	7.99E-05		1.57E-03	1.06E-02	6.85E-03	7.68E-02	1.15E-03	1.36E-03
Ducks															
Total	6.19E-02	1.93E-01	1.43E-01	1.20E-01	4.79E-01	2.48E-02	1.16E-01	4.90E-02	7.73E-03	6.50E-02	4.38E-01	2.83E-01	3.17E+00	4.77E-02	5.61E-02

by Pathway

Lead	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.94E-04	4.10E-04	3.20E-04	9.32E-04	3.07E-04	3.06E-04	3.63E-04	1.10E-03	4.84E-04
Sediment	3.36E-02	7.11E-02	5.55E-02	1.62E-01	5.33E-02	5.30E-02	6.66E-03	8.45E-02	8.08E-01
Soil									
Fish									
Benthic									
Aquatic Veg	8.40E-03	1.78E-02	1.39E-02	4.04E-02	1.33E-02	1.32E-02			
Browse	2.19E-03	1.42E-01	2.19E-03	1.73E-02	2.19E-03	1.73E-02			
Forage									
Berries							1.81E-04	9.50E-04	5.38E-03
Lichen									
Hare							3.72E-04	7.33E-03	6.05E-02
Moose									
Caribou									
Ducks							1.42E-03	4.30E-03	1.89E-03
Total	4.44E-02	2.31E-01	7.18E-02	2.20E-01	6.91E-02	8.39E-02	8.99E-03	9.81E-02	8.76E-01

Manganese	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	3.24E-03	2.95E-02	1.54E-03	2.81E-01	1.01E-03	1.81E-03	1.19E-03	3.32E-01	3.48E-02
Sediment	3.37E-01	3.07E+00	1.60E-01	2.92E+01	1.05E-01	1.89E-01	5.78E-01	7.46E-01	4.24E-01
Soil									
Fish									
Benthic									
Aquatic Veg	1.59E-01	1.45E+00	7.55E-02	1.38E+01	4.96E-02	8.91E-02			
Browse	6.29E+00	2.45E+01	6.29E+00	5.80E+00	6.29E+00	5.80E+00			
Forage									
Berries							2.80E-01	1.72E-01	2.00E-01
Lichen									
Hare							1.26E-03	1.27E-03	4.99E-04
Moose									
Caribou									
Ducks							2.23E-03	6.19E-01	6.50E-02
Total	6.79E+00	2.91E+01	6.53E+00	4.91E+01	6.45E+00	6.08E+00	8.63E-01	1.87E+00	7.24E-01

Nickel	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	9.82E-05	6.62E-04	4.28E-04	4.80E-03	7.21E-05	8.48E-05	8.51E-05	5.66E-03	7.81E-04
Sediment	9.65E-03	6.50E-02	4.20E-02	4.71E-01	7.08E-03	8.34E-03	3.86E-03	1.02E-02	7.71E-03
Soil									
Fish									
Benthic									
Aquatic Veg	4.26E-04	2.87E-03	1.85E-03	2.08E-02	3.13E-04	3.68E-04			
Browse	2.42E-02	2.99E-02	2.42E-02	3.30E-02	2.42E-02	3.30E-02			
Forage									
Berries							1.10E-03	4.75E-03	1.45E-03
Lichen									
Hare							5.07E-05	8.75E-05	7.53E-05
Moose									
Caribou									
Ducks							3.05E-03	2.03E-01	2.80E-02
Total	3.44E-02	9.84E-02	6.85E-02	5.30E-01	3.17E-02	4.18E-02	8.14E-03	2.23E-01	3.80E-02

by Pathway

Silver	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	1.65E-05	9.29E-06	6.74E-05	4.37E-05	4.37E-05	4.37E-05	1.91E-05	4.87E-05	7.54E-06	5.47E-05	3.55E-05	3.55E-05	3.55E-05
Sediment							7.39E-05						
Soil	1.46E-03	4.60E-03	4.07E-03	4.07E-03	9.63E-03	4.07E-03		1.61E-03	4.28E-03	3.79E-03	3.79E-03	8.96E-03	3.79E-03
Fish													
Benthic													
Aquatic Veg							1.26E-03						
Browse	3.34E-05	6.10E-04	5.43E-03	5.00E-04	4.14E-03	2.23E-03	6.05E-04		9.87E-04	8.79E-03	8.09E-04	6.70E-03	3.61E-03
Forage	4.05E-06	4.05E-04	1.38E-03	1.20E-03	1.31E-03	5.00E-03		5.05E-04					
Berries									1.64E-04	2.62E-04	4.92E-04	5.14E-05	4.06E-04
Lichen	3.57E-03												
Hare													
Moose													
Caribou													
Ducks													
Total	5.09E-03	5.62E-03	1.10E-02	5.82E-03	1.51E-02	1.14E-02	1.96E-03	2.17E-03	5.44E-03	1.29E-02	5.13E-03	1.57E-02	7.84E-03

Thallium	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment							n/a						
Soil	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fish													
Benthic													
Aquatic Veg							n/a						
Browse	7.82E-06	5.68E-04	7.52E-04	7.52E-04	7.52E-04	7.52E-04	1.42E-04		9.19E-04	1.22E-03	1.22E-03	1.22E-03	1.22E-03
Forage	4.11E-06	3.08E-04	3.72E-04	3.62E-04	3.61E-03	2.44E-04		1.84E-03					
Berries									7.35E-05	6.46E-05	5.57E-05	8.44E-05	7.76E-05
Lichen	1.59E-03												
Hare													
Moose													
Caribou													
Ducks													
Total	1.60E-03	8.77E-04	1.12E-03	1.11E-03	4.37E-03	9.96E-04	1.42E-04	1.84E-03	9.92E-04	1.28E-03	1.27E-03	1.30E-03	1.29E-03

Tin	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment							n/a						
Soil	3.70E-03	1.02E-02	3.18E-02	1.66E-02	1.28E-02	1.57E-02	n/a	1.13E-02	9.47E-03	2.96E-02	1.54E-02	1.19E-02	1.46E-02
Fish													
Benthic													
Aquatic Veg							n/a						
Browse	9.98E-05	1.20E-02	2.01E-02	1.05E-02	8.09E-03	3.76E-03	1.81E-03		1.93E-02	3.25E-02	1.69E-02	1.31E-02	6.08E-03
Forage	2.02E-05	8.95E-03	1.86E-03	6.42E-03	1.89E-03	6.61E-03		7.29E-03					
Berries									6.08E-04	3.23E-04	3.09E-02	2.91E-03	3.88E-04
Lichen	1.85E-02												
Hare													
Moose													
Caribou													
Ducks													
Total	2.23E-02	3.11E-02	5.37E-02	3.34E-02	2.28E-02	2.61E-02	1.81E-03	1.86E-02	2.94E-02	6.24E-02	6.32E-02	2.79E-02	2.11E-02

by Pathway

Silver	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	2.87E-06	1.35E-05	2.26E-05	2.08E-05	2.87E-06	2.00E-07	2.59E-06	1.22E-05	2.04E-05	1.88E-05	2.59E-06	1.80E-07	3.17E-06	1.49E-05	2.50E-05	2.30E-05	3.17E-06	2.21E-07
Sediment	6.93E-05	3.26E-04	5.46E-04	5.02E-04	6.93E-05	4.83E-06	4.49E-05	2.11E-04	3.54E-04	3.26E-04	4.49E-05	3.13E-06	3.00E-04	1.41E-03	2.37E-03	2.18E-03	3.00E-04	2.10E-05
Soil																		
Fish							4.34E-03	2.04E-02	3.42E-02	3.15E-02	4.34E-03	3.03E-04						
Benthic	1.71E-03	8.06E-03	1.35E-02	1.24E-02	1.71E-03	1.20E-04							2.77E-03	1.30E-02	2.18E-02	2.01E-02	2.77E-03	1.93E-04
Aquatic Veg	2.89E-03	1.36E-02	2.28E-02	2.10E-02	2.89E-03	2.02E-04							1.40E-03	6.59E-03	1.10E-02	1.02E-02	1.40E-03	9.77E-05
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	4.68E-03	2.20E-02	3.69E-02	3.39E-02	4.68E-03	3.26E-04	4.38E-03	2.06E-02	3.46E-02	3.18E-02	4.38E-03	3.06E-04	4.47E-03	2.10E-02	3.53E-02	3.24E-02	4.47E-03	3.12E-04

Thallium	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Soil																		
Fish							n/a	n/a	n/a	n/a	n/a	n/a						
Benthic	n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a	n/a	n/a	n/a
Aquatic Veg	n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a	n/a	n/a	n/a
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Tin	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Soil																		
Fish							n/a	n/a	n/a	n/a	n/a	n/a						
Benthic	n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a	n/a	n/a	n/a
Aquatic Veg	n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a	n/a	n/a	n/a
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

by Pathway

Silver	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	8.44E-06	6.13E-05	3.97E-05	3.97E-05	3.97E-05	5.94E-06	4.31E-05	2.79E-05	6.20E-06	9.90E-06	4.66E-05	7.81E-05	7.18E-05	9.90E-06	6.91E-07
Sediment															
Soil	2.06E-03	1.82E-03	1.82E-03	4.31E-03	1.82E-03	1.57E-03	1.39E-03	2.59E-03	3.44E-04	1.94E-04	9.11E-04	1.53E-03	1.40E-03	1.94E-04	1.35E-05
Fish						4.82E-04	3.49E-03	2.27E-03		4.95E-03	2.33E-02	3.90E-02	3.59E-02	4.95E-03	3.45E-04
Benthic										3.96E-04	1.86E-03	3.12E-03	2.87E-03	3.96E-04	2.76E-05
Aquatic Veg										1.10E-03	5.18E-03	8.68E-03	7.98E-03	1.10E-03	7.68E-05
Browse															
Forage															
Berries	8.63E-04	2.95E-03	2.56E-03	2.79E-03	1.07E-02	1.52E-04	4.65E-04	3.64E-04							
Lichen						1.62E-04	1.37E-04	4.60E-05							
Hare									2.49E-07	2.60E-07	6.98E-07	2.60E-07	5.06E-07	2.60E-07	5.06E-07
Moose						1.64E-05	1.64E-05	1.64E-05	4.51E-05						
Caribou						7.43E-06	7.43E-06	7.43E-06	2.05E-05						
Ducks										1.11E-04	5.23E-04	8.77E-04	8.07E-04	1.11E-04	7.76E-06
Total	2.93E-03	4.83E-03	4.43E-03	7.14E-03	1.25E-02	2.40E-03	5.56E-03	5.32E-03	4.16E-04	6.76E-03	3.18E-02	5.33E-02	4.90E-02	6.76E-03	4.72E-04

Thallium	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment										n/a	n/a	n/a	n/a	n/a	n/a
Soil	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a						
Fish						n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a
Benthic										n/a	n/a	n/a	n/a	n/a	n/a
Aquatic Veg										n/a	n/a	n/a	n/a	n/a	n/a
Browse															
Forage	6.58E-04	7.94E-04	7.72E-04	7.71E-03	5.20E-04	1.16E-04	2.13E-04	1.10E-03							
Berries						7.27E-05	1.27E-04	7.55E-05							
Lichen															
Hare									4.33E-07	4.05E-07	2.02E-06	4.05E-07	5.19E-07	4.05E-07	5.19E-07
Moose						1.18E-05	1.18E-05	1.18E-05	3.26E-05						
Caribou						2.34E-05	2.34E-05	2.34E-05	6.44E-05						
Ducks										n/a	n/a	n/a	n/a	n/a	n/a
Total	6.58E-04	7.94E-04	7.72E-04	7.71E-03	5.20E-04	2.24E-04	3.75E-04	1.21E-03	9.75E-05	4.05E-07	2.02E-06	4.05E-07	5.19E-07	4.05E-07	5.19E-07

Tin	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment										n/a	n/a	n/a	n/a	n/a	n/a
Soil	4.56E-03	1.42E-02	7.41E-03	5.73E-03	7.04E-03	3.48E-03	7.00E-03	4.99E-03	8.70E-04						
Fish						n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a
Benthic										n/a	n/a	n/a	n/a	n/a	n/a
Aquatic Veg										n/a	n/a	n/a	n/a	n/a	n/a
Browse															
Forage	1.91E-02	3.97E-03	1.37E-02	4.03E-03	1.41E-02	3.37E-03	1.06E-03	8.08E-04							
Berries						6.01E-04	6.36E-04	1.53E-03							
Lichen									8.53E-06	1.44E-05	1.05E-05	1.44E-05	2.48E-05	1.44E-05	2.48E-05
Hare						1.51E-04	1.51E-04	1.51E-04	4.16E-04						
Moose						3.26E-04	3.26E-04	3.26E-04	8.99E-04						
Caribou										n/a	n/a	n/a	n/a	n/a	n/a
Ducks															
Total	2.37E-02	1.82E-02	2.11E-02	9.76E-03	2.12E-02	7.93E-03	9.17E-03	7.81E-03	2.19E-03	1.44E-05	1.05E-05	1.44E-05	2.48E-05	1.44E-05	2.48E-05

by Pathway

Silver	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	7.21E-06	3.39E-05	5.69E-05	5.23E-05	7.21E-06	5.03E-07	8.51E-06	6.17E-05	4.01E-05
Sediment	3.67E-05	1.73E-04	2.89E-04	2.66E-04	3.67E-05	2.56E-06			
Soil							6.53E-04	5.78E-04	1.07E-03
Fish									
Benthic									
Aquatic Veg	2.08E-03	9.80E-03	1.64E-02	1.51E-02	2.08E-03	1.45E-04			
Browse	9.69E-05	4.97E-04	9.69E-05	6.84E-04	9.69E-05	6.84E-04			
Forage									
Berries							4.22E-05	3.56E-05	1.20E-05
Lichen									
Hare							7.02E-07	1.37E-06	1.89E-06
Moose									
Caribou									
Ducks							2.93E-04	2.13E-03	1.38E-03
Total	2.22E-03	1.05E-02	1.69E-02	1.61E-02	2.22E-03	8.32E-04	9.98E-04	2.81E-03	2.51E-03

Thallium	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a			
Soil							n/a	n/a	n/a
Fish									
Benthic									
Aquatic Veg	n/a	n/a	n/a	n/a	n/a	n/a			
Browse	9.02E-05	9.29E-05	9.02E-05	1.19E-04	9.02E-05	1.19E-04			
Forage									
Berries							1.89E-05	3.32E-05	1.97E-05
Lichen									
Hare							1.09E-06	1.40E-06	5.45E-06
Moose									
Caribou									
Ducks							n/a	n/a	n/a
Total	9.02E-05	9.29E-05	9.02E-05	1.19E-04	9.02E-05	1.19E-04	2.00E-05	3.46E-05	2.51E-05

Tin	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a			
Soil							1.44E-03	2.90E-03	2.07E-03
Fish									
Benthic									
Aquatic Veg	n/a	n/a	n/a	n/a	n/a	n/a			
Browse	1.90E-03	4.79E-03	1.90E-03	2.05E-03	1.90E-03	2.05E-03			
Forage									
Berries							1.57E-04	1.66E-04	3.98E-04
Lichen									
Hare							3.88E-05	6.71E-05	2.84E-05
Moose									
Caribou									
Ducks							n/a	n/a	n/a
Total	1.90E-03	4.79E-03	1.90E-03	2.05E-03	1.90E-03	2.05E-03	1.64E-03	3.13E-03	2.50E-03

by Pathway

Zinc	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	1.19E-01	7.77E-04	1.07E+00	3.86E-01	3.86E-01	3.86E-01	1.38E-01	3.71E-01	6.30E-04	8.67E-01	3.14E-01	3.14E-01	3.14E-01
Sediment							4.79E+00						
Soil	5.63E-01	6.50E-01	1.83E+00	1.00E+00	5.02E+00	2.99E+00		2.73E-01	6.05E-01	1.70E+00	9.35E-01	4.68E+00	2.78E+00
Fish													
Benthic							1.18E+01						
Aquatic Veg							4.82E+00						
Browse	2.66E-01	1.25E+01	8.38E+00	9.45E+00	3.23E+01	2.57E+01			2.03E+01	1.35E+01	1.53E+01	5.23E+01	4.16E+01
Forage	1.30E-02	1.44E+00	1.30E+01	2.00E+00	4.61E+00	2.48E+00		1.49E+00					
Berries									9.39E-02	1.48E-01	8.12E-02	2.44E-01	2.49E-01
Lichen	2.13E+00												
Hare													
Moose													
Caribou													
Ducks													
Total	3.09E+00	1.46E+01	2.43E+01	1.28E+01	4.23E+01	3.16E+01	2.16E+01	2.13E+00	2.10E+01	1.63E+01	1.66E+01	5.75E+01	4.49E+01

by Pathway

Zinc	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.29E-03	1.19E-01	5.62E-04	3.30E-01	2.40E-04	2.12E-03	1.16E-03	1.08E-01	5.06E-04	2.98E-01	2.16E-04	1.91E-03	1.43E-03	1.32E-01	6.21E-04	3.65E-01	2.65E-04	2.35E-03
Sediment	2.80E-01	2.59E+01	1.22E-01	7.16E+01	5.20E-02	4.60E-01	1.81E-01	1.68E+01	7.89E-02	4.64E+01	3.37E-02	2.98E-01	1.21E+00	1.12E+02	5.28E-01	3.10E+02	2.26E-01	2.00E+00
Soil																		
Fish							6.06E+00	5.61E+02	2.64E+00	1.55E+03	1.13E+00	9.97E+00						
Benthic	1.04E+01	9.58E+02	4.50E+00	2.65E+03	1.93E+00	1.70E+01							1.67E+01	1.55E+03	7.28E+00	4.28E+03	3.11E+00	2.75E+01
Aquatic Veg	1.69E+00	1.57E+02	7.36E-01	4.33E+02	3.15E-01	2.78E+00							8.19E-01	7.57E+01	3.56E-01	2.09E+02	1.52E-01	1.35E+00
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	1.23E+01	1.14E+03	5.36E+00	3.15E+03	2.29E+00	2.03E+01	6.25E+00	5.78E+02	2.72E+00	1.60E+03	1.16E+00	1.03E+01	1.88E+01	1.74E+03	8.16E+00	4.80E+03	3.49E+00	3.09E+01

by Pathway

Zinc	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	7.06E-04	9.72E-01	3.51E-01	3.51E-01	3.51E-01	4.97E-04	6.83E-01	2.47E-01	4.48E-02	4.46E-03	4.12E-01	1.94E-03	1.14E+00	8.28E-04	7.33E-03
Sediment										7.82E-01	7.23E+01	3.40E-01	2.00E+02	1.45E-01	1.29E+00
Soil	2.91E-01	8.19E-01	4.50E-01	2.25E+00	1.34E+00	2.23E-01	4.56E-01	1.31E+00	1.32E-01						
Fish						1.25E-01	1.72E+02	6.23E+01		6.92E+00	6.40E+02	3.01E+00	1.77E+03	1.29E+00	1.14E+01
Benthic										2.39E+00	2.21E+02	1.04E+00	6.12E+02	4.45E-01	3.94E+00
Aquatic Veg										6.44E-01	5.95E+01	2.80E-01	1.65E+02	1.20E-01	1.06E+00
Browse															
Forage	3.07E+00	2.77E+01	4.27E+00	9.84E+00	5.29E+00	5.42E-01	4.26E+00	1.38E+00							
Berries						9.28E-02	1.66E-01	2.03E-01							
Lichen															
Hare									2.14E-02	2.25E-02	6.52E-02	2.25E-02	3.74E-02	2.25E-02	3.74E-02
Moose						6.01E+00	6.01E+00	6.01E+00	1.66E+01						
Caribou						1.51E-01	1.51E-01	1.51E-01	4.15E-01						
Ducks										9.73E-01	8.99E+01	4.23E-01	2.49E+02	1.81E-01	1.60E+00
Total	3.36E+00	2.95E+01	5.07E+00	1.24E+01	6.98E+00	7.14E+00	1.84E+02	7.16E+01	1.72E+01	1.17E+01	1.08E+03	5.12E+00	3.00E+03	2.20E+00	1.93E+01

by Pathway

Zinc	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	3.24E-03	3.00E-01	1.41E-03	8.30E-01	6.03E-04	5.34E-03	7.12E-04	9.80E-01	3.54E-01
Sediment	1.48E-01	1.37E+01	6.44E-02	3.79E+01	2.75E-02	2.44E-01	9.23E-02	1.89E-01	5.44E-01
Soil									
Fish									
Benthic									
Aquatic Veg	1.22E+00	1.13E+02	5.30E-01	3.12E+02	2.27E-01	2.00E+00	2.42E-02	4.32E-02	5.29E-02
Browse	1.99E+00	3.84E+00	1.99E+00	2.83E+00	1.99E+00	2.83E+00			
Forage									
Berries									
Lichen							6.08E-02	1.01E-01	1.76E-01
Hare									
Moose									
Caribou							4.77E-01	6.56E+02	2.37E+02
Ducks									
Total	3.36E+00	1.31E+02	2.59E+00	3.53E+02	2.24E+00	5.09E+00	6.55E-01	6.58E+02	2.38E+02

Pct by Pathway

Percent Intake by Pathway

Arsenic	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.74%	0.16%	0.96%	3.77%	0.84%	1.41%	1.20%	4.50%	0.09%	0.77%	2.43%	0.58%	1.09%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
Sediment							48.27%							4.68%	4.68%	4.68%	4.68%	4.68%	4.68%
Soil	26.17%	22.34%	57.52%	38.07%	39.11%	66.36%		7.19%	15.44%	53.13%	28.12%	31.25%	59.04%						
Fish																			
Benthic														95.20%	95.20%	95.20%	95.20%	95.20%	95.20%
Aquatic Veg							0.40%							0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
Browse	1.96%	67.51%	25.29%	53.75%	48.11%	25.60%	50.13%		81.08%	40.59%	68.98%	66.80%	39.57%						
Forage	0.13%	9.99%	16.24%	4.40%	11.94%	6.63%		88.31%											
Berries									3.38%	5.51%	0.48%	1.36%	0.30%						
Lichen	71.00%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.50%	0.02%	0.62%	0.85%	0.23%	0.19%	0.06%	9.98%	0.01%	0.32%	0.62%	0.12%	0.10%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sediment							1.06%							0.33%	0.33%	0.33%	0.33%	0.33%	0.33%
Soil	21.99%	3.54%	2.47%	25.77%	4.29%	2.50%		20.38%	2.15%	1.47%	21.44%	2.58%	1.50%						
Fish																			
Benthic														38.26%	38.26%	38.26%	38.26%	38.26%	38.26%
Aquatic Veg							80.22%							61.40%	61.40%	61.40%	61.40%	61.40%	61.40%
Browse	27.99%	92.59%	94.09%	53.17%	92.71%	94.15%	18.66%		97.69%	97.58%	76.88%	96.97%	97.67%						
Forage	0.24%	3.85%	2.82%	20.21%	2.77%	3.16%		69.64%											
Berries									0.16%	0.62%	1.05%	0.33%	0.74%						
Lichen	48.27%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.81%	0.11%	1.86%	3.37%	1.98%	2.57%	0.39%	1.70%	0.08%	1.26%	2.45%	1.50%	1.86%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
Sediment							85.93%							30.45%	30.45%	30.45%	30.45%	30.45%	30.45%
Soil	34.19%	13.70%	24.88%	24.93%	46.00%	34.53%		4.37%	12.08%	19.40%	20.80%	39.93%	28.68%						
Fish																			
Benthic														66.28%	66.28%	66.28%	66.28%	66.28%	66.28%
Aquatic Veg							3.74%							3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
Browse	2.94%	53.44%	52.12%	43.71%	35.93%	42.68%	9.94%		81.92%	70.63%	63.39%	54.20%	61.59%						
Forage	0.44%	32.76%	21.14%	28.00%	16.09%	20.21%		93.93%											
Berries									5.91%	8.70%	13.36%	4.38%	7.87%						
Lichen	60.63%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Percent Intake by Patl

Arsenic	Merganser						Scaup						Hoary Marmot				
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.45%	1.42%	11.49%	1.74%	2.84%
Sediment	37.32%	37.32%	37.32%	37.32%	37.32%	37.32%	11.66%	11.66%	11.66%	11.66%	11.66%	11.66%	31.79%	42.01%	57.04%	40.01%	65.80%
Fish	62.47%	62.47%	62.47%	62.47%	62.47%	62.47%											
Benthic							88.30%	88.30%	88.30%	88.30%	88.30%	88.30%					
Aquatic Veg							0.03%	0.03%	0.03%	0.03%	0.03%	0.03%					
Browse													67.76%	56.56%	31.47%	58.25%	31.37%
Forage																	
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Merganser						Scaup						Hoary Marmot				
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.15%	7.35%	1.40%	2.60%	2.10%
Sediment	6.62%	6.62%	6.62%	6.62%	6.62%	6.62%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%	16.11%	14.39%	20.80%	23.85%	13.94%
Soil																	
Fish	93.29%	93.29%	93.29%	93.29%	93.29%	93.29%											
Benthic							66.51%	66.51%	66.51%	66.51%	66.51%	66.51%					
Aquatic Veg							31.95%	31.95%	31.95%	31.95%	31.95%	31.95%					
Browse													83.74%	78.26%	77.80%	73.55%	83.96%
Forage																	
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Merganser						Scaup						Hoary Marmot				
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.13%	2.92%	4.14%	3.17%	3.84%
Sediment	22.98%	22.98%	22.98%	22.98%	22.98%	22.98%	54.87%	54.87%	54.87%	54.87%	54.87%	54.87%	8.05%	19.22%	15.08%	36.29%	25.37%
Soil																	
Fish	77.00%	77.00%	77.00%	77.00%	77.00%	77.00%											
Benthic							44.47%	44.47%	44.47%	44.47%	44.47%	44.47%					
Aquatic Veg							0.65%	0.65%	0.65%	0.65%	0.65%	0.65%					
Browse													91.82%	77.87%	80.78%	60.55%	70.79%
Forage																	
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Percent Intake by Patl

Arsenic	Bear			Wolf	Mink						Beaver						Fox		
	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.56%	2.04%	2.31%	3.56%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%	0.98%	1.57%	1.56%	1.65%	0.70%	0.76%	1.30%	1.88%	1.91%
Sediment	42.48%	41.30%	42.29%	78.97%	31.20%	31.20%	31.20%	31.20%	31.20%	31.19%	51.45%	82.72%	81.86%	87.02%	36.73%	39.75%	28.68%	11.00%	10.09%
Soil	8.09%	29.67%	33.63%		13.82%	13.82%	13.82%	13.82%	13.82%	13.81%									
Fish					52.45%	52.45%	52.45%	52.45%	52.45%	52.45%									
Benthic					0.09%	0.09%	0.09%	0.09%	0.09%	0.09%									
Aquatic Veg											1.41%	2.27%	2.25%	2.39%	1.01%	1.09%			
Browse											46.16%	13.43%	14.34%	8.93%	61.56%	58.40%			
Forage	20.86%	19.15%	16.05%														10.61%	1.21%	0.80%
Berries	25.00%	7.22%	5.34%																
Lichen																			
Hare				0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%							0.08%	0.02%	0.02%
Moose	2.42%	0.50%	0.31%	13.96%															
Caribou	0.60%	0.12%	0.08%	3.45%															
Ducks					2.30%	2.30%	2.30%	2.30%	2.30%	2.30%							59.34%	85.89%	87.18%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Bear			Wolf	Mink						Beaver						Fox		
	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.27%	1.70%	1.40%	1.77%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.01%	0.02%	0.01%	0.02%	0.01%	0.01%	0.18%	0.25%	0.07%
Sediment	31.76%	4.97%	11.33%	16.20%	2.46%	2.19%	2.45%	2.42%	2.40%	2.37%	0.29%	0.39%	0.31%	0.39%	0.32%	0.29%	6.15%	0.21%	0.15%
Soil	13.82%	85.78%	70.52%		9.17%	8.16%	9.12%	9.03%	8.95%	8.83%									
Fish					23.62%	21.03%	23.49%	23.27%	23.05%	22.74%									
Benthic					62.33%	55.49%	62.00%	61.40%	60.82%	60.00%	73.17%	98.20%	78.91%	98.12%	82.29%	72.71%			
Aquatic Veg											26.53%	1.39%	20.76%	1.47%	17.37%	26.99%			
Browse																			
Forage	38.03%	4.02%	8.59%														0.77%	0.04%	0.04%
Berries	6.30%	1.41%	4.13%																
Lichen																			
Hare				0.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							0.04%	0.00%	0.00%
Moose	9.51%	2.06%	3.90%	79.36%															
Caribou	0.31%	0.07%	0.13%	2.59%															
Ducks					2.39%	13.11%	2.91%	3.84%	4.75%	6.03%							92.86%	99.51%	99.74%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Bear			Wolf	Mink						Beaver						Fox		
	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.18%	0.54%	0.56%	1.33%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.15%	0.30%	0.18%	0.29%	0.23%	0.23%	1.45%	2.80%	2.78%
Sediment	47.81%	47.82%	47.81%	15.69%	47.81%	47.82%	47.81%	47.82%	47.81%	47.81%	42.07%	86.18%	53.27%	85.25%	66.68%	65.48%	28.50%	4.33%	7.33%
Soil	12.02%	2.90%	5.09%		42.39%	42.39%	42.39%	42.39%	42.39%	42.39%									
Fish	28.23%	86.82%	89.08%		8.61%	8.61%	8.61%	8.61%	8.61%	8.61%									
Benthic					0.69%	0.69%	0.69%	0.69%	0.69%	0.69%	6.10%	12.50%	7.72%	12.36%	9.67%	9.49%			
Aquatic Veg											51.68%	1.03%	38.82%	2.10%	23.42%	24.80%			
Browse																			
Forage	31.59%	3.82%	2.33%														23.55%	4.02%	1.74%
Berries	15.80%	4.29%	1.92%																
Lichen																			
Hare				0.08%	0.02%	0.00%	0.01%	0.00%	0.01%	0.01%							0.61%	0.07%	0.06%
Moose	11.81%	1.58%	0.99%	80.28%															
Caribou	0.39%	0.05%	0.03%	2.62%															
Ducks					0.44%	0.44%	0.44%	0.44%	0.44%	0.44%							45.90%	88.78%	88.08%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.01%	0.62%	0.10%	0.03%	0.01%	0.01%	0.16%	1.34%	0.48%	0.08%	0.02%	0.00%	0.01%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
Sediment	32.73%	73.41%	80.03%	56.08%	78.85%	96.69%	20.82%	69.86%	65.13%	80.71%	42.86%	77.96%	97.02%	64.61%	64.61%	64.61%	64.61%	64.61%	64.61%
Soil																			
Fish																			
Benthic														23.44%	23.44%	23.44%	23.44%	23.44%	23.44%
Aquatic Veg							1.56%							11.88%	11.88%	11.88%	11.88%	11.88%	11.88%
Browse	0.38%	21.63%	10.48%	42.72%	12.68%	1.64%	77.46%		33.35%	18.37%	56.73%	21.78%	2.85%						
Forage	0.05%	4.34%	9.39%	1.17%	8.46%	1.66%		28.80%											
Berries									1.05%	0.84%	0.39%	0.25%	0.11%						
Lichen	66.82%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.04%	0.00%	0.59%	0.12%	0.16%	0.04%	0.33%	0.67%	0.00%	0.42%	0.13%	0.16%	0.04%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
Sediment	23.68%	6.71%	9.24%	5.30%	6.23%	2.51%	25.82%	5.68%	5.50%	7.58%	6.56%	7.29%	2.35%	13.52%	13.52%	13.52%	13.52%	13.52%	13.52%
Soil																			
Fish																			
Benthic														81.75%	81.75%	81.75%	81.75%	81.75%	81.75%
Aquatic Veg							3.66%							4.70%	4.70%	4.70%	4.70%	4.70%	4.70%
Browse	14.27%	65.23%	64.18%	36.80%	43.26%	58.88%	70.20%		92.93%	91.52%	79.14%	88.06%	95.80%						
Forage	1.96%	28.06%	25.99%	57.78%	50.35%	38.56%		93.65%											
Berries									1.58%	0.47%	14.17%	4.48%	1.81%						
Lichen	59.06%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	2.35%	0.05%	1.76%	0.73%	0.28%	0.15%	0.71%	2.35%	0.03%	1.27%	0.89%	0.18%	0.12%	0.13%	0.13%	0.13%	0.13%	0.13%	0.13%
Sediment	38.29%	13.39%	27.92%	20.78%	18.06%	8.22%	53.28%	1.63%	9.16%	23.07%	28.93%	13.25%	7.59%	59.71%	59.71%	59.71%	59.71%	59.71%	59.71%
Soil																			
Fish																			
Benthic														38.22%	38.22%	38.22%	38.22%	38.22%	38.22%
Aquatic Veg							0.71%							1.94%	1.94%	1.94%	1.94%	1.94%	1.94%
Browse	9.54%	75.11%	51.12%	25.72%	66.90%	53.83%	45.30%		89.26%	73.40%	62.23%	85.24%	86.35%						
Forage	0.83%	11.46%	19.19%	52.77%	14.76%	37.80%		96.02%											
Berries									1.55%	2.26%	7.96%	1.33%	5.94%						
Lichen	49.00%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Merganser						Scaup						Hoary Marmot				
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	1.32%	0.16%	0.10%	0.01%	0.03%
Sediment	64.16%	64.16%	64.16%	64.16%	64.16%	64.16%	86.51%	86.51%	86.51%	86.51%	86.51%	86.51%	76.97%	64.03%	90.89%	66.14%	92.43%
Soil																	
Fish	35.73%	35.73%	35.73%	35.73%	35.73%	35.73%											
Benthic							11.69%	11.69%	11.69%	11.69%	11.69%	11.69%					
Aquatic Veg							1.77%	1.77%	1.77%	1.77%	1.77%	1.77%					
Browse																	
Forage													21.71%	35.82%	9.00%	33.85%	7.55%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Merganser						Scaup						Hoary Marmot				
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.00%	0.90%	0.09%	0.13%	0.05%
Sediment	27.19%	27.19%	27.19%	27.19%	27.19%	27.19%	30.39%	30.39%	30.39%	30.39%	30.39%	30.39%	4.77%	6.87%	1.88%	2.52%	1.35%
Soil																	
Fish	72.73%	72.73%	72.73%	72.73%	72.73%	72.73%											
Benthic							68.42%	68.42%	68.42%	68.42%	68.42%	68.42%					
Aquatic Veg							1.18%	1.18%	1.18%	1.18%	1.18%	1.18%					
Browse																	
Forage													95.23%	92.23%	98.03%	97.34%	98.60%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Merganser						Scaup						Hoary Marmot				
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.18%	0.18%	0.18%	0.18%	0.18%	0.18%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.14%	2.91%	0.54%	0.64%	0.16%
Sediment	58.94%	58.94%	58.94%	58.94%	58.94%	58.94%	80.48%	80.48%	80.48%	80.48%	80.48%	80.48%	19.66%	22.69%	7.58%	20.29%	4.35%
Soil																	
Fish	40.89%	40.89%	40.89%	40.89%	40.89%	40.89%											
Benthic							19.19%	19.19%	19.19%	19.19%	19.19%	19.19%					
Aquatic Veg							0.29%	0.29%	0.29%	0.29%	0.29%	0.29%					
Browse																	
Forage													80.20%	74.40%	91.87%	79.06%	95.49%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Bear			Wolf	Mink						Beaver						Fox		
	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.09%	0.29%	0.02%	0.06%	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%	0.44%	0.18%	0.45%	0.42%	0.44%	0.36%	4.04%	1.12%	0.06%
Sediment	68.85%	78.08%	88.06%	95.52%	82.88%	79.02%	82.90%	82.72%	82.90%	82.27%	75.70%	30.75%	77.20%	73.36%	77.10%	63.17%	74.06%	86.06%	92.21%
Soil	17.30%	4.69%	0.24%		12.21%	11.64%	12.21%	12.19%	12.21%	12.12%									
Fish					2.49%	2.37%	2.49%	2.48%	2.49%	2.47%									
Benthic					2.07%	1.98%	2.07%	2.07%	2.07%	2.06%	18.92%	7.69%	19.30%	18.34%	19.28%	15.79%			
Aquatic Veg											4.94%	61.39%	3.06%	7.87%	3.18%	20.68%			
Browse																			
Forage	4.47%	15.07%	10.70%																
Berries	2.97%	1.40%	0.93%														2.01%	0.97%	0.61%
Lichen																			
Hare				2.42%	0.06%	4.72%	0.04%	0.26%	0.04%	0.80%							4.14%	7.47%	6.91%
Moose	0.90%	0.08%	0.01%	0.34%															
Caribou	4.41%	0.39%	0.05%	1.67%															
Ducks					0.16%	0.15%	0.16%	0.16%	0.16%	0.16%							15.75%	4.38%	0.22%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Bear			Wolf	Mink						Beaver						Fox		
	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.01%	0.83%	0.22%	5.24%	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%	0.05%	0.10%	0.02%	0.57%	0.02%	0.03%	0.14%	17.73%	4.81%
Sediment	15.60%	6.44%	9.26%	74.79%	44.26%	44.27%	44.26%	44.27%	44.25%	44.26%	4.96%	10.55%	2.45%	59.51%	1.63%	3.10%	67.02%	39.90%	58.50%
Soil	0.43%	38.02%	10.11%		31.33%	31.33%	31.32%	31.33%	31.32%	31.32%									
Fish					22.13%	22.13%	22.13%	22.13%	22.13%	22.13%									
Benthic					2.09%	2.09%	2.09%	2.09%	2.09%	2.09%	2.34%	4.98%	1.16%	28.10%	0.77%	1.47%			
Aquatic Veg											92.64%	84.37%	96.37%	11.82%	97.59%	95.40%			
Browse																			
Forage	71.76%	52.30%	73.29%																
Berries	12.01%	2.36%	6.96%														32.44%	9.18%	27.64%
Lichen																			
Hare				0.09%	0.01%	0.00%	0.02%	0.00%	0.04%	0.02%							0.15%	0.07%	0.07%
Moose	0.18%	0.06%	0.15%	18.98%															
Caribou	0.01%	0.00%	0.01%	0.90%															
Ducks					0.07%	0.07%	0.07%	0.07%	0.07%	0.07%							0.26%	33.12%	8.98%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Bear			Wolf	Mink						Beaver						Fox		
	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.24%	3.40%	1.11%	3.12%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%	0.29%	0.67%	0.62%	0.91%	0.23%	0.20%	1.05%	2.53%	2.06%
Sediment	37.46%	21.18%	37.95%	31.79%	78.45%	78.46%	78.46%	78.47%	78.44%	78.42%	28.08%	66.07%	61.35%	88.94%	22.37%	19.94%	47.35%	4.56%	20.28%
Soil	2.69%	38.31%	12.53%		14.40%	14.40%	14.40%	14.40%	14.40%	14.39%									
Fish					4.15%	4.15%	4.15%	4.15%	4.15%	4.15%									
Benthic					0.35%	0.35%	0.35%	0.35%	0.35%	0.35%	1.24%	2.91%	2.71%	3.92%	0.99%	0.88%			
Aquatic Veg											70.39%	30.35%	35.32%	6.23%	76.42%	78.98%			
Browse																			
Forage	35.21%	19.83%	33.31%																
Berries	17.06%	15.70%	11.38%														13.56%	2.13%	3.82%
Lichen																			
Hare				0.20%	0.03%	0.01%	0.01%	0.00%	0.04%	0.06%							0.62%	0.04%	0.20%
Moose	7.01%	1.50%	3.55%	62.04%															
Caribou	0.32%	0.07%	0.16%	2.85%															
Ducks					2.42%	2.42%	2.42%	2.42%	2.42%	2.42%							37.42%	90.74%	73.64%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Silver	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.32%	0.17%	0.61%	0.75%	0.29%	0.38%	0.97%	2.24%	0.14%	0.42%	0.69%	0.23%	0.45%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%
Sediment							3.78%							1.48%	1.48%	1.48%	1.48%	1.48%	1.48%
Soil	28.75%	81.79%	37.17%	70.00%	63.68%	35.87%		74.44%	78.70%	29.39%	73.93%	56.91%	48.31%						
Fish																			
Benthic																			
Aquatic Veg							64.36%							36.61%	36.61%	36.61%	36.61%	36.61%	36.61%
Browse	0.66%	10.85%	49.60%	8.60%	27.39%	19.68%	30.90%		18.15%	68.15%	15.78%	42.54%	46.06%	61.85%	61.85%	61.85%	61.85%	61.85%	61.85%
Forage	0.08%	7.19%	12.62%	20.65%	8.64%	44.06%		23.31%											
Berries									3.01%	2.03%	9.59%	0.33%	5.18%						
Lichen	70.19%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water																			
Sediment																			
Soil																			
Fish																			
Benthic																			
Aquatic Veg																			
Browse	0.49%	64.82%	66.90%	67.54%	17.23%	75.52%	100.00%		92.59%	94.96%	95.62%	93.51%	94.00%						
Forage	0.26%	35.18%	33.10%	32.46%	82.77%	24.48%		100.00%	7.41%	5.04%	4.38%	6.49%	6.00%						
Berries																			
Lichen	99.25%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	n/a	n/a	n/a	n/a	n/a	n/a

Tin	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water																			
Sediment																			
Soil	16.58%	32.74%	59.17%	49.51%	56.21%	60.26%		60.77%	32.20%	47.43%	24.38%	42.70%	69.35%						
Fish																			
Benthic																			
Aquatic Veg																			
Browse	0.45%	38.46%	37.37%	31.27%	35.50%	14.41%	100.00%		65.73%	52.05%	26.75%	46.86%	28.81%						
Forage	0.09%	28.80%	3.46%	19.21%	8.30%	25.33%		39.23%											
Berries									2.07%	0.52%	48.87%	10.44%	1.84%						
Lichen	82.88%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	n/a	n/a	n/a	n/a	n/a	n/a

Pct by Pathway

Silver	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%	0.29%	1.27%	0.90%	0.56%	0.32%
Sediment	1.02%	1.02%	1.02%	1.02%	1.02%	1.02%	6.72%	6.72%	6.72%	6.72%	6.72%	6.72%	70.25%	37.70%	41.17%	60.37%	14.54%
Soil																	
Fish	98.92%	98.92%	98.92%	98.92%	98.92%	98.92%											
Benthic							61.91%	61.91%	61.91%	61.91%	61.91%	61.91%					
Aquatic Veg							31.30%	31.30%	31.30%	31.30%	31.30%	31.30%					
Browse																	
Forage													29.46%	61.03%	57.93%	39.07%	85.15%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water																	
Sediment																	
Soil																	
Fish																	
Benthic																	
Aquatic Veg																	
Browse																	
Forage													100.00%	100.00%	100.00%	100.00%	100.00%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100.00%	100.00%	100.00%	100.00%	100.00%

Tin	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water																	
Sediment													19.25%	78.18%	35.08%	58.69%	33.28%
Soil																	
Fish																	
Benthic																	
Aquatic Veg																	
Browse																	
Forage													80.75%	21.82%	64.92%	41.31%	66.72%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Silver	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.25%	0.78%	0.53%	1.49%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%	0.32%	0.32%	0.34%	0.32%	0.32%	0.06%	0.85%	2.20%	1.60%
Sediment					2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	1.65%	1.64%	1.71%	1.65%	1.65%	0.31%			
Soil	65.61%	25.08%	48.69%	82.67%													65.43%	20.60%	42.79%
Fish	20.07%	62.89%	42.63%		73.21%	73.21%	73.21%	73.21%	73.21%	73.13%									
Benthic					5.86%	5.86%	5.86%	5.86%	5.86%	5.85%									
Aquatic Veg					16.28%	16.28%	16.28%	16.28%	16.28%	16.26%	93.67%	93.31%	97.38%	93.78%	93.67%	17.47%			
Browse											4.36%	4.73%	0.57%	4.24%	4.36%	82.16%			
Forage	6.34%	8.36%	6.85%														4.23%	1.27%	0.48%
Berries	6.74%	2.46%	0.87%																
Lichen																			
Hare				0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.11%							0.07%	0.05%	0.08%
Moose	0.68%	0.29%	0.31%	10.85%															
Caribou	0.31%	0.13%	0.14%	4.93%															
Ducks					1.65%	1.65%	1.65%	1.65%	1.65%	1.64%							29.42%	75.88%	55.06%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water																			
Sediment																			
Soil																			
Fish																			
Benthic																			
Aquatic Veg																			
Browse											100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			
Forage	51.82%	56.71%	90.84%														94.54%	95.94%	78.31%
Berries	32.46%	33.91%	6.25%																
Lichen																			
Hare				0.44%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%							5.46%	4.06%	21.69%
Moose	5.29%	3.15%	0.98%	33.46%															
Caribou	10.44%	6.23%	1.93%	66.09%															
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Tin	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water																			
Sediment																			
Soil	43.94%	76.27%	63.96%	39.65%													88.09%	92.57%	82.91%
Fish																			
Benthic																			
Aquatic Veg																			
Browse											100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			
Forage	42.47%	11.60%	10.35%														9.54%	5.29%	15.95%
Berries	7.57%	6.93%	19.57%																
Lichen																			
Hare				0.39%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%							2.37%	2.14%	1.14%
Moose	1.90%	1.65%	1.93%	18.97%															
Caribou	4.11%	3.56%	4.18%	40.99%															
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	3.86%	0.01%	4.40%	3.01%	0.91%	1.22%	0.64%	17.38%	0.00%	5.33%	1.89%	0.55%	0.70%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Sediment																			
Soil	18.23%	4.45%	7.54%	7.82%	11.87%	9.48%	22.20%	12.79%	2.89%	10.48%	5.63%	8.13%	6.20%	2.27%	2.27%	2.27%	2.27%	2.27%	2.27%
Fish																			
Benthic																			
Aquatic Veg							54.80%							83.99%	83.99%	83.99%	83.99%	83.99%	83.99%
Browse	8.62%	85.70%	34.51%	73.59%	76.33%	81.45%	22.36%		96.66%	83.28%	92.00%	90.90%	92.55%	13.73%	13.73%	13.73%	13.73%	13.73%	13.73%
Forage	0.42%	9.85%	53.54%	15.58%	10.89%	7.84%													
Berries								69.83%											
Lichen	68.87%								0.45%	0.91%	0.49%	0.42%	0.55%						
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Merganser						Scaup						Hoary Marmot				
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.02%	3.29%	6.93%	2.83%	5.04%
Sediment	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	6.47%	6.47%	6.47%	6.47%	6.47%	6.47%	8.65%	2.78%	8.86%	18.08%	19.20%
Soil																	
Fish	97.08%	97.08%	97.08%	97.08%	97.08%	97.08%											
Benthic							89.16%	89.16%	89.16%	89.16%	89.16%	89.16%					
Aquatic Veg							4.36%	4.36%	4.36%	4.36%	4.36%	4.36%					
Browse																	
Forage													91.33%	93.93%	84.21%	79.09%	75.77%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Bear			Wolf	Mink						Beaver						Fox		
	Bkgd	Van-M	Faro-M		Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.01%	0.37%	0.35%	0.26%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.10%	0.23%	0.05%	0.23%	0.03%	0.10%	0.11%	0.15%	0.15%
Sediment					6.66%	6.68%	6.65%	6.68%	6.61%	6.66%	4.41%	10.49%	2.49%	10.72%	1.23%	4.79%			
Soil	3.12%	0.25%	1.83%	0.77%													14.09%	0.03%	0.23%
Fish	1.75%	93.63%	87.01%		58.94%	59.05%	58.79%	59.05%	58.45%	58.94%									
Benthic					20.40%	20.44%	20.35%	20.44%	20.23%	20.40%									
Aquatic Veg					5.48%	5.49%	5.47%	5.49%	5.44%	5.48%	36.28%	86.34%	20.50%	88.24%	10.10%	39.42%			
Browse											59.21%	2.94%	76.95%	0.80%	88.65%	55.69%			
Forage	7.58%	2.32%	1.92%														3.69%	0.01%	0.02%
Berries	1.30%	0.09%	0.28%																
Lichen																			
Hare				0.12%	0.19%	0.01%	0.44%	0.00%	1.02%	0.19%							9.29%	0.02%	0.07%
Moose	84.13%	3.27%	8.39%	96.43%															
Caribou	2.11%	0.08%	0.21%	2.42%															
Ducks					8.29%	8.30%	8.27%	8.30%	8.22%	8.29%							72.83%	99.80%	99.53%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

APPENDIX F-3

NO INTERVENTION FUTURE 3 SCENARIO

**(SUMMARY TERRESTRIAL ECOLOGICAL
RECEPTOR RESULTS)**

by Pathway

Intake by Pathway (mg/kg d)

Arsenic	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	2.48E-03	5.35E-05	9.47E-04	2.87E-02	2.87E-02	2.87E-02	2.86E-03	5.05E-04	4.35E-05	7.69E-04	2.33E-02	2.33E-02	2.33E-02
Sediment							1.15E-01						
Soil	9.88E-03	7.64E-03	5.69E-02	1.77E-02	8.22E-02	8.27E-02		8.07E-04	7.11E-03	5.29E-02	1.65E-02	7.65E-02	7.69E-02
Fish													
Benthic							9.47E-04						
Aquatic Veg							1.34E-02						
Browse	7.40E-04	2.31E-02	2.50E-02	2.50E-02	1.01E-01	3.19E-02		9.92E-03	3.73E-02	4.04E-02	4.04E-02	1.64E-01	5.16E-02
Forage	4.76E-05	3.41E-03	1.61E-02	2.05E-03	2.51E-02	8.26E-03			1.56E-03	5.49E-03	2.79E-04	3.33E-03	3.88E-04
Berries													
Lichen	2.68E-02												
Hare													
Moose													
Caribou													
Ducks													
Total	3.99E-02	3.42E-02	9.89E-02	7.35E-02	2.37E-01	1.52E-01	1.32E-01	1.12E-02	4.60E-02	9.96E-02	8.05E-02	2.67E-01	1.52E-01

Cadmium	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	1.36E-03	4.64E-05	8.46E-03	8.09E-03	8.09E-03	8.09E-03	1.57E-03	2.94E-03	3.77E-05	6.87E-03	6.57E-03	6.57E-03	6.57E-03
Sediment							2.60E-02						
Soil	2.46E-03	1.00E-02	5.30E-03	1.75E-02	1.08E-02	7.79E-03		9.69E-04	9.35E-03	4.93E-03	1.62E-02	1.00E-02	7.25E-03
Fish													
Benthic							1.97E+00						
Aquatic Veg							5.68E-02						
Browse	3.14E-03	2.63E-01	2.02E-01	3.60E-02	2.33E-01	2.93E-01		3.31E-03	4.25E-01	3.26E-01	5.82E-02	3.77E-01	4.74E-01
Forage	2.66E-05	1.09E-02	6.05E-03	1.37E-02	6.97E-03	9.84E-03			6.90E-04	2.07E-03	7.99E-04	1.28E-03	3.59E-03
Berries													
Lichen	5.41E-03												
Hare													
Moose													
Caribou													
Ducks													
Total	1.24E-02	2.84E-01	2.22E-01	7.52E-02	2.59E-01	3.19E-01	2.06E+00	7.22E-03	4.35E-01	3.40E-01	8.18E-02	3.95E-01	4.91E-01

Copper	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	3.16E-02	4.63E-04	1.73E-01	2.13E-01	2.13E-01	2.13E-01	3.65E-02	6.00E-02	3.76E-04	1.40E-01	1.73E-01	1.73E-01	1.73E-01
Sediment							8.04E+00						
Soil	4.54E-02	5.89E-02	1.43E-01	1.29E-01	4.06E-01	2.34E-01		9.69E-03	5.48E-02	1.33E-01	1.20E-01	3.78E-01	2.18E-01
Fish													
Benthic							3.50E-01						
Aquatic Veg							7.07E-02						
Browse	3.90E-03	2.30E-01	2.99E-01	2.27E-01	3.17E-01	2.89E-01		2.08E-01	3.71E-01	4.83E-01	3.66E-01	5.13E-01	4.68E-01
Forage	5.77E-04	1.41E-01	1.21E-01	1.45E-01	1.42E-01	1.37E-01			2.68E-02	5.95E-02	7.72E-02	4.15E-02	5.98E-02
Berries													
Lichen	8.05E-02												
Hare													
Moose													
Caribou													
Ducks													
Total	1.62E-01	4.30E-01	7.35E-01	7.14E-01	1.08E+00	8.73E-01	8.49E+00	2.78E-01	4.53E-01	8.16E-01	7.37E-01	1.11E+00	9.19E-01

by Pathway

Intake by Pathway (n

Arsenic							Merganser						Scaup				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S
Water	3.09E-05	8.88E-03	1.58E-04	2.93E-04	1.66E-05	7.82E-05	2.78E-05	8.00E-03	1.43E-04	2.64E-04	1.49E-05	7.04E-05	3.41E-05	9.81E-03	1.75E-04	3.23E-04	1.83E-05
Sediment	7.71E-03	2.22E+00	3.95E-02	7.31E-02	4.13E-03	1.95E-02	5.00E-03	1.44E+00	2.56E-02	4.74E-02	2.68E-03	1.26E-02	3.35E-02	9.61E+00	1.71E-01	3.17E-01	1.79E-02
Soil																	
Fish							8.37E-03	2.40E+00	4.29E-02	7.93E-02	4.48E-03	2.12E-02					
Benthic	1.57E-01	4.51E+01	8.03E-01	1.49E+00	8.40E-02	3.97E-01							2.53E-01	7.28E+01	1.30E+00	2.40E+00	1.36E-01
Aquatic Veg	1.56E-04	4.48E-02	7.98E-04	1.48E-03	8.34E-05	3.94E-04							7.54E-05	2.16E-02	3.86E-04	7.14E-04	4.03E-05
Browse																	
Forage																	
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	1.65E-01	4.73E+01	8.44E-01	1.56E+00	8.82E-02	4.17E-01	1.34E-02	3.85E+00	6.86E-02	1.27E-01	7.17E-03	3.39E-02	2.87E-01	8.24E+01	1.47E+00	2.72E+00	1.54E-01

Cadmium							Merganser						Scaup				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S
Water	8.35E-06	2.50E-03	1.15E-05	2.62E-03	1.44E-05	3.66E-05	7.52E-06	2.25E-03	1.04E-05	2.36E-03	1.29E-05	3.29E-05	9.23E-06	2.76E-03	1.27E-05	2.89E-03	1.59E-05
Sediment	8.59E-04	2.57E-01	1.18E-03	2.69E-01	1.48E-03	3.76E-03	5.57E-04	1.67E-01	7.67E-04	1.74E-01	9.57E-04	2.44E-03	3.73E-03	1.12E+00	5.13E-03	1.17E+00	6.40E-03
Soil																	
Fish							7.84E-03	2.35E+00	1.08E-02	2.46E+00	1.35E-02	3.43E-02					
Benthic	9.97E-02	2.98E+01	1.37E-01	3.12E+01	1.71E-01	4.37E-01							1.61E-01	4.82E+01	2.22E-01	5.04E+01	2.77E-01
Aquatic Veg	1.60E-01	4.79E+01	2.20E-01	5.01E+01	2.75E-01	7.01E-01							7.74E-02	2.32E+01	1.07E-01	2.42E+01	1.33E-01
Browse																	
Forage																	
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	2.61E-01	7.80E+01	3.59E-01	8.16E+01	4.48E-01	1.14E+00	8.41E-03	2.52E+00	1.16E-02	2.63E+00	1.44E-02	3.68E-02	2.42E-01	7.25E+01	3.34E-01	7.58E+01	4.16E-01

Copper							Merganser						Scaup				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S
Water	4.09E-05	6.58E-02	6.89E-05	5.35E-02	1.43E-04	8.29E-04	3.68E-05	5.92E-02	6.21E-05	4.82E-02	1.29E-04	7.47E-04	4.52E-05	7.26E-02	7.62E-05	5.91E-02	1.58E-04
Sediment	5.61E-02	9.02E+01	9.45E-02	7.34E+01	1.96E-01	1.14E+00	3.64E-02	5.85E+01	6.13E-02	4.76E+01	1.27E-01	7.37E-01	2.43E-01	3.91E+02	4.10E-01	3.18E+02	8.51E-01
Soil																	
Fish							1.22E-01	1.96E+02	2.05E-01	1.59E+02	4.26E-01	2.47E+00					
Benthic	1.22E-01	1.96E+02	2.06E-01	1.60E+02	4.27E-01	2.47E+00							1.97E-01	3.17E+02	3.32E-01	2.58E+02	6.90E-01
Aquatic Veg	5.98E-03	9.61E+00	1.01E-02	7.82E+00	2.09E-02	1.21E-01							2.89E-03	4.65E+00	4.87E-03	3.78E+00	1.01E-02
Browse																	
Forage																	
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	1.84E-01	2.96E+02	3.10E-01	2.41E+02	6.44E-01	3.73E+00	1.58E-01	2.54E+02	2.67E-01	2.07E+02	5.53E-01	3.21E+00	4.43E-01	7.13E+02	7.47E-01	5.80E+02	1.55E+00

by Pathway

Intake by Pathway (n

Arsenic		Hoary Marmot					Bear			Wolf	Mink					
Pathway	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	8.64E-05	4.87E-05	8.61E-04	2.61E-02	2.61E-02	2.61E-02	3.42E-05	6.06E-04	1.84E-02	9.32E-04	1.07E-04	3.06E-02	5.46E-04	1.01E-03	5.71E-05	2.70E-04
Sediment	8.46E-02										2.16E-02	6.19E+00	1.10E-01	2.04E-01	1.15E-02	5.45E-02
Soil		3.42E-03	2.55E-02	7.93E-03	3.68E-02	3.70E-02	2.61E-03	1.23E-02	2.05E-02	2.32E-03						
Fish							4.98E-04	8.81E-03	2.67E-01		9.55E-03	2.74E+00	4.89E-02	9.04E-02	5.11E-03	2.42E-02
Benthic	6.41E-01										3.63E-02	1.04E+01	1.86E-01	3.43E-01	1.94E-02	9.17E-02
Aquatic Veg	1.91E-04										5.92E-05	1.70E-02	3.03E-04	5.61E-04	3.17E-05	1.50E-04
Browse																
Forage		7.28E-03	3.43E-02	4.37E-03	5.36E-02	1.76E-02	1.28E-03	5.69E-03	7.79E-03							
Berries							1.54E-03	2.14E-03	2.59E-03							
Lichen										2.03E-06	1.05E-06	7.30E-06	1.05E-06	3.05E-06	1.05E-06	3.05E-06
Hare										2.03E-03						
Moose							7.36E-04	7.36E-04	7.36E-04	1.07E-04						
Caribou							3.89E-05	3.89E-05	3.89E-05							
Ducks											1.59E-03	4.56E-01	8.13E-03	1.50E-02	8.50E-04	4.01E-03
Total	7.26E-01	1.08E-02	6.06E-02	3.84E-02	1.16E-01	8.08E-02	6.74E-03	3.03E-02	3.17E-01	5.39E-03	6.91E-02	1.99E+01	3.54E-01	6.55E-01	3.70E-02	1.75E-01

Cadmium		Hoary Marmot					Bear			Wolf	Mink					
Pathway	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	4.04E-05	4.22E-05	7.69E-03	7.36E-03	7.36E-03	7.36E-03	2.97E-05	5.41E-03	5.17E-03	5.11E-04	2.88E-05	8.63E-03	3.97E-05	9.02E-03	4.95E-05	1.26E-04
Sediment	1.63E-02										2.40E-03	7.19E-01	3.31E-03	7.52E-01	4.13E-03	1.05E-02
Soil		4.50E-03	2.37E-03	7.81E-03	4.82E-03	3.49E-03	3.44E-03	2.49E-03	3.00E-03	5.79E-04						
Fish							1.50E-03	2.73E-01	2.61E-01		8.95E-03	2.68E+00	1.23E-02	2.80E+00	1.54E-02	3.92E-02
Benthic	7.05E-01										2.30E-02	6.90E+00	3.18E-02	7.22E+00	3.96E-02	1.01E-01
Aquatic Veg	3.39E-01										6.08E-02	1.82E+01	8.38E-02	1.90E+01	1.05E-01	2.66E-01
Browse																
Forage		2.34E-02	1.29E-02	2.92E-02	1.49E-02	2.10E-02	4.12E-03	2.01E-03	2.27E-03							
Berries							6.82E-04	7.04E-04	1.09E-03							
Lichen										3.39E-06	3.44E-06	8.63E-06	3.44E-06	5.89E-06	3.44E-06	5.89E-06
Hare										3.39E-02						
Moose							1.23E-02	1.23E-02	1.23E-02	1.13E-04						
Caribou							4.10E-05	4.10E-05	4.10E-05							
Ducks											2.33E-03	3.75E+00	3.93E-03	3.05E+00	8.16E-03	4.73E-02
Total	1.06E+00	2.79E-02	2.30E-02	4.44E-02	2.71E-02	3.18E-02	2.21E-02	2.96E-01	2.85E-01	3.51E-02	9.76E-02	3.23E+01	1.35E-01	3.29E+01	1.72E-01	4.64E-01

Copper		Hoary Marmot					Bear			Wolf	Mink					
Pathway	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	9.16E-04	4.21E-04	1.57E-01	1.93E-01	1.93E-01	1.93E-01	2.96E-04	1.11E-01	1.36E-01	1.19E-02	1.41E-04	2.27E-01	2.38E-04	1.85E-01	4.93E-04	2.86E-03
Sediment	4.93E+00										1.57E-01	2.52E+02	2.64E-01	2.05E+02	5.48E-01	3.18E+00
Soil		2.63E-02	6.38E-02	5.78E-02	1.82E-01	1.05E-01	2.01E-02	3.64E-02	1.02E-01	1.07E-02						
Fish							4.73E-02	1.77E+01	2.18E+01		1.39E-01	2.23E+02	2.34E-01	1.82E+02	4.86E-01	2.82E+00
Benthic	4.00E+00										2.82E-02	4.54E+01	4.76E-02	3.69E+01	9.87E-02	5.72E-01
Aquatic Veg	5.86E-02										2.27E-03	3.65E+00	3.83E-03	2.97E+00	7.95E-03	4.61E-02
Browse																
Forage		3.00E-01	2.58E-01	3.10E-01	3.03E-01	2.93E-01	5.30E-02	4.79E-02	4.67E-02							
Berries							2.65E-02	5.38E-02	3.84E-02							
Lichen										6.52E-05	6.62E-05	1.66E-04	6.62E-05	1.13E-04	6.62E-05	1.13E-04
Hare										6.52E-01						
Moose							2.36E-01	2.36E-01	2.36E-01	2.17E-03						
Caribou							7.89E-04	7.89E-04	7.89E-04							
Ducks											1.46E-03	2.34E+00	2.46E-03	1.91E+00	5.10E-03	2.96E-02
Total	8.99E+00	3.27E-01	4.80E-01	5.61E-01	6.79E-01	5.91E-01	3.84E-01	1.82E+01	2.23E+01	6.77E-01	3.28E-01	5.27E+02	5.53E-01	4.29E+02	1.15E+00	6.65E+00

by Pathway

Intake by Pathway (n

Arsenic	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	7.76E-05	2.23E-02	3.98E-04	7.35E-04	4.16E-05	1.96E-04	4.91E-05	8.68E-04	2.63E-02
Sediment	4.08E-03	1.17E+00	2.09E-02	3.87E-02	2.19E-03	1.03E-02			
Soil							1.08E-03	5.08E-03	8.51E-03
Fish									
Benthic									
Aquatic Veg	1.12E-04	3.22E-02	5.75E-04	1.06E-03	6.01E-05	2.84E-04			
Browse	3.66E-03	1.16E-02	3.66E-03	3.97E-03	3.66E-03	3.97E-03			
Forage									
Berries							4.01E-04	5.58E-04	6.75E-04
Lichen									
Hare							2.84E-06	8.23E-06	1.97E-05
Moose									
Caribou									
Ducks							2.24E-03	3.97E-02	1.20E+00
Total	7.94E-03	1.24E+00	2.56E-02	4.45E-02	5.95E-03	1.48E-02	3.78E-03	4.62E-02	1.24E+00

Cadmium	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	2.10E-05	6.28E-03	2.89E-05	6.57E-03	3.60E-05	9.19E-05	4.26E-05	7.76E-03	7.42E-03
Sediment	4.55E-04	1.36E-01	6.27E-04	1.42E-01	7.81E-04	1.99E-03			
Soil							1.43E-03	1.03E-03	1.24E-03
Fish									
Benthic									
Aquatic Veg	1.15E-01	3.45E+01	1.59E-01	3.61E+01	1.98E-01	5.04E-01			
Browse	4.18E-02	3.50E-02	4.18E-02	8.53E-02	4.18E-02	8.53E-02			
Forage									
Berries							1.78E-04	1.84E-04	2.85E-04
Lichen									
Hare							9.30E-06	1.59E-05	2.33E-05
Moose									
Caribou									
Ducks							2.15E-02	8.05E+00	9.90E+00
Total	1.57E-01	3.47E+01	2.01E-01	3.63E+01	2.41E-01	5.92E-01	2.32E-02	8.06E+00	9.90E+00

Copper	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.03E-04	1.65E-01	1.73E-04	1.34E-01	3.59E-04	2.08E-03	4.24E-04	1.59E-01	1.95E-01
Sediment	2.97E-02	4.77E+01	5.00E-02	3.88E+01	1.04E-01	6.02E-01			
Soil							8.35E-03	1.51E-02	4.22E-02
Fish									
Benthic									
Aquatic Veg	4.30E-03	6.92E+00	7.26E-03	5.63E+00	1.51E-02	8.73E-02			
Browse	3.65E-02	4.66E-02	3.65E-02	5.88E-02	3.65E-02	5.88E-02			
Forage									
Berries							6.90E-03	1.40E-02	1.00E-02
Lichen									
Hare							1.79E-04	3.06E-04	4.49E-04
Moose									
Caribou									
Ducks							1.35E-02	5.03E+00	6.18E+00
Total	7.06E-02	5.49E+01	9.39E-02	4.47E+01	1.56E-01	7.50E-01	2.93E-02	5.22E+00	6.43E+00

by Pathway

Lead	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	6.03E-04	3.96E-04	3.25E-03	2.71E-03	2.71E-03	2.71E-03	6.95E-04	1.27E-03	3.21E-04	2.64E-03	2.20E-03	2.20E-03	2.20E-03
Sediment							9.20E-02						
Soil	6.91E-01	4.69E-02	1.01E+00	9.32E-01	8.20E+00	3.73E+00		2.91E-02	4.37E-02	9.38E-01	8.68E-01	7.63E+00	3.47E+00
Fish													
Benthic							6.90E-03						
Aquatic Veg							1.46E-01						
Browse	8.09E-03	1.38E-02	1.32E-01	7.10E-01	1.32E+00	6.31E-02			2.24E-02	2.13E-01	1.15E+00	2.13E+00	1.02E-01
Forage	1.04E-03	2.77E-03	1.18E-01	1.94E-02	8.80E-01	6.39E-02		1.20E-02					
Berries									7.02E-04	9.71E-03	7.98E-03	2.46E-02	3.96E-03
Lichen	1.41E+00												
Hare													
Moose													
Caribou													
Ducks													
Total	2.11E+00	6.39E-02	1.26E+00	1.66E+00	1.04E+01	3.86E+00	2.46E-01	4.23E-02	6.70E-02	1.16E+00	2.03E+00	9.79E+00	3.58E+00

Manganese	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	2.79E-01	1.30E-03	2.60E+00	8.21E-01	8.21E-01	8.21E-01	3.22E-01	9.00E-01	1.06E-03	2.11E+00	6.66E-01	6.66E-01	6.66E-01
Sediment							2.55E+01						
Soil	7.58E-01	4.07E+00	5.63E+00	1.67E+00	1.49E+00	2.18E+00		1.07E+00	3.79E+00	5.24E+00	1.56E+00	1.39E+00	2.03E+00
Fish													
Benthic							3.62E+00						
Aquatic Veg							8.27E+00						
Browse	4.57E-01	3.96E+01	3.91E+01	1.16E+01	1.04E+01	5.10E+01		1.77E+01	6.41E+01	6.33E+01	1.88E+01	1.68E+01	8.24E+01
Forage	6.27E-02	1.70E+01	1.59E+01	1.83E+01	1.21E+01	3.34E+01			1.09E+00	3.26E-01	3.37E+00	8.54E-01	1.55E+00
Berries													
Lichen	1.89E+00												
Hare													
Moose													
Caribou													
Ducks													
Total	3.45E+00	6.08E+01	6.32E+01	3.24E+01	2.48E+01	8.74E+01	3.78E+01	1.97E+01	6.90E+01	7.10E+01	2.44E+01	1.97E+01	8.67E+01

Nickel	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	2.63E-03	9.29E-05	2.31E-02	8.31E-03	8.31E-03	8.31E-03	3.03E-03	8.17E-03	7.54E-05	1.87E-02	6.75E-03	6.75E-03	6.75E-03
Sediment							2.27E-01						
Soil	1.05E-02	2.72E-02	9.78E-02	2.42E-02	5.45E-02	4.66E-02		1.61E-03	2.53E-02	9.11E-02	2.26E-02	5.07E-02	4.34E-02
Fish													
Benthic							3.00E-03						
Aquatic Veg							4.72E-02						
Browse	2.61E-03	1.52E-01	1.79E-01	3.00E-02	2.02E-01	3.05E-01		9.51E-02	2.46E-01	2.90E-01	4.85E-02	3.26E-01	4.94E-01
Forage	2.27E-04	2.32E-02	6.73E-02	6.16E-02	4.45E-02	2.14E-01			4.29E-03	8.91E-03	6.20E-03	5.09E-03	3.40E-02
Berries													
Lichen	1.34E-02												
Hare													
Moose													
Caribou													
Ducks													
Total	2.93E-02	2.03E-01	3.67E-01	1.24E-01	3.09E-01	5.75E-01	2.80E-01	1.05E-01	2.76E-01	4.08E-01	8.40E-02	3.89E-01	5.78E-01

by Pathway

Lead	Mallard						Merganser						Scaup				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S
Water	7.72E-05	8.37E-04	1.27E-04	1.00E-03	1.22E-04	1.28E-04	6.95E-05	7.54E-04	1.15E-04	9.04E-04	1.10E-04	1.15E-04	8.53E-05	9.25E-04	1.41E-04	1.11E-03	1.35E-04
Sediment	6.35E-02	6.89E-01	1.05E-01	8.26E-01	1.01E-01	1.05E-01	4.12E-02	4.46E-01	6.79E-02	5.35E-01	6.52E-02	6.81E-02	2.75E-01	2.99E+00	4.54E-01	3.58E+00	4.37E-01
Soil																	
Fish							2.29E-02	2.49E-01	3.78E-02	2.98E-01	3.63E-02	3.79E-02					
Benthic	2.30E-02	2.50E-01	3.80E-02	3.00E-01	3.65E-02	3.81E-02							3.72E-02	4.04E-01	6.14E-02	4.84E-01	5.90E-02
Aquatic Veg	1.17E-02	1.27E-01	1.93E-02	1.52E-01	1.85E-02	1.93E-02							5.64E-03	6.12E-02	9.31E-03	7.34E-02	8.95E-03
Browse																	
Forage																	
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	9.83E-02	1.07E+00	1.62E-01	1.28E+00	1.56E-01	1.63E-01	6.41E-02	6.96E-01	1.06E-01	8.34E-01	1.02E-01	1.06E-01	3.18E-01	3.45E+00	5.25E-01	4.14E+00	5.05E-01

Manganese	Mallard						Merganser						Scaup				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S
Water	1.29E-03	2.54E-01	6.12E-04	8.03E-01	4.02E-04	3.54E-03	1.16E-03	2.28E-01	5.51E-04	7.23E-01	3.62E-04	3.19E-03	1.43E-03	2.80E-01	6.76E-04	8.87E-01	4.44E-04
Sediment	6.37E-01	1.25E+02	3.02E-01	3.96E+02	1.98E-01	1.75E+00	4.13E-01	8.12E+01	1.96E-01	2.57E+02	1.29E-01	1.13E+00	2.76E+00	5.43E+02	1.31E+00	1.72E+03	8.60E-01
Soil																	
Fish							1.10E+00	2.17E+02	5.24E-01	6.87E+02	3.44E-01	3.03E+00					
Benthic	3.85E+00	7.57E+02	1.83E+00	2.40E+03	1.20E+00	1.06E+01							6.22E+00	1.22E+03	2.95E+00	3.87E+03	1.94E+00
Aquatic Veg	2.21E-01	4.35E+01	1.05E-01	1.38E+02	6.89E-02	6.07E-01							1.07E-01	2.10E+01	5.07E-02	6.66E+01	3.33E-02
Browse																	
Forage																	
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	4.71E+00	9.26E+02	2.23E+00	2.93E+03	1.47E+00	1.29E+01	1.52E+00	2.99E+02	7.20E-01	9.45E+02	4.73E-01	4.17E+00	9.09E+00	1.79E+03	4.31E+00	5.66E+03	2.83E+00

Nickel	Mallard						Merganser						Scaup				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S
Water	3.91E-05	2.57E-03	1.70E-04	7.13E-03	2.87E-05	5.88E-05	3.52E-05	2.31E-03	1.53E-04	6.42E-03	2.59E-05	5.30E-05	4.32E-05	2.84E-03	1.88E-04	7.87E-03	3.17E-05
Sediment	1.82E-02	1.20E+00	7.94E-02	3.32E+00	1.34E-02	2.74E-02	1.18E-02	7.76E-01	5.15E-02	2.15E+00	8.67E-03	1.78E-02	7.91E-02	5.20E+00	3.44E-01	1.44E+01	5.80E-02
Soil																	
Fish							8.20E-03	5.39E-01	3.57E-02	1.49E+00	6.02E-03	1.23E-02					
Benthic	1.17E-02	7.67E-01	5.08E-02	2.13E+00	8.56E-03	1.76E-02							1.89E-02	1.24E+00	8.21E-02	3.44E+00	1.38E-02
Aquatic Veg	5.92E-04	3.88E-02	2.58E-03	1.08E-01	4.34E-04	8.89E-04							2.86E-04	1.88E-02	1.25E-03	5.21E-02	2.10E-04
Browse																	
Forage																	
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	3.05E-02	2.01E+00	1.33E-01	5.56E+00	2.24E-02	4.59E-02	2.01E-02	1.32E+00	8.73E-02	3.65E+00	1.47E-02	3.02E-02	9.83E-02	6.46E+00	4.28E-01	1.79E+01	7.21E-02

by Pathway

Lead		Hoary Marmot					Bear			Wolf	Mink					
Pathway	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.41E-04	3.60E-04	2.95E-03	2.46E-03	2.46E-03	2.46E-03	2.53E-04	2.08E-03	1.73E-03	2.26E-04	2.66E-04	2.89E-03	4.39E-04	3.46E-03	4.22E-04	4.41E-04
Sediment	4.56E-01										1.77E-01	1.92E+00	2.93E-01	2.31E+00	2.81E-01	2.94E-01
Soil		2.10E-02	4.51E-01	4.17E-01	3.67E+00	1.67E+00	1.61E-02	2.04E-01	1.95E+00	1.62E-01						
Fish							4.04E-03	3.31E-02	2.76E-02		2.61E-02	2.84E-01	4.31E-02	3.40E-01	4.14E-02	4.33E-02
Benthic	6.16E-02										5.32E-03	5.77E-02	8.78E-03	6.93E-02	8.44E-03	8.81E-03
Aquatic Veg	9.34E-03										4.44E-03	4.81E-02	7.32E-03	5.77E-02	7.03E-03	7.34E-03
Browse																
Forage		5.92E-03	2.52E-01	4.13E-02	1.88E+00	1.36E-01	1.04E-03	3.93E-02	2.37E-01							
Berries							6.93E-04	3.65E-03	2.06E-02							
Lichen										4.11E-03	1.38E-04	2.24E-02	1.38E-04	2.72E-03	1.38E-04	2.72E-03
Hare										7.55E-04						
Moose							2.74E-04	2.74E-04	2.74E-04	2.83E-03						
Caribou							1.03E-03	1.03E-03	1.03E-03							
Ducks											3.38E-04	3.67E-03	5.58E-04	4.40E-03	5.36E-04	5.60E-04
Total	5.27E-01	2.73E-02	7.06E-01	4.61E-01	5.55E+00	1.81E+00	2.34E-02	2.83E-01	2.24E+00	1.70E-01	2.14E-01	2.34E+00	3.53E-01	2.79E+00	3.39E-01	3.57E-01

Manganese		Hoary Marmot					Bear			Wolf	Mink					
Pathway	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	3.91E-03	1.18E-03	2.36E+00	7.46E-01	7.46E-01	7.46E-01	8.31E-04	1.66E+00	5.25E-01	1.05E-01	4.45E-03	8.75E-01	2.11E-03	2.77E+00	1.39E-03	1.22E-02
Sediment	7.58E+00										1.78E+00	3.50E+02	8.44E-01	1.11E+03	5.54E-01	4.88E+00
Soil		1.82E+00	2.52E+00	7.49E-01	6.69E-01	9.74E-01	1.39E+00	1.80E+00	1.02E+00	1.78E-01						
Fish							3.82E-02	7.63E+01	2.41E+01		1.26E+00	2.48E+02	5.97E-01	7.84E+02	3.92E-01	3.46E+00
Benthic	1.71E+01										8.90E-01	1.75E+02	4.22E-01	5.54E+02	2.77E-01	2.44E+00
Aquatic Veg	2.93E-01										8.41E-02	1.65E+01	3.98E-02	5.23E+01	2.62E-02	2.31E-01
Browse																
Forage		3.64E+01	3.38E+01	3.90E+01	2.58E+01	7.13E+01	6.41E+00	1.46E+01	8.09E+00							
Berries							1.07E+00	6.59E-01	7.68E-01							
Lichen										2.28E-04	4.68E-04	1.91E-04	4.68E-04	4.87E-04	4.68E-04	4.87E-04
Hare										1.45E-01						
Moose							5.26E-02	5.26E-02	5.26E-02							
Caribou							8.40E-04	8.40E-04	8.40E-04	2.32E-03						
Ducks											2.71E-03	5.32E-01	1.28E-03	1.69E+00	8.44E-04	7.43E-03
Total	2.49E+01	3.82E+01	3.87E+01	4.05E+01	2.72E+01	7.30E+01	8.97E+00	9.51E+01	3.46E+01	4.30E-01	4.02E+00	7.91E+02	1.91E+00	2.50E+03	1.25E+00	1.10E+01

Nickel		Hoary Marmot					Bear			Wolf	Mink					
Pathway	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	6.50E-05	8.44E-05	2.10E-02	7.56E-03	7.56E-03	7.56E-03	5.94E-05	1.47E-02	5.31E-03	9.85E-04	1.35E-04	8.86E-03	5.87E-04	2.46E-02	9.90E-05	2.03E-04
Sediment	1.19E-01										5.10E-02	3.35E+00	2.22E-01	9.29E+00	3.74E-02	7.66E-02
Soil		1.22E-02	4.38E-02	1.08E-02	2.44E-02	2.09E-02	9.30E-03	2.46E-02	1.86E-02	2.46E-03						
Fish							6.68E-04	1.66E-01	5.98E-02		9.36E-03	6.14E-01	4.07E-02	1.70E+00	6.86E-03	1.41E-02
Benthic	2.84E-02										2.70E-03	1.77E-01	1.17E-02	4.92E-01	1.98E-03	4.06E-03
Aquatic Veg	4.30E-04										2.25E-04	1.48E-02	9.79E-04	4.10E-02	1.65E-04	3.38E-04
Browse																
Forage		4.96E-02	1.44E-01	1.31E-01	9.50E-02	4.58E-01	8.74E-03	2.30E-02	1.63E-02							
Berries							4.24E-03	1.82E-02	5.57E-03							
Lichen										1.61E-05						
Hare										1.29E-02	1.87E-05	2.86E-05	1.87E-05	3.39E-05	1.87E-05	3.39E-05
Moose							4.68E-03	4.68E-03	4.68E-03							
Caribou							8.57E-05	8.57E-05	8.57E-05	2.36E-04						
Ducks											1.57E-03	1.03E-01	6.85E-03	2.87E-01	1.15E-03	2.37E-03
Total	1.48E-01	6.19E-02	2.08E-01	1.50E-01	1.27E-01	4.86E-01	2.78E-02	2.51E-01	1.10E-01	1.66E-02	6.50E-02	4.27E+00	2.83E-01	1.18E+01	4.77E-02	9.77E-02

by Pathway

Lead	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.94E-04	2.10E-03	3.20E-04	2.52E-03	3.07E-04	3.21E-04	3.63E-04	2.98E-03	2.48E-03
Sediment	3.36E-02	3.65E-01	5.55E-02	4.37E-01	5.33E-02	5.56E-02	6.66E-03	8.45E-02	8.08E-01
Soil									
Fish									
Benthic									
Aquatic Veg	8.40E-03	9.11E-02	1.39E-02	1.09E-01	1.33E-02	1.39E-02			
Browse	2.19E-03	1.42E-01	2.19E-03	1.73E-02	2.19E-03	1.73E-02			
Forage									
Berries							1.81E-04	9.50E-04	5.38E-03
Lichen									
Hare							3.72E-04	7.34E-03	6.06E-02
Moose									
Caribou									
Ducks							1.42E-03	1.16E-02	9.69E-03
Total	4.44E-02	6.00E-01	7.18E-02	5.66E-01	6.91E-02	8.72E-02	8.99E-03	1.07E-01	8.86E-01

Manganese	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	3.24E-03	6.37E-01	1.54E-03	2.02E+00	1.01E-03	8.89E-03	1.19E-03	2.38E+00	7.52E-01
Sediment	3.37E-01	6.63E+01	1.60E-01	2.10E+02	1.05E-01	9.25E-01	5.78E-01	7.46E-01	4.24E-01
Soil									
Fish									
Benthic									
Aquatic Veg	1.59E-01	3.13E+01	7.55E-02	9.91E+01	4.96E-02	4.37E-01			
Browse	6.29E+00	2.45E+01	6.29E+00	5.80E+00	6.29E+00	5.80E+00			
Forage									
Berries							2.80E-01	1.72E-01	2.00E-01
Lichen									
Hare							1.26E-03	1.32E-03	5.15E-04
Moose									
Caribou									
Ducks							2.23E-03	4.45E+00	1.41E+00
Total	6.79E+00	1.23E+02	6.53E+00	3.17E+02	6.45E+00	7.17E+00	8.63E-01	7.75E+00	2.78E+00

Nickel	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	9.82E-05	6.45E-03	4.28E-04	1.79E-02	7.21E-05	1.48E-04	8.51E-05	2.11E-02	7.62E-03
Sediment	9.65E-03	6.34E-01	4.20E-02	1.76E+00	7.08E-03	1.45E-02	3.86E-03	1.02E-02	7.71E-03
Soil									
Fish									
Benthic									
Aquatic Veg	4.26E-04	2.80E-02	1.85E-03	7.76E-02	3.13E-04	6.40E-04			
Browse	2.42E-02	2.99E-02	2.42E-02	3.30E-02	2.42E-02	3.30E-02			
Forage									
Berries							1.10E-03	4.75E-03	1.45E-03
Lichen									
Hare							5.07E-05	9.17E-05	7.72E-05
Moose									
Caribou									
Ducks							3.05E-03	7.57E-01	2.73E-01
Total	3.44E-02	6.98E-01	6.85E-02	1.89E+00	3.17E-02	4.83E-02	8.14E-03	7.93E-01	2.90E-01

by Pathway

Silver	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	3.58E-05	9.29E-06	6.74E-05	2.79E-04	2.79E-04	2.79E-04	4.13E-05	4.87E-05	7.54E-06	5.47E-05	2.27E-04	2.27E-04	2.27E-04
Sediment							1.60E-04						
Soil	1.46E-03	4.60E-03	4.07E-03	4.07E-03	9.63E-03	4.07E-03		1.61E-03	4.28E-03	3.79E-03	3.79E-03	8.96E-03	3.79E-03
Fish													
Benthic													
Aquatic Veg							2.73E-03						
Browse	3.34E-05	6.10E-04	5.43E-03	5.00E-04	4.14E-03	2.23E-03	6.05E-04		9.87E-04	8.79E-03	8.09E-04	6.70E-03	3.61E-03
Forage	4.05E-06	4.05E-04	1.38E-03	1.20E-03	1.31E-03	5.00E-03		5.05E-04					
Berries									1.64E-04	2.62E-04	4.92E-04	5.14E-05	4.06E-04
Lichen	3.57E-03												
Hare													
Moose													
Caribou													
Ducks													
Total	5.11E-03	5.62E-03	1.10E-02	6.05E-03	1.54E-02	1.16E-02	3.54E-03	2.17E-03	5.44E-03	1.29E-02	5.32E-03	1.59E-02	8.04E-03

Thallium	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment							n/a						
Soil	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fish													
Benthic													
Aquatic Veg							n/a						
Browse	7.82E-06	5.68E-04	7.52E-04	7.52E-04	7.52E-04	7.52E-04	1.42E-04		9.19E-04	1.22E-03	1.22E-03	1.22E-03	1.22E-03
Forage	4.11E-06	3.08E-04	3.72E-04	3.62E-04	3.61E-03	2.44E-04		1.84E-03					
Berries									7.35E-05	6.46E-05	5.57E-05	8.44E-05	7.76E-05
Lichen	1.59E-03												
Hare													
Moose													
Caribou													
Ducks													
Total	1.60E-03	8.77E-04	1.12E-03	1.11E-03	4.37E-03	9.96E-04	1.42E-04	1.84E-03	9.92E-04	1.28E-03	1.27E-03	1.30E-03	1.29E-03

Tin	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment							n/a						
Soil	3.70E-03	1.02E-02	3.18E-02	1.66E-02	1.28E-02	1.57E-02		1.13E-02	9.47E-03	2.96E-02	1.54E-02	1.19E-02	1.46E-02
Fish													
Benthic													
Aquatic Veg							n/a						
Browse	9.98E-05	1.20E-02	2.01E-02	1.05E-02	8.09E-03	3.76E-03	1.81E-03		1.93E-02	3.25E-02	1.69E-02	1.31E-02	6.08E-03
Forage	2.02E-05	8.95E-03	1.86E-03	6.42E-03	1.89E-03	6.61E-03		7.29E-03					
Berries									6.08E-04	3.23E-04	3.09E-02	2.91E-03	3.88E-04
Lichen	1.85E-02												
Hare													
Moose													
Caribou													
Ducks													
Total	2.23E-02	3.11E-02	5.37E-02	3.34E-02	2.28E-02	2.61E-02	1.81E-03	1.86E-02	2.94E-02	6.24E-02	6.32E-02	2.79E-02	2.11E-02

by Pathway

Silver	Mallard						Merganser						Scaup				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S
Water	2.87E-06	8.64E-05	2.26E-05	2.08E-05	2.87E-06	8.68E-07	2.59E-06	7.78E-05	2.04E-05	1.88E-05	2.59E-06	7.82E-07	3.17E-06	9.54E-05	2.50E-05	2.30E-05	3.17E-06
Sediment	6.93E-05	2.08E-03	5.46E-04	5.02E-04	6.93E-05	2.09E-05	4.49E-05	1.35E-03	3.54E-04	3.26E-04	4.49E-05	1.36E-05	3.00E-04	9.04E-03	2.37E-03	2.18E-03	3.00E-04
Soil																	
Fish							4.34E-03	1.30E-01	3.42E-02	3.15E-02	4.34E-03	1.31E-03					
Benthic	1.71E-03	5.15E-02	1.35E-02	1.24E-02	1.71E-03	5.18E-04							2.77E-03	8.33E-02	2.18E-02	2.01E-02	2.77E-03
Aquatic Veg	2.89E-03	8.71E-02	2.28E-02	2.10E-02	2.89E-03	8.75E-04							1.40E-03	4.21E-02	1.10E-02	1.02E-02	1.40E-03
Browse																	
Forage																	
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	4.68E-03	1.41E-01	3.69E-02	3.39E-02	4.68E-03	1.42E-03	4.38E-03	1.32E-01	3.46E-02	3.18E-02	4.38E-03	1.33E-03	4.47E-03	1.35E-01	3.53E-02	3.24E-02	4.47E-03

Thallium	Mallard						Merganser						Scaup				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Soil																	
Fish							n/a	n/a	n/a	n/a	n/a	n/a					
Benthic	n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a	n/a	n/a
Aquatic Veg	n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a	n/a	n/a
Browse																	
Forage																	
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Tin	Mallard						Merganser						Scaup				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Soil																	
Fish							n/a	n/a	n/a	n/a	n/a	n/a					
Benthic	n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a	n/a	n/a
Aquatic Veg	n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a	n/a	n/a
Browse																	
Forage																	
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

by Pathway

Silver		Hoary Marmot					Bear			Wolf	Mink					
Pathway	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	9.59E-07	8.44E-06	6.13E-05	2.54E-04	2.54E-04	2.54E-04	5.94E-06	4.31E-05	1.79E-04	1.35E-05	9.90E-06	2.98E-04	7.81E-05	7.18E-05	9.90E-06	2.99E-06
Sediment	9.09E-05										1.94E-04	5.83E-03	1.53E-03	1.40E-03	1.94E-04	5.86E-05
Soil		2.06E-03	1.82E-03	1.82E-03	4.31E-03	1.82E-03	1.57E-03	1.39E-03	2.59E-03	3.44E-04						
Fish							4.82E-04	3.49E-03	1.45E-02		4.95E-03	1.49E-01	3.90E-02	3.59E-02	4.95E-03	1.50E-03
Benthic	8.37E-04										3.96E-04	1.19E-02	3.12E-03	2.87E-03	3.96E-04	1.20E-04
Aquatic Veg	4.23E-04										1.10E-03	3.31E-02	8.68E-03	7.98E-03	1.10E-03	3.33E-04
Browse																
Forage		8.63E-04	2.95E-03	2.56E-03	2.79E-03	1.07E-02	1.52E-04	4.65E-04	3.64E-04							
Berries							1.62E-04	1.37E-04	4.60E-05							
Lichen										2.53E-07						
Hare										8.15E-05	2.60E-07	7.09E-07	2.60E-07	5.06E-07	2.60E-07	5.06E-07
Moose							2.96E-05	2.96E-05	2.96E-05							
Caribou							7.46E-06	7.46E-06	7.46E-06	2.06E-05						
Ducks											1.11E-04	3.35E-03	8.77E-04	8.07E-04	1.11E-04	3.36E-05
Total	1.35E-03	2.93E-03	4.83E-03	4.64E-03	7.35E-03	1.28E-02	2.41E-03	5.57E-03	1.77E-02	4.59E-04	6.76E-03	2.03E-01	5.33E-02	4.90E-02	6.76E-03	2.04E-03

Thallium		Hoary Marmot					Bear			Wolf	Mink					
Pathway	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a										n/a	n/a	n/a	n/a	n/a	n/a
Soil		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a						
Fish							n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a
Benthic	n/a										n/a	n/a	n/a	n/a	n/a	n/a
Aquatic Veg	n/a										n/a	n/a	n/a	n/a	n/a	n/a
Browse																
Forage		6.58E-04	7.94E-04	7.72E-04	7.71E-03	5.20E-04	1.16E-04	2.13E-04	1.10E-03							
Berries							7.27E-05	1.27E-04	7.55E-05							
Lichen										4.33E-07	4.05E-07	2.02E-06	4.05E-07	5.19E-07	4.05E-07	5.19E-07
Hare										3.26E-05						
Moose							1.18E-05	1.18E-05	1.18E-05							
Caribou							2.34E-05	2.34E-05	2.34E-05	6.44E-05						
Ducks											n/a	n/a	n/a	n/a	n/a	n/a
Total	0.00E+00	6.58E-04	7.94E-04	7.72E-04	7.71E-03	5.20E-04	2.24E-04	3.75E-04	1.21E-03	9.75E-05	4.05E-07	2.02E-06	4.05E-07	5.19E-07	4.05E-07	5.19E-07

Tin		Hoary Marmot					Bear			Wolf	Mink					
Pathway	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a										n/a	n/a	n/a	n/a	n/a	n/a
Soil		4.56E-03	1.42E-02	7.41E-03	5.73E-03	7.04E-03	3.48E-03	7.00E-03	4.99E-03	8.70E-04						
Fish							n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a
Benthic	n/a										n/a	n/a	n/a	n/a	n/a	n/a
Aquatic Veg	n/a										n/a	n/a	n/a	n/a	n/a	n/a
Browse																
Forage		1.91E-02	3.97E-03	1.37E-02	4.03E-03	1.41E-02	3.37E-03	1.06E-03	8.08E-04							
Berries							6.01E-04	6.36E-04	1.53E-03							
Lichen										8.53E-06	1.44E-05	1.05E-05	1.44E-05	2.48E-05	1.44E-05	2.48E-05
Hare							1.51E-04	1.51E-04	1.51E-04	4.16E-04						
Moose							3.26E-04	3.26E-04	3.26E-04	8.99E-04						
Caribou											n/a	n/a	n/a	n/a	n/a	n/a
Ducks																
Total	0.00E+00	2.37E-02	1.82E-02	2.11E-02	9.76E-03	2.12E-02	7.93E-03	9.17E-03	7.81E-03	2.19E-03	1.44E-05	1.05E-05	1.44E-05	2.48E-05	1.44E-05	2.48E-05

by Pathway

Silver	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	7.21E-06	2.17E-04	5.69E-05	5.23E-05	7.21E-06	2.18E-06	8.51E-06	6.17E-05	2.56E-04
Sediment	3.67E-05	1.10E-03	2.89E-04	2.66E-04	3.67E-05	1.11E-05			
Soil							6.53E-04	5.78E-04	1.07E-03
Fish									
Benthic									
Aquatic Veg	2.08E-03	6.27E-02	1.64E-02	1.51E-02	2.08E-03	6.30E-04			
Browse	9.69E-05	4.97E-04	9.69E-05	6.84E-04	9.69E-05	6.84E-04			
Forage									
Berries							4.22E-05	3.56E-05	1.20E-05
Lichen									
Hare							7.02E-07	1.37E-06	1.92E-06
Moose									
Caribou									
Ducks							2.93E-04	2.13E-03	8.83E-03
Total	2.22E-03	6.45E-02	1.69E-02	1.61E-02	2.22E-03	1.33E-03	9.98E-04	2.81E-03	1.02E-02

Thallium	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a			
Soil							n/a	n/a	n/a
Fish									
Benthic									
Aquatic Veg	n/a	n/a	n/a	n/a	n/a	n/a			
Browse	9.02E-05	9.29E-05	9.02E-05	1.19E-04	9.02E-05	1.19E-04			
Forage									
Berries							1.89E-05	3.32E-05	1.97E-05
Lichen									
Hare							1.09E-06	1.40E-06	5.45E-06
Moose									
Caribou									
Ducks							n/a	n/a	n/a
Total	9.02E-05	9.29E-05	9.02E-05	1.19E-04	9.02E-05	1.19E-04	2.00E-05	3.46E-05	2.51E-05

Tin	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a			
Soil							1.44E-03	2.90E-03	2.07E-03
Fish									
Benthic									
Aquatic Veg	n/a	n/a	n/a	n/a	n/a	n/a			
Browse	1.90E-03	4.79E-03	1.90E-03	2.05E-03	1.90E-03	2.05E-03			
Forage									
Berries							1.57E-04	1.66E-04	3.98E-04
Lichen									
Hare							3.88E-05	6.71E-05	2.84E-05
Moose									
Caribou									
Ducks							n/a	n/a	n/a
Total	1.90E-03	4.79E-03	1.90E-03	2.05E-03	1.90E-03	2.05E-03	1.64E-03	3.13E-03	2.50E-03

by Pathway

Zinc	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	1.05E+00	7.77E-04	7.02E+00	5.91E+00	5.91E+00	5.91E+00	1.22E+00	2.43E+00	6.30E-04	5.70E+00	4.79E+00	4.79E+00	4.79E+00
Sediment							4.23E+01						
Soil	5.63E-01	6.50E-01	1.83E+00	1.00E+00	5.02E+00	2.99E+00		2.73E-01	6.05E-01	1.70E+00	9.35E-01	4.68E+00	2.78E+00
Fish													
Benthic													
Aquatic Veg							1.05E+02						
Browse	2.66E-01	1.25E+01	8.38E+00	9.45E+00	3.23E+01	2.57E+01	4.82E+00		2.03E+01	1.35E+01	1.53E+01	5.23E+01	4.16E+01
Forage	1.30E-02	1.44E+00	1.30E+01	2.00E+00	4.61E+00	2.48E+00		1.49E+00					
Berries									9.39E-02	1.48E-01	8.12E-02	2.44E-01	2.49E-01
Lichen	2.13E+00												
Hare													
Moose													
Caribou													
Ducks													
Total	4.03E+00	1.46E+01	3.02E+01	1.84E+01	4.79E+01	3.71E+01	1.53E+02	4.19E+00	2.10E+01	2.11E+01	2.11E+01	6.20E+01	4.94E+01

by Pathway

Zinc	Mallard						Merganser						Scaup				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S
Water	1.29E-03	1.83E+00	5.62E-04	2.17E+00	2.40E-04	1.72E-02	1.16E-03	1.64E+00	5.06E-04	1.95E+00	2.16E-04	1.55E-02	1.43E-03	2.02E+00	6.21E-04	2.40E+00	2.65E-04
Sediment	2.80E-01	3.95E+02	1.22E-01	4.70E+02	5.20E-02	3.73E+00	1.81E-01	2.56E+02	7.89E-02	3.05E+02	3.37E-02	2.41E+00	1.21E+00	1.72E+03	5.28E-01	2.04E+03	2.26E-01
Soil																	
Fish							6.06E+00	8.57E+03	2.64E+00	1.02E+04	1.13E+00	8.07E+01					
Benthic	1.04E+01	1.46E+04	4.50E+00	1.74E+04	1.93E+00	1.38E+02							1.67E+01	2.37E+04	7.28E+00	2.81E+04	3.11E+00
Aquatic Veg	1.69E+00	2.39E+03	7.36E-01	2.84E+03	3.15E-01	2.25E+01							8.19E-01	1.16E+03	3.56E-01	1.37E+03	1.52E-01
Browse																	
Forage																	
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	1.23E+01	1.74E+04	5.36E+00	2.07E+04	2.29E+00	1.64E+02	6.25E+00	8.83E+03	2.72E+00	1.05E+04	1.16E+00	8.32E+01	1.88E+01	2.65E+04	8.16E+00	3.15E+04	3.49E+00

by Pathway

Zinc		Hoary Marmot					Bear			Wolf	Mink					
Pathway	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.90E-02	7.06E-04	6.38E+00	5.37E+00	5.37E+00	5.37E+00	4.97E-04	4.49E+00	3.78E+00	3.96E-01	4.46E-03	6.30E+00	1.94E-03	7.48E+00	8.28E-04	5.93E-02
Sediment	1.62E+01										7.82E-01	1.11E+03	3.40E-01	1.31E+03	1.45E-01	1.04E+01
Soil		2.91E-01	8.19E-01	4.50E-01	2.25E+00	1.34E+00	2.23E-01	4.56E-01	1.31E+00	1.32E-01						
Fish							1.25E-01	1.13E+03	9.52E+02		6.92E+00	9.78E+03	3.01E+00	1.16E+04	1.29E+00	9.21E+01
Benthic	2.23E+02										2.39E+00	3.38E+03	1.04E+00	4.02E+03	4.45E-01	3.19E+01
Aquatic Veg	1.09E+01										6.44E-01	9.09E+02	2.80E-01	1.08E+03	1.20E-01	8.57E+00
Browse																
Forage		3.07E+00	2.77E+01	4.27E+00	9.84E+00	5.29E+00	5.42E-01	4.26E+00	1.38E+00							
Berries							9.28E-02	1.66E-01	2.03E-01							
Lichen										2.52E-02	2.25E-02	7.37E-02	2.25E-02	4.65E-02	2.25E-02	4.65E-02
Hare										1.17E+02						
Moose							4.26E+01	4.26E+01	4.26E+01	5.41E-01						
Caribou							1.96E-01	1.96E-01	1.96E-01							
Ducks											9.73E-01	1.37E+03	4.23E-01	1.63E+03	1.81E-01	1.29E+01
Total	2.50E+02	3.36E+00	3.49E+01	1.01E+01	1.75E+01	1.20E+01	4.38E+01	1.18E+03	1.00E+03	1.18E+02	1.17E+01	1.66E+04	5.12E+00	1.97E+04	2.20E+00	1.56E+02

by Pathway

Zinc	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	3.24E-03	4.58E+00	1.41E-03	5.45E+00	6.03E-04	4.32E-02	7.12E-04	6.43E+00	5.41E+00
Sediment	1.48E-01	2.09E+02	6.44E-02	2.49E+02	2.75E-02	1.97E+00			
Soil							9.23E-02	1.89E-01	5.44E-01
Fish									
Benthic									
Aquatic Veg	1.22E+00	1.72E+03	5.30E-01	2.05E+03	2.27E-01	1.62E+01			
Browse	1.99E+00	3.84E+00	1.99E+00	2.83E+00	1.99E+00	2.83E+00			
Forage									
Berries							2.42E-02	4.32E-02	5.29E-02
Lichen									
Hare							6.08E-02	1.26E-01	1.99E-01
Moose									
Caribou									
Ducks							4.77E-01	4.31E+03	3.63E+03
Total	3.36E+00	1.94E+03	2.59E+00	2.30E+03	2.24E+00	2.11E+01	6.55E-01	4.32E+03	3.63E+03

Pct by Pathway

Percent Intake by Pathway

Arsenic	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	6.22%	0.16%	0.96%	39.09%	12.11%	18.96%	2.17%	4.50%	0.09%	0.77%	28.96%	8.74%	15.32%
Sediment							86.97%						
Soil	24.73%	22.34%	57.52%	24.10%	34.66%	54.55%		7.19%	15.44%	53.13%	20.47%	28.69%	50.55%
Fish													
Benthic							0.72%						
Aquatic Veg							10.14%						
Browse	1.85%	67.51%	25.29%	34.02%	42.64%	21.04%			81.08%	40.59%	50.22%	61.32%	33.88%
Forage	0.12%	9.99%	16.24%	2.79%	10.58%	5.45%		88.31%					
Berries									3.38%	5.51%	0.35%	1.25%	0.26%
Lichen	67.08%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	10.99%	0.02%	3.82%	10.75%	3.13%	2.54%	0.08%	40.75%	0.01%	2.02%	8.02%	1.66%	1.34%
Sediment							1.26%						
Soil	19.88%	3.54%	2.39%	23.20%	4.16%	2.45%		13.42%	2.15%	1.45%	19.85%	2.54%	1.48%
Fish													
Benthic							95.90%						
Aquatic Veg							2.76%						
Browse	25.30%	92.59%	91.06%	47.86%	90.02%	91.93%			97.69%	95.92%	71.15%	95.47%	96.45%
Forage	0.21%	3.85%	2.73%	18.19%	2.69%	3.09%		45.84%					
Berries									0.16%	0.61%	0.98%	0.33%	0.73%
Lichen	43.62%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	19.52%	0.11%	23.54%	29.81%	19.73%	24.36%	0.43%	21.61%	0.08%	17.23%	23.44%	15.62%	18.80%
Sediment							94.62%						
Soil	28.02%	13.70%	19.39%	18.10%	37.67%	26.81%		3.49%	12.08%	16.27%	16.33%	34.20%	23.73%
Fish													
Benthic							4.12%						
Aquatic Veg							0.83%						
Browse	2.41%	53.44%	40.61%	31.75%	29.42%	33.14%			81.92%	59.21%	49.75%	46.42%	50.96%
Forage	0.36%	32.76%	16.47%	20.34%	13.18%	15.69%		74.90%					
Berries									5.91%	7.30%	10.48%	3.75%	6.51%
Lichen	49.69%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Percent Intake by Pat

Arsenic	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Sediment	4.68%	4.68%	4.68%	4.68%	4.68%	4.68%	37.32%	37.32%	37.32%	37.32%	37.32%	37.32%	11.66%	11.66%	11.66%	11.66%	11.66%	11.66%
Soil																		
Fish							62.47%	62.47%	62.47%	62.47%	62.47%	62.47%						
Benthic	95.20%	95.20%	95.20%	95.20%	95.20%	95.20%							88.30%	88.30%	88.30%	88.30%	88.30%	88.30%
Aquatic Veg	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%							0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sediment	0.33%	0.33%	0.33%	0.33%	0.33%	0.33%	6.62%	6.62%	6.62%	6.62%	6.62%	6.62%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%
Soil																		
Fish							93.29%	93.29%	93.29%	93.29%	93.29%	93.29%						
Benthic	38.26%	38.26%	38.26%	38.26%	38.26%	38.26%							66.51%	66.51%	66.51%	66.51%	66.51%	66.51%
Aquatic Veg	61.40%	61.40%	61.40%	61.40%	61.40%	61.40%							31.95%	31.95%	31.95%	31.95%	31.95%	31.95%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Sediment	30.45%	30.45%	30.45%	30.45%	30.45%	30.45%	22.98%	22.98%	22.98%	22.98%	22.98%	22.98%	54.87%	54.87%	54.87%	54.87%	54.87%	54.87%
Soil																		
Fish							77.00%	77.00%	77.00%	77.00%	77.00%	77.00%						
Benthic	66.28%	66.28%	66.28%	66.28%	66.28%	66.28%							44.47%	44.47%	44.47%	44.47%	44.47%	44.47%
Aquatic Veg	3.25%	3.25%	3.25%	3.25%	3.25%	3.25%							0.65%	0.65%	0.65%	0.65%	0.65%	0.65%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Percent Intake by Pat

Arsenic	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.45%	1.42%	67.99%	22.43%	32.35%	0.51%	2.00%	5.79%	17.29%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%
Sediment										31.20%	31.20%	31.20%	31.20%	31.20%	31.20%
Soil	31.79%	42.01%	20.63%	31.59%	45.81%	38.77%	40.50%	6.47%	43.06%						
Fish						7.38%	29.09%	84.22%		13.82%	13.82%	13.82%	13.82%	13.82%	13.82%
Benthic										52.45%	52.45%	52.45%	52.45%	52.45%	52.45%
Aquatic Veg										0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
Browse															
Forage	67.76%	56.56%	11.38%	45.98%	21.84%	19.04%	18.78%	2.46%							
Berries						22.81%	7.08%	0.82%							
Lichen															
Hare									0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Moose						10.91%	2.43%	0.23%	37.62%						
Caribou						0.58%	0.13%	0.01%	1.99%						
Ducks										2.30%	2.30%	2.30%	2.30%	2.30%	2.30%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.15%	33.50%	16.58%	27.20%	23.10%	0.13%	1.83%	1.82%	1.46%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
Sediment										2.46%	2.23%	2.45%	2.29%	2.40%	2.26%
Soil	16.11%	10.33%	17.60%	17.83%	10.95%	15.56%	0.84%	1.05%	1.65%						
Fish						6.77%	92.24%	91.61%		9.17%	8.30%	9.12%	8.52%	8.95%	8.44%
Benthic										23.62%	21.39%	23.49%	21.95%	23.05%	21.73%
Aquatic Veg										62.33%	56.44%	62.00%	57.93%	60.82%	57.36%
Browse															
Forage	83.74%	56.18%	65.82%	54.98%	65.95%	18.63%	0.68%	0.80%							
Berries						3.09%	0.24%	0.38%							
Lichen															
Hare									0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Moose						55.64%	4.16%	4.32%	96.56%						
Caribou						0.19%	0.01%	0.01%	0.32%						
Ducks										2.39%	11.62%	2.91%	9.28%	4.75%	10.18%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.13%	32.81%	34.49%	28.51%	32.75%	0.08%	0.61%	0.61%	1.75%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
Sediment										47.81%	47.82%	47.81%	47.82%	47.81%	47.82%
Soil	8.05%	13.30%	10.31%	26.79%	17.74%	5.24%	0.20%	0.46%	1.58%						
Fish						12.31%	97.33%	97.49%		42.39%	42.39%	42.39%	42.39%	42.39%	42.39%
Benthic										8.61%	8.61%	8.61%	8.61%	8.61%	8.61%
Aquatic Veg										0.69%	0.69%	0.69%	0.69%	0.69%	0.69%
Browse															
Forage	91.82%	53.89%	55.21%	44.70%	49.51%	13.77%	0.26%	0.21%							
Berries						6.89%	0.30%	0.17%							
Lichen															
Hare									0.01%	0.02%	0.00%	0.01%	0.00%	0.01%	0.00%
Moose						61.51%	1.30%	1.06%	96.34%						
Caribou						0.21%	0.00%	0.00%	0.32%						
Ducks										0.44%	0.44%	0.44%	0.44%	0.44%	0.44%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Percent Intake by Pat

Arsenic	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.98%	1.80%	1.56%	1.65%	0.70%	1.33%	1.30%	1.88%	2.13%
Sediment	51.45%	94.66%	81.86%	87.02%	36.73%	69.88%			
Soil							28.68%	11.00%	0.69%
Fish									
Benthic									
Aquatic Veg	1.41%	2.60%	2.25%	2.39%	1.01%	1.92%			
Browse	46.16%	0.94%	14.34%	8.93%	61.56%	26.87%			
Forage									
Berries							10.61%	1.21%	0.05%
Lichen									
Hare							0.08%	0.02%	0.00%
Moose									
Caribou									
Ducks							59.34%	85.89%	97.13%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.01%	0.02%	0.01%	0.02%	0.01%	0.02%	0.18%	0.10%	0.07%
Sediment	0.29%	0.39%	0.31%	0.39%	0.32%	0.34%			
Soil							6.15%	0.01%	0.01%
Fish									
Benthic									
Aquatic Veg	73.17%	99.49%	78.91%	99.35%	82.29%	85.23%			
Browse	26.53%	0.10%	20.76%	0.24%	17.37%	14.41%			
Forage									
Berries							0.77%	0.00%	0.00%
Lichen									
Hare							0.04%	0.00%	0.00%
Moose									
Caribou									
Ducks							92.86%	99.89%	99.91%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.15%	0.30%	0.18%	0.30%	0.23%	0.28%	1.45%	3.04%	3.03%
Sediment	42.07%	87.00%	53.27%	86.96%	66.68%	80.24%			
Soil							28.50%	0.29%	0.66%
Fish									
Benthic									
Aquatic Veg	6.10%	12.61%	7.72%	12.61%	9.67%	11.64%			
Browse	51.68%	0.08%	38.82%	0.13%	23.42%	7.84%			
Forage									
Berries							23.55%	0.27%	0.16%
Lichen									
Hare							0.61%	0.01%	0.01%
Moose									
Caribou									
Ducks							45.90%	96.40%	96.15%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.03%	0.62%	0.26%	0.16%	0.03%	0.07%	0.28%	2.99%	0.48%	0.23%	0.11%	0.02%	0.06%
Sediment							37.38%						
Soil	32.73%	73.41%	79.90%	56.01%	78.84%	96.64%		68.69%	65.13%	80.60%	42.82%	77.95%	96.98%
Fish													
Benthic							2.80%						
Aquatic Veg							59.53%						
Browse	0.38%	21.63%	10.47%	42.66%	12.68%	1.64%			33.35%	18.34%	56.68%	21.78%	2.85%
Forage	0.05%	4.34%	9.37%	1.16%	8.46%	1.65%		28.32%					
Berries									1.05%	0.83%	0.39%	0.25%	0.11%
Lichen	66.81%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	8.09%	0.00%	4.11%	2.53%	3.31%	0.94%	0.85%	4.57%	0.00%	2.97%	2.73%	3.38%	0.77%
Sediment							67.65%						
Soil	21.99%	6.71%	8.91%	5.17%	6.03%	2.49%		5.46%	5.50%	7.39%	6.39%	7.06%	2.34%
Fish													
Benthic							9.58%						
Aquatic Veg							21.92%						
Browse	13.25%	65.23%	61.91%	35.91%	41.90%	58.35%			92.93%	89.18%	77.08%	85.22%	95.10%
Forage	1.82%	28.06%	25.07%	56.38%	48.76%	38.21%		89.97%					
Berries									1.58%	0.46%	13.80%	4.34%	1.79%
Lichen	54.84%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	8.96%	0.05%	6.28%	6.70%	2.69%	1.45%	1.08%	7.79%	0.03%	4.58%	8.03%	1.73%	1.17%
Sediment							81.00%						
Soil	35.70%	13.39%	26.64%	19.53%	17.63%	8.11%		1.54%	9.16%	22.30%	26.84%	13.04%	7.51%
Fish													
Benthic							1.07%						
Aquatic Veg							16.85%						
Browse	8.89%	75.11%	48.77%	24.18%	65.28%	53.13%			89.26%	70.94%	57.75%	83.92%	85.44%
Forage	0.77%	11.46%	18.31%	49.60%	14.40%	37.31%		90.67%					
Berries									1.55%	2.18%	7.38%	1.31%	5.88%
Lichen	45.68%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
Sediment	64.61%	64.61%	64.61%	64.61%	64.61%	64.61%	64.16%	64.16%	64.16%	64.16%	64.16%	64.16%	86.51%	86.51%	86.51%	86.51%	86.51%	86.51%
Soil																		
Fish							35.73%	35.73%	35.73%	35.73%	35.73%	35.73%						
Benthic	23.44%	23.44%	23.44%	23.44%	23.44%	23.44%							11.69%	11.69%	11.69%	11.69%	11.69%	11.69%
Aquatic Veg	11.88%	11.88%	11.88%	11.88%	11.88%	11.88%							1.77%	1.77%	1.77%	1.77%	1.77%	1.77%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
Sediment	13.52%	13.52%	13.52%	13.52%	13.52%	13.52%	27.19%	27.19%	27.19%	27.19%	27.19%	27.19%	30.39%	30.39%	30.39%	30.39%	30.39%	30.39%
Soil																		
Fish							72.73%	72.73%	72.73%	72.73%	72.73%	72.73%						
Benthic	81.75%	81.75%	81.75%	81.75%	81.75%	81.75%							68.42%	68.42%	68.42%	68.42%	68.42%	68.42%
Aquatic Veg	4.70%	4.70%	4.70%	4.70%	4.70%	4.70%							1.18%	1.18%	1.18%	1.18%	1.18%	1.18%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.13%	0.13%	0.13%	0.13%	0.13%	0.13%	0.18%	0.18%	0.18%	0.18%	0.18%	0.18%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
Sediment	59.71%	59.71%	59.71%	59.71%	59.71%	59.71%	58.94%	58.94%	58.94%	58.94%	58.94%	58.94%	80.48%	80.48%	80.48%	80.48%	80.48%	80.48%
Soil																		
Fish							40.89%	40.89%	40.89%	40.89%	40.89%	40.89%						
Benthic	38.22%	38.22%	38.22%	38.22%	38.22%	38.22%							19.19%	19.19%	19.19%	19.19%	19.19%	19.19%
Aquatic Veg	1.94%	1.94%	1.94%	1.94%	1.94%	1.94%							0.29%	0.29%	0.29%	0.29%	0.29%	0.29%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.32%	0.42%	0.53%	0.04%	0.14%	1.08%	0.73%	0.08%	0.13%	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%
Sediment										82.88%	82.14%	82.90%	82.86%	82.90%	82.30%
Soil	76.97%	63.86%	90.50%	66.12%	92.33%	68.67%	71.94%	87.12%	95.35%	12.21%	12.10%	12.21%	12.21%	12.21%	12.13%
Fish						17.26%	11.69%	1.23%		2.49%	2.46%	2.49%	2.49%	2.49%	2.47%
Benthic										2.07%	2.05%	2.07%	2.07%	2.07%	2.06%
Aquatic Veg															
Browse															
Forage	21.71%	35.73%	8.97%	33.84%	7.54%	4.46%	13.88%	10.58%							
Berries						2.96%	1.29%	0.92%							
Lichen															
Hare									2.41%	0.06%	0.96%	0.04%	0.10%	0.04%	0.76%
Moose						1.17%	0.10%	0.01%	0.44%						
Caribou						4.40%	0.36%	0.05%	1.66%						
Ducks										0.16%	0.16%	0.16%	0.16%	0.16%	0.16%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.00%	6.10%	1.84%	2.74%	1.02%	0.01%	1.75%	1.52%	24.33%	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%
Sediment										44.26%	44.27%	44.26%	44.27%	44.25%	44.26%
Soil	4.77%	6.51%	1.85%	2.46%	1.33%	15.54%	1.89%	2.96%	41.41%	31.33%	31.33%	31.32%	31.33%	31.32%	31.33%
Fish						0.43%	80.24%	69.75%		22.13%	22.13%	22.13%	22.13%	22.13%	22.13%
Benthic										2.09%	2.09%	2.09%	2.09%	2.09%	2.09%
Aquatic Veg															
Browse															
Forage	95.23%	87.39%	96.30%	94.80%	97.64%	71.47%	15.37%	23.40%							
Berries						11.96%	0.69%	2.22%							
Lichen															
Hare									0.05%	0.01%	0.00%	0.02%	0.00%	0.04%	0.00%
Moose						0.59%	0.06%	0.15%	33.66%						
Caribou						0.01%	0.00%	0.00%	0.54%						
Ducks										0.07%	0.07%	0.07%	0.07%	0.07%	0.07%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.14%	10.07%	5.05%	5.95%	1.56%	0.21%	5.87%	4.82%	5.94%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%
Sediment										78.45%	78.47%	78.46%	78.47%	78.44%	78.44%
Soil	19.66%	21.02%	7.24%	19.21%	4.29%	33.49%	9.78%	16.84%	14.82%	14.40%	14.40%	14.40%	14.40%	14.40%	14.40%
Fish						2.41%	66.04%	54.19%		4.15%	4.15%	4.15%	4.15%	4.15%	4.15%
Benthic										0.35%	0.35%	0.35%	0.35%	0.35%	0.35%
Aquatic Veg															
Browse															
Forage	80.20%	68.91%	87.71%	74.84%	94.15%	31.48%	9.16%	14.78%							
Berries						15.25%	7.25%	5.05%							
Lichen															
Hare									0.10%	0.03%	0.00%	0.01%	0.00%	0.04%	0.03%
Moose						16.85%	1.86%	4.24%	77.73%						
Caribou						0.31%	0.03%	0.08%	1.42%						
Ducks										2.42%	2.42%	2.42%	2.42%	2.42%	2.42%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.44%	0.35%	0.45%	0.45%	0.44%	0.37%	4.04%	2.77%	0.28%
Sediment	75.70%	60.79%	77.20%	77.19%	77.10%	63.79%			
Soil							74.06%	78.68%	91.18%
Fish									
Benthic									
Aquatic Veg	18.92%	15.20%	19.30%	19.30%	19.28%	15.95%			
Browse	4.94%	23.66%	3.06%	3.06%	3.18%	19.89%			
Forage									
Berries							2.01%	0.89%	0.61%
Lichen									
Hare							4.14%	6.84%	6.84%
Moose									
Caribou									
Ducks							15.75%	10.82%	1.09%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.05%	0.52%	0.02%	0.64%	0.02%	0.12%	0.14%	30.73%	27.04%
Sediment	4.96%	54.00%	2.45%	66.25%	1.63%	12.90%			
Soil							67.02%	9.63%	15.23%
Fish									
Benthic									
Aquatic Veg	2.34%	25.50%	1.16%	31.28%	0.77%	6.09%			
Browse	92.64%	19.99%	96.37%	1.83%	97.59%	80.89%			
Forage									
Berries							32.44%	2.22%	7.20%
Lichen									
Hare							0.15%	0.02%	0.02%
Moose									
Caribou									
Ducks							0.26%	57.40%	50.51%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.29%	0.92%	0.62%	0.95%	0.23%	0.31%	1.05%	2.67%	2.63%
Sediment	28.08%	90.79%	61.35%	93.19%	22.37%	30.04%			
Soil							47.35%	1.29%	2.66%
Fish									
Benthic									
Aquatic Veg	1.24%	4.01%	2.71%	4.11%	0.99%	1.33%			
Browse	70.39%	4.28%	35.32%	1.75%	76.42%	68.33%			
Forage									
Berries							13.56%	0.60%	0.50%
Lichen									
Hare							0.62%	0.01%	0.03%
Moose									
Caribou									
Ducks							37.42%	95.44%	94.18%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Silver	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.70%	0.17%	0.61%	4.62%	1.82%	2.41%	1.17%	2.24%	0.14%	0.42%	4.27%	1.42%	2.82%
Sediment							4.53%						
Soil	28.64%	81.79%	37.17%	67.27%	62.70%	35.14%		74.44%	78.70%	29.39%	71.27%	56.23%	47.16%
Fish													
Benthic							77.21%						
Aquatic Veg							17.09%						
Browse	0.65%	10.85%	49.60%	8.26%	26.97%	19.28%			18.15%	68.15%	15.21%	42.03%	44.96%
Forage	0.08%	7.19%	12.62%	19.85%	8.51%	43.17%		23.31%					
Berries									3.01%	2.03%	9.25%	0.32%	5.06%
Lichen	69.92%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water													
Sediment													
Soil													
Fish													
Benthic													
Aquatic Veg													
Browse	0.49%	64.82%	66.90%	67.54%	17.23%	75.52%	100.00%		92.59%	94.96%	95.62%	93.51%	94.00%
Forage	0.26%	35.18%	33.10%	32.46%	82.77%	24.48%		100.00%					
Berries									7.41%	5.04%	4.38%	6.49%	6.00%
Lichen	99.25%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Tin	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water													
Sediment	16.58%	32.74%	59.17%	49.51%	56.21%	60.26%		60.77%	32.20%	47.43%	24.38%	42.70%	69.35%
Soil													
Fish													
Benthic													
Aquatic Veg													
Browse	0.45%	38.46%	37.37%	31.27%	35.50%	14.41%	100.00%		65.73%	52.05%	26.75%	46.86%	28.81%
Forage	0.09%	28.80%	3.46%	19.21%	8.30%	25.33%		39.23%					
Berries									2.07%	0.52%	48.87%	10.44%	1.84%
Lichen	82.88%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Silver	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%
Sediment	1.48%	1.48%	1.48%	1.48%	1.48%	1.48%	1.02%	1.02%	1.02%	1.02%	1.02%	1.02%	6.72%	6.72%	6.72%	6.72%	6.72%	6.72%
Soil																		
Fish							98.92%	98.92%	98.92%	98.92%	98.92%	98.92%						
Benthic	36.61%	36.61%	36.61%	36.61%	36.61%	36.61%							61.91%	61.91%	61.91%	61.91%	61.91%	61.91%
Aquatic Veg	61.85%	61.85%	61.85%	61.85%	61.85%	61.85%							31.30%	31.30%	31.30%	31.30%	31.30%	31.30%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water																		
Sediment																		
Soil																		
Fish																		
Benthic																		
Aquatic Veg																		
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Tin	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water																		
Sediment																		
Soil																		
Fish																		
Benthic																		
Aquatic Veg																		
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Pct by Pathway

Silver	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.29%	1.27%	5.48%	3.46%	1.99%	0.25%	0.77%	1.01%	2.93%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%
Sediment										2.86%	2.86%	2.86%	2.86%	2.86%	2.86%
Soil	70.25%	37.70%	39.27%	58.61%	14.29%	65.25%	25.02%	14.62%	74.80%						
Fish						19.96%	62.74%	81.85%		73.21%	73.21%	73.21%	73.21%	73.21%	73.19%
Benthic										5.86%	5.86%	5.86%	5.86%	5.86%	5.86%
Aquatic Veg										16.28%	16.28%	16.28%	16.28%	16.28%	16.27%
Browse															
Forage	29.46%	61.03%	55.25%	37.93%	83.72%	6.31%	8.34%	2.06%							
Berries						6.71%	2.45%	0.26%							
Lichen															
Hare									0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.02%
Moose						1.23%	0.53%	0.17%	17.74%						
Caribou						0.31%	0.13%	0.04%	4.48%						
Ducks										1.65%	1.65%	1.65%	1.65%	1.65%	1.64%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water															
Sediment															
Soil															
Fish															
Benthic															
Aquatic Veg															
Browse															
Forage	100.00%	100.00%	100.00%	100.00%	100.00%	51.82%	56.71%	90.84%							
Berries						32.46%	33.91%	6.25%							
Lichen															
Hare									0.44%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Moose						5.29%	3.15%	0.98%	33.46%						
Caribou						10.44%	6.23%	1.93%	66.09%						
Ducks															
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Tin	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water															
Sediment															
Soil	19.25%	78.18%	35.08%	58.69%	33.28%	43.94%	76.27%	63.96%	39.65%						
Fish															
Benthic															
Aquatic Veg															
Browse															
Forage	80.75%	21.82%	64.92%	41.31%	66.72%	42.47%	11.60%	10.35%							
Berries						7.57%	6.93%	19.57%							
Lichen															
Hare									0.39%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Moose						1.90%	1.65%	1.93%	18.97%						
Caribou						4.11%	3.56%	4.18%	40.99%						
Ducks															
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Silver	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.32%	0.34%	0.34%	0.32%	0.32%	0.16%	0.85%	2.20%	2.52%
Sediment	1.65%	1.71%	1.71%	1.65%	1.65%	0.84%			
Soil							65.43%	20.60%	10.55%
Fish									
Benthic									
Aquatic Veg	93.67%	97.18%	97.38%	93.78%	93.67%	47.48%			
Browse	4.36%	0.77%	0.57%	4.24%	4.36%	51.52%			
Forage									
Berries							4.23%	1.27%	0.12%
Lichen									
Hare							0.07%	0.05%	0.02%
Moose									
Caribou									
Ducks							29.42%	75.88%	86.80%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water									
Sediment									
Soil									
Fish									
Benthic									
Aquatic Veg									
Browse	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			
Forage									
Berries							94.54%	95.94%	78.31%
Lichen									
Hare							5.46%	4.06%	21.69%
Moose									
Caribou									
Ducks									
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Tin	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water									
Sediment									
Soil							88.09%	92.57%	82.91%
Fish									
Benthic									
Aquatic Veg									
Browse	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			
Forage									
Berries							9.54%	5.29%	15.95%
Lichen									
Hare							2.37%	2.14%	1.14%
Moose									
Caribou									
Ducks									
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Caribou	Hare					Moose	Sheep	Grouse				
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	26.19%	0.01%	23.22%	32.16%	12.34%	15.92%	0.80%	57.97%	0.00%	27.00%	22.72%	7.73%	9.70%
Sediment							27.69%						
Soil	13.99%	4.45%	6.06%	5.47%	10.50%	8.07%		6.51%	2.89%	8.08%	4.43%	7.55%	5.64%
Fish													
Benthic													
Aquatic Veg							68.36%						
Browse	6.62%	85.70%	27.72%	51.47%	67.53%	69.33%	3.15%		96.66%	64.22%	72.46%	84.33%	84.16%
Forage	0.32%	9.85%	43.00%	10.90%	9.63%	6.68%		35.52%					
Berries									0.45%	0.70%	0.39%	0.39%	0.50%
Lichen	52.87%												
Hare													
Moose													
Caribou													
Ducks													
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Mallard						Merganser						Scaup					
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Sediment	2.27%	2.27%	2.27%	2.27%	2.27%	2.27%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	6.47%	6.47%	6.47%	6.47%	6.47%	6.47%
Soil																		
Fish							97.08%	97.08%	97.08%	97.08%	97.08%	97.08%						
Benthic	83.99%	83.99%	83.99%	83.99%	83.99%	83.99%							89.16%	89.16%	89.16%	89.16%	89.16%	89.16%
Aquatic Veg	13.73%	13.73%	13.73%	13.73%	13.73%	13.73%							4.36%	4.36%	4.36%	4.36%	4.36%	4.36%
Browse																		
Forage																		
Berries																		
Lichen																		
Hare																		
Moose																		
Caribou																		
Ducks																		
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Hoary Marmot					Bear			Wolf	Mink					
Pathway	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.02%	18.27%	53.21%	30.76%	44.77%	0.00%	0.38%	0.38%	0.33%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
Sediment										6.66%	6.68%	6.65%	6.68%	6.61%	6.67%
Soil	8.65%	2.35%	4.46%	12.88%	11.16%	0.51%	0.04%	0.13%	0.11%	58.94%	59.05%	58.79%	59.05%	58.45%	59.03%
Fish						0.29%	95.59%	95.06%		20.40%	20.44%	20.35%	20.44%	20.23%	20.43%
Benthic										5.48%	5.49%	5.47%	5.49%	5.44%	5.49%
Aquatic Veg															
Browse															
Forage	91.33%	79.39%	42.33%	56.35%	44.06%	1.24%	0.36%	0.14%							
Berries						0.21%	0.01%	0.02%							
Lichen															
Hare									0.02%	0.19%	0.00%	0.44%	0.00%	1.02%	0.03%
Moose						97.31%	3.60%	4.25%	99.08%						
Caribou						0.45%	0.02%	0.02%	0.46%						
Ducks										8.29%	8.30%	8.27%	8.30%	8.22%	8.30%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Beaver						Fox		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.10%	0.24%	0.05%	0.24%	0.03%	0.20%	0.11%	0.15%	0.15%
Sediment	4.41%	10.79%	2.49%	10.80%	1.23%	9.36%	14.09%	0.00%	0.01%
Soil									
Fish									
Benthic									
Aquatic Veg	36.28%	88.78%	20.50%	88.84%	10.10%	77.00%			
Browse	59.21%	0.20%	76.95%	0.12%	88.65%	13.44%			
Forage									
Berries							3.69%	0.00%	0.00%
Lichen									
Hare							9.29%	0.00%	0.01%
Moose									
Caribou									
Ducks							72.83%	99.84%	99.83%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

APPENDIX F-4

REMEDIATION FUTURE 2 SCENARIO

**(SUMMARY TERRESTRIAL ECOLOGICAL
RECEPTOR RESULTS)**

by Pathway

Intake by Pathway (mg/kg d)

Arsenic	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.00E-04	5.35E-05	3.71E-04	1.45E-04	1.45E-04	1.45E-04	1.16E-04	3.06E-04	4.35E-05	3.01E-04	1.17E-04	1.17E-04	1.17E-04	3.09E-05	4.47E-05	1.58E-04	1.15E-04	1.66E-05	1.72E-05
Sediment							4.65E-03							7.71E-03	1.12E-02	3.95E-02	2.86E-02	4.13E-03	4.28E-03
Soil	9.88E-03	7.64E-03	5.69E-02	1.77E-02	8.22E-02	8.27E-02		8.07E-04	7.11E-03	5.29E-02	1.65E-02	7.65E-02	7.69E-02						
Fish																			
Benthic														1.57E-01	2.27E-01	8.03E-01	5.82E-01	8.40E-02	8.70E-02
Aquatic Veg							3.83E-05							1.56E-04	2.25E-04	7.98E-04	5.79E-04	8.34E-05	8.65E-05
Browse	7.40E-04	2.31E-02	2.50E-02	2.50E-02	1.01E-01	3.19E-02	1.34E-02		3.73E-02	4.04E-02	4.04E-02	1.64E-01	5.16E-02						
Forage	4.76E-05	3.41E-03	1.61E-02	2.05E-03	2.51E-02	8.26E-03		9.92E-03											
Berries									1.56E-03	5.49E-03	2.79E-04	3.33E-03	3.88E-04						
Lichen	2.68E-02																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	3.76E-02	3.42E-02	9.83E-02	4.49E-02	2.09E-01	1.23E-01	1.82E-02	1.10E-02	4.60E-02	9.92E-02	5.73E-02	2.44E-01	1.29E-01	1.65E-01	2.38E-01	8.44E-01	6.12E-01	8.82E-02	9.14E-02

Cadmium	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	2.99E-05	4.64E-05	1.39E-04	7.21E-05	7.21E-05	7.21E-05	3.45E-05	6.10E-05	3.77E-05	1.13E-04	5.85E-05	5.85E-05	5.85E-05	8.35E-06	2.23E-05	1.15E-05	4.30E-05	1.44E-05	1.44E-05
Sediment							5.70E-04							8.59E-04	2.29E-03	1.18E-03	4.42E-03	1.48E-03	1.48E-03
Soil	2.46E-03	1.00E-02	5.30E-03	1.75E-02	1.08E-02	7.79E-03		9.69E-04	9.35E-03	4.93E-03	1.62E-02	1.00E-02	7.25E-03						
Fish																			
Benthic							4.33E-02							9.97E-02	2.66E-01	1.37E-01	5.13E-01	1.71E-01	1.72E-01
Aquatic Veg							5.68E-02							1.60E-01	4.27E-01	2.20E-01	8.24E-01	2.75E-01	2.76E-01
Browse	3.14E-03	2.63E-01	2.02E-01	3.60E-02	2.33E-01	2.93E-01			4.25E-01	3.26E-01	5.82E-02	3.77E-01	4.74E-01						
Forage	2.66E-05	1.09E-02	6.05E-03	1.37E-02	6.97E-03	9.84E-03		3.31E-03											
Berries									6.90E-04	2.07E-03	7.99E-04	1.28E-03	3.59E-03						
Lichen	5.41E-03																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	1.11E-02	2.84E-01	2.13E-01	6.72E-02	2.51E-01	3.11E-01	1.01E-01	4.34E-03	4.35E-01	3.34E-01	7.53E-02	3.88E-01	4.84E-01	2.61E-01	6.95E-01	3.59E-01	1.34E+00	4.48E-01	4.49E-01

Copper	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.84E-04	4.63E-04	2.52E-04	7.35E-04	7.35E-04	7.35E-04	2.13E-04	1.65E-04	3.76E-04	2.05E-04	5.97E-04	5.97E-04	5.97E-04	4.09E-05	2.27E-04	6.89E-05	7.80E-05	1.43E-04	1.44E-04
Sediment							4.69E-02							5.61E-02	3.12E-01	9.45E-02	1.07E-01	1.96E-01	1.97E-01
Soil	4.54E-02	5.89E-02	1.43E-01	1.29E-01	4.06E-01	2.34E-01		9.69E-03	5.48E-02	1.33E-01	1.20E-01	3.78E-01	2.18E-01						
Fish																			
Benthic							2.04E-03							1.22E-01	6.78E-01	2.06E-01	2.33E-01	4.27E-01	4.30E-01
Aquatic Veg							7.07E-02							5.98E-03	3.32E-02	1.01E-02	1.14E-02	2.09E-02	2.10E-02
Browse	3.90E-03	2.30E-01	2.99E-01	2.27E-01	3.17E-01	2.89E-01			3.71E-01	4.83E-01	3.66E-01	5.13E-01	4.68E-01						
Forage	5.77E-04	1.41E-01	1.21E-01	1.45E-01	1.42E-01	1.37E-01		2.08E-01											
Berries									2.68E-02	5.95E-02	7.72E-02	4.15E-02	5.98E-02						
Lichen	8.05E-02																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	1.31E-01	4.30E-01	5.62E-01	5.02E-01	8.66E-01	6.61E-01	1.20E-01	2.18E-01	4.53E-01	6.75E-01	5.64E-01	9.33E-01	7.46E-01	1.84E-01	1.02E+00	3.10E-01	3.51E-01	6.44E-01	6.48E-01

by Pathway

Intake by Pathway (m)

Arsenic							Merganser						Scaup						Hoary Marmot					Bear		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M
Water	2.78E-05	4.02E-05	1.43E-04	1.03E-04	1.49E-05	1.55E-05	3.41E-05	4.94E-05	1.75E-04	1.27E-04	1.83E-05	1.90E-05	3.41E-05	4.94E-05	1.75E-04	1.27E-04	1.83E-05	1.90E-05	4.87E-05	3.38E-04	1.31E-04	1.31E-04	1.31E-04	3.42E-05	2.37E-04	9.24E-05
Sediment	5.00E-03	7.23E-03	2.56E-02	1.86E-02	2.68E-03	2.78E-03	3.35E-02	4.84E-02	1.71E-01	1.24E-01	1.79E-02	1.86E-02	3.35E-02	4.84E-02	1.71E-01	1.24E-01	1.79E-02	1.86E-02	3.42E-03	2.55E-02	7.93E-03	3.68E-02	3.70E-02	2.61E-03	1.23E-02	2.05E-02
Soil																								4.98E-04	3.45E-03	1.34E-03
Fish	8.37E-03	1.21E-02	4.29E-02	3.11E-02	4.48E-03	4.65E-03	2.53E-01	3.66E-01	1.30E+00	9.41E-01	1.36E-01	1.41E-01	2.53E-01	3.66E-01	1.30E+00	9.41E-01	1.36E-01	1.41E-01								
Benthic							7.54E-05	1.09E-04	3.86E-04	2.80E-04	4.03E-05	4.18E-05	7.54E-05	1.09E-04	3.86E-04	2.80E-04	4.03E-05	4.18E-05								
Aquatic Veg																										
Browse																										
Forage																										
Berries																										
Lichen																										
Hare																										
Moose																										
Caribou																										
Ducks																										
Total	1.34E-02	1.94E-02	6.86E-02	4.98E-02	7.17E-03	7.44E-03	2.87E-01	4.15E-01	1.47E+00	1.07E+00	1.54E-01	1.59E-01	2.87E-01	4.15E-01	1.47E+00	1.07E+00	1.54E-01	1.59E-01	1.08E-02	6.01E-02	1.24E-02	9.05E-02	5.48E-02	6.11E-03	2.39E-02	3.25E-02

Cadmium							Merganser						Scaup						Hoary Marmot					Bear		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M
Water	7.52E-06	2.01E-05	1.04E-05	3.87E-05	1.29E-05	1.30E-05	9.23E-06	2.46E-05	1.27E-05	4.75E-05	1.59E-05	1.59E-05	9.23E-06	2.46E-05	1.27E-05	4.75E-05	1.59E-05	1.59E-05	4.22E-05	1.27E-04	6.56E-05	6.56E-05	6.56E-05	2.97E-05	8.89E-05	4.61E-05
Sediment	5.57E-04	1.49E-03	7.67E-04	2.87E-03	9.57E-04	9.59E-04	3.73E-03	9.94E-03	5.13E-03	1.92E-02	6.40E-03	6.42E-03	3.73E-03	9.94E-03	5.13E-03	1.92E-02	6.40E-03	6.42E-03	4.50E-03	2.37E-03	7.81E-03	4.82E-03	3.49E-03	3.44E-03	2.49E-03	3.00E-03
Soil																								1.50E-03	4.48E-03	2.32E-03
Fish	7.84E-03	2.09E-02	1.08E-02	4.04E-02	1.35E-02	1.35E-02	1.61E-01	4.30E-01	2.22E-01	8.29E-01	2.77E-01	2.77E-01	1.61E-01	4.30E-01	2.22E-01	8.29E-01	2.77E-01	2.77E-01								
Benthic							7.74E-02	2.06E-01	1.07E-01	3.98E-01	1.33E-01	1.33E-01	7.74E-02	2.06E-01	1.07E-01	3.98E-01	1.33E-01	1.33E-01								
Aquatic Veg																										
Browse																										
Forage																										
Berries																										
Lichen																										
Hare																										
Moose																										
Caribou																										
Ducks																										
Total	8.41E-03	2.24E-02	1.16E-02	4.33E-02	1.44E-02	1.45E-02	2.42E-01	6.46E-01	3.34E-01	1.25E+00	4.16E-01	4.17E-01	2.42E-01	6.46E-01	3.34E-01	1.25E+00	4.16E-01	4.17E-01	2.79E-02	1.54E-02	3.71E-02	1.98E-02	2.46E-02	9.97E-03	9.98E-03	8.94E-03

Copper							Merganser						Scaup						Hoary Marmot					Bear		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M
Water	3.68E-05	2.05E-04	6.21E-05	7.02E-05	1.29E-04	1.30E-04	4.52E-05	2.51E-04	7.62E-05	8.61E-05	1.58E-04	1.59E-04	4.52E-05	2.51E-04	7.62E-05	8.61E-05	1.58E-04	1.59E-04	4.21E-04	2.29E-04	6.69E-04	6.69E-04	6.69E-04	2.96E-04	1.61E-04	4.70E-04
Sediment	3.64E-02	2.02E-01	6.13E-02	6.93E-02	1.27E-01	1.28E-01	2.43E-01	1.35E+00	4.10E-01	4.64E-01	8.51E-01	8.56E-01	2.43E-01	1.35E+00	4.10E-01	4.64E-01	8.51E-01	8.56E-01	2.63E-02	6.38E-02	5.78E-02	1.82E-01	1.05E-01	2.01E-02	3.64E-02	1.02E-01
Soil																								4.73E-02	2.58E-02	7.52E-02
Fish	1.22E-01	6.77E-01	2.05E-01	2.32E-01	4.26E-01	4.29E-01	1.97E-01	1.10E+00	3.32E-01	3.76E-01	6.90E-01	6.94E-01	1.97E-01	1.10E+00	3.32E-01	3.76E-01	6.90E-01	6.94E-01								
Benthic							2.89E-03	1.61E-02	4.87E-03	5.51E-03	1.01E-02	1.02E-02	2.89E-03	1.61E-02	4.87E-03	5.51E-03	1.01E-02	1.02E-02								
Aquatic Veg																										
Browse																										
Forage																										
Berries																										
Lichen																										
Hare																										
Moose																										
Caribou																										
Ducks																										
Total	1.58E-01	8.79E-01	2.67E-01	3.02E-01	5.53E-01	5.57E-01	4.43E-01	2.46E+00	7.47E-01	8.45E-01	1.55E+00	1.56E+00	4.43E-01	2.46E+00	7.47E-01	8.45E-01	1.55E+00	1.56E+00	3.27E-01	3.23E-01	3.68E-01	4.86E-01	3.98E-01	1.51E-01	1.68E-01	2.67E-01

by Pathway

Intake by Pathway (m)

Arsenic		Mink						Beaver						Fox		
Pathway	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	3.77E-05	1.07E-04	1.54E-04	5.46E-04	3.96E-04	5.71E-05	5.92E-05	7.76E-05	1.12E-04	3.98E-04	2.88E-04	4.16E-05	4.31E-05	4.91E-05	3.40E-04	1.33E-04
Sediment	2.32E-03	2.16E-02	3.12E-02	1.10E-01	8.01E-02	1.15E-02	1.20E-02	4.08E-03	5.90E-03	2.09E-02	1.52E-02	2.19E-03	2.27E-03	1.08E-03	5.08E-03	8.51E-03
Soil		9.55E-03	1.38E-02	4.89E-02	3.55E-02	5.11E-03	5.30E-03									
Fish		3.63E-02	5.24E-02	1.86E-01	1.35E-01	1.94E-02	2.01E-02									
Benthic		5.92E-05	8.56E-05	3.03E-04	2.20E-04	3.17E-05	3.29E-05	1.12E-04	1.62E-04	5.75E-04	4.17E-04	6.01E-05	6.23E-05			
Aquatic Veg								3.66E-03	1.16E-02	3.66E-03	3.97E-03	3.66E-03	3.97E-03			
Browse	1.73E-06													4.01E-04	5.58E-04	6.75E-04
Forage																
Berries																
Lichen																
Hare		1.05E-06	6.42E-06	1.05E-06	3.03E-06	1.05E-06	3.03E-06							2.84E-06	8.18E-06	1.74E-05
Moose	2.79E-04															
Caribou	1.01E-04															
Ducks		1.59E-03	2.29E-03	8.13E-03	5.89E-03	8.50E-04	8.81E-04							2.24E-03	1.56E-02	6.05E-03
Total	2.74E-03	6.91E-02	9.99E-02	3.54E-01	2.57E-01	3.70E-02	3.84E-02	7.94E-03	1.78E-02	2.56E-02	1.98E-02	5.95E-03	6.34E-03	3.78E-03	2.15E-02	1.54E-02

Cadmium		Mink						Beaver						Fox		
Pathway	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.12E-05	2.88E-05	7.69E-05	3.97E-05	1.48E-04	4.95E-05	4.96E-05	2.10E-05	5.60E-05	2.89E-05	1.08E-04	3.60E-05	3.61E-05	4.26E-05	1.28E-04	6.61E-05
Sediment	5.79E-04	2.40E-03	6.41E-03	3.31E-03	1.24E-02	4.13E-03	4.13E-03	4.55E-04	1.21E-03	6.27E-04	2.34E-03	7.81E-04	7.83E-04	1.43E-03	1.03E-03	1.24E-03
Soil		8.95E-03	2.39E-02	1.23E-02	4.61E-02	1.54E-02	1.54E-02									
Fish		2.30E-02	6.15E-02	3.18E-02	1.19E-01	3.96E-02	3.97E-02									
Benthic		6.08E-02	1.62E-01	8.38E-02	3.13E-01	1.05E-01	1.05E-01	1.15E-01	3.07E-01	1.59E-01	5.93E-01	1.98E-01	1.98E-01			
Aquatic Veg								4.18E-02	3.50E-02	4.18E-02	8.53E-02	4.18E-02	8.53E-02			
Browse	2.67E-06													1.78E-04	1.84E-04	2.85E-04
Forage																
Berries																
Lichen																
Hare		3.44E-06	6.94E-06	3.44E-06	4.50E-06	3.44E-06	4.50E-06							9.30E-06	1.22E-05	1.87E-05
Moose	4.78E-04															
Caribou	9.11E-05															
Ducks		2.33E-03	1.30E-02	3.93E-03	4.44E-03	8.16E-03	8.21E-03							2.15E-02	1.17E-02	3.42E-02
Total	1.16E-03	9.76E-02	2.67E-01	1.35E-01	4.95E-01	1.72E-01	1.72E-01	1.57E-01	3.44E-01	2.01E-01	6.81E-01	2.41E-01	2.85E-01	2.32E-02	1.31E-02	3.58E-02

Copper		Mink						Beaver						Fox		
Pathway	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	6.92E-05	1.41E-04	7.84E-04	2.38E-04	2.69E-04	4.93E-04	4.96E-04	1.03E-04	5.71E-04	1.73E-04	1.96E-04	3.59E-04	3.61E-04	4.24E-04	2.31E-04	6.74E-04
Sediment	1.07E-02	1.57E-01	8.71E-01	2.64E-01	2.99E-01	5.48E-01	5.52E-01	2.97E-02	1.65E-01	5.00E-02	5.66E-02	1.04E-01	1.04E-01	8.35E-03	1.51E-02	4.22E-02
Soil		1.39E-01	7.72E-01	2.34E-01	2.65E-01	4.86E-01	4.89E-01									
Fish		2.82E-02	1.57E-01	4.76E-02	5.38E-02	9.87E-02	9.93E-02									
Benthic		2.27E-03	1.26E-02	3.83E-03	4.33E-03	7.95E-03	8.00E-03	4.30E-03	2.39E-02	7.26E-03	8.20E-03	1.51E-02	1.51E-02			
Aquatic Veg								3.65E-02	4.66E-02	3.65E-02	5.88E-02	3.65E-02	5.88E-02			
Browse	5.14E-05													6.90E-03	1.40E-02	1.00E-02
Forage																
Berries																
Lichen																
Hare		6.62E-05	1.33E-04	6.62E-05	8.66E-05	6.62E-05	8.66E-05							1.79E-04	2.34E-04	3.60E-04
Moose	9.19E-03															
Caribou	1.75E-03															
Ducks		1.46E-03	8.10E-03	2.46E-03	2.78E-03	5.10E-03	5.13E-03							1.35E-02	7.33E-03	2.14E-02
Total	2.17E-02	3.28E-01	1.82E+00	5.53E-01	6.25E-01	1.15E+00	1.15E+00	7.06E-02	2.36E-01	9.39E-02	1.24E-01	1.56E-01	1.79E-01	2.93E-02	3.69E-02	7.46E-02

by Pathway

Lead	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	2.18E-04	3.96E-04	8.40E-04	3.97E-04	3.97E-04	3.97E-04	2.52E-04	4.33E-04	3.21E-04	6.82E-04	3.22E-04	3.22E-04	3.22E-04	7.72E-05	1.23E-04	1.27E-04	2.60E-04	1.22E-04	1.22E-04
Sediment							3.33E-02							6.35E-02	1.01E-01	1.05E-01	2.14E-01	1.01E-01	1.00E-01
Soil	6.91E-01	4.69E-02	1.01E+00	9.32E-01	8.20E+00	3.73E+00		2.91E-02	4.37E-02	9.38E-01	8.68E-01	7.63E+00	3.47E+00						
Fish																			
Benthic							2.50E-03							2.30E-02	3.66E-02	3.80E-02	7.75E-02	3.65E-02	3.63E-02
Aquatic Veg							1.46E-01							1.17E-02	1.86E-02	1.93E-02	3.93E-02	1.85E-02	1.84E-02
Browse	8.09E-03	1.38E-02	1.32E-01	7.10E-01	1.32E+00	6.31E-02			2.24E-02	2.13E-01	1.15E+00	2.13E+00	1.02E-01						
Forage	1.04E-03	2.77E-03	1.18E-01	1.94E-02	8.80E-01	6.39E-02													
Berries								1.20E-02	7.02E-04	9.71E-03	7.98E-03	2.46E-02	3.96E-03						
Lichen	1.41E+00																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	2.11E+00	6.39E-02	1.26E+00	1.66E+00	1.04E+01	3.86E+00	1.83E-01	4.15E-02	6.70E-02	1.16E+00	2.02E+00	9.79E+00	3.58E+00	9.83E-02	1.56E-01	1.62E-01	3.31E-01	1.56E-01	1.55E-01

Manganese	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.18E-03	1.30E-03	2.22E-03	3.48E-03	3.48E-03	3.48E-03	1.36E-03	1.45E-03	1.06E-03	1.80E-03	2.82E-03	2.82E-03	2.82E-03	1.29E-03	1.08E-03	6.12E-04	6.86E-04	4.02E-04	4.14E-04
Sediment							1.08E-01							6.37E-01	5.31E-01	3.02E-01	3.38E-01	1.98E-01	2.04E-01
Soil	7.58E-01	4.07E+00	5.63E+00	1.67E+00	1.49E+00	2.18E+00		1.07E+00	3.79E+00	5.24E+00	1.56E+00	1.39E+00	2.03E+00						
Fish																			
Benthic							1.53E-02							3.85E+00	3.21E+00	1.83E+00	2.05E+00	1.20E+00	1.24E+00
Aquatic Veg							8.27E+00							2.21E-01	1.84E-01	1.05E-01	1.18E-01	6.89E-02	7.10E-02
Browse	4.57E-01	3.96E+01	3.91E+01	1.16E+01	1.04E+01	5.10E+01			6.41E+01	6.33E+01	1.88E+01	1.68E+01	8.24E+01						
Forage	6.27E-02	1.70E+01	1.59E+01	1.83E+01	1.21E+01	3.34E+01		1.77E+01											
Berries									1.09E+00	3.26E-01	3.37E+00	8.54E-01	1.55E+00						
Lichen	1.89E+00																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	3.17E+00	6.08E+01	6.06E+01	3.16E+01	2.40E+01	8.65E+01	8.40E+00	1.88E+01	6.90E+01	6.89E+01	2.37E+01	1.90E+01	8.60E+01	4.71E+00	3.93E+00	2.23E+00	2.50E+00	1.47E+00	1.51E+00

Nickel	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.77E-04	9.29E-05	9.49E-04	3.61E-04	3.61E-04	3.61E-04	2.04E-04	5.19E-04	7.54E-05	7.70E-04	2.93E-04	2.93E-04	2.93E-04	3.91E-05	1.11E-04	1.70E-04	2.93E-04	2.87E-05	3.01E-05
Sediment							1.53E-02							1.82E-02	5.20E-02	7.94E-02	1.37E-01	1.34E-02	1.41E-02
Soil	1.05E-02	2.72E-02	9.78E-02	2.42E-02	5.45E-02	4.66E-02		1.61E-03	2.53E-02	9.11E-02	2.26E-02	5.07E-02	4.34E-02						
Fish																			
Benthic							2.02E-04							1.17E-02	3.33E-02	5.08E-02	8.75E-02	8.56E-03	8.99E-03
Aquatic Veg							4.72E-02							5.92E-04	1.69E-03	2.58E-03	4.43E-03	4.34E-04	4.56E-04
Browse	2.61E-03	1.52E-01	1.79E-01	3.00E-02	2.02E-01	3.05E-01			2.46E-01	2.90E-01	4.85E-02	3.26E-01	4.94E-01						
Forage	2.27E-04	2.32E-02	6.73E-02	6.16E-02	4.45E-02	2.14E-01													
Berries									4.29E-03	8.91E-03	6.20E-03	5.09E-03	3.40E-02						
Lichen	1.34E-02																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	2.69E-02	2.03E-01	3.45E-01	1.16E-01	3.01E-01	5.67E-01	6.29E-02	9.72E-02	2.76E-01	3.90E-01	7.76E-02	3.83E-01	5.71E-01	3.05E-02	8.70E-02	1.33E-01	2.29E-01	2.24E-02	2.35E-02

by Pathway

Lead	Merganser						Scaup						Hoary Marmot					Bear			
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M	
Water	6.95E-05	1.11E-04	1.15E-04	2.34E-04	1.10E-04	1.10E-04	8.53E-05	1.36E-04	1.41E-04	2.87E-04	1.35E-04	1.34E-04	3.60E-04	7.64E-04	3.61E-04	3.61E-04	3.61E-04	2.53E-04	5.37E-04	2.54E-04	
Sediment	4.12E-02	6.54E-02	6.79E-02	1.38E-01	6.52E-02	6.48E-02	2.75E-01	4.38E-01	4.54E-01	9.27E-01	4.37E-01	4.34E-01	2.10E-02	4.51E-01	4.17E-01	3.67E+00	1.67E+00	1.61E-02	2.04E-01	1.95E+00	
Soil	2.29E-02	3.64E-02	3.78E-02	7.71E-02	3.63E-02	3.61E-02	3.72E-02	5.92E-02	6.14E-02	1.25E-01	5.90E-02	5.86E-02		5.92E-03	2.52E-01	4.13E-02	1.88E+00	1.36E-01	4.04E-03	8.56E-03	4.05E-03
Fish																					
Benthic																					
Aquatic Veg																					
Browse	5.92E-03	2.52E-01	4.13E-02	1.88E+00	1.36E-01	1.04E-03	3.93E-02	2.37E-01													
Forage						6.93E-04	3.65E-03	2.06E-02													
Berries																					
Lichen																					
Hare																					
Moose																					
Caribou																					
Ducks																					
Total	6.41E-02	1.02E-01	1.06E-01	2.16E-01	1.02E-01	1.01E-01	3.18E-01	5.06E-01	5.25E-01	1.07E+00	5.05E-01	5.02E-01	2.73E-02	7.04E-01	4.59E-01	5.55E+00	1.81E+00	2.33E-02	2.57E-01	2.21E+00	

Manganese	Merganser						Scaup						Hoary Marmot					Bear		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M
Water	1.16E-03	9.69E-04	5.51E-04	6.17E-04	3.62E-04	3.73E-04	1.43E-03	1.19E-03	6.76E-04	7.57E-04	4.44E-04	4.58E-04	1.18E-03	2.02E-03	3.17E-03	3.17E-03	3.17E-03	8.31E-04	1.42E-03	2.23E-03
Sediment	4.13E-01	3.44E-01	1.96E-01	2.19E-01	1.29E-01	1.33E-01	2.76E+00	2.30E+00	1.31E+00	1.47E+00	8.60E-01	8.87E-01								
Soil													1.82E+00	2.52E+00	7.49E-01	6.69E-01	9.74E-01	1.39E+00	1.80E+00	1.02E+00
Fish	1.10E+00	9.21E-01	5.24E-01	5.87E-01	3.44E-01	3.55E-01												3.82E-02	6.52E-02	1.02E-01
Benthic							6.22E+00	5.19E+00	2.95E+00	3.31E+00	1.94E+00	2.00E+00								
Aquatic Veg							1.07E-01	8.92E-02	5.07E-02	5.68E-02	3.33E-02	3.43E-02								
Browse													3.64E+01	3.38E+01	3.90E+01	2.58E+01	7.13E+01	6.41E+00	1.46E+01	8.09E+00
Forage																		1.07E+00	6.59E-01	7.68E-01
Berries																				
Lichen																				
Hare																				
Moose																		1.17E-02	1.17E-02	1.17E-02
Caribou																		7.72E-04	7.72E-04	7.72E-04
Ducks																				
Total	1.52E+00	1.27E+00	7.20E-01	8.07E-01	4.73E-01	4.88E-01	9.09E+00	7.58E+00	4.31E+00	4.83E+00	2.83E+00	2.92E+00	3.82E+01	3.64E+01	3.97E+01	2.64E+01	7.22E+01	8.93E+00	1.72E+01	1.00E+01

Nickel	Merganser						Scaup						Hoary Marmot					Bear		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M
Water	3.52E-05	1.00E-04	1.53E-04	2.64E-04	2.59E-05	2.71E-05	4.32E-05	1.23E-04	1.88E-04	3.24E-04	3.17E-05	3.33E-05	8.44E-05	8.63E-04	3.28E-04	3.28E-04	3.28E-04	5.94E-05	6.07E-04	2.31E-04
Sediment	1.18E-02	3.37E-02	5.15E-02	8.86E-02	8.67E-03	9.11E-03	7.91E-02	2.25E-01	3.44E-01	5.93E-01	5.80E-02	6.10E-02								
Soil													1.22E-02	4.38E-02	1.08E-02	2.44E-02	2.09E-02	9.30E-03	2.46E-02	1.86E-02
Fish	8.20E-03	2.34E-02	3.57E-02	6.15E-02	6.02E-03	6.32E-03												6.68E-04	6.83E-03	2.59E-03
Benthic							1.89E-02	5.37E-02	8.21E-02	1.41E-01	1.38E-02	1.45E-02								
Aquatic Veg							2.86E-04	8.15E-04	1.25E-03	2.14E-03	2.10E-04	2.20E-04								
Browse													4.96E-02	1.44E-01	1.31E-01	9.50E-02	4.58E-01	8.74E-03	2.30E-02	1.63E-02
Forage																		4.24E-03	1.82E-02	5.57E-03
Berries																				
Lichen																				
Hare																				
Moose																		1.05E-03	1.05E-03	1.05E-03
Caribou																		7.85E-05	7.85E-05	7.85E-05
Ducks																				
Total	2.01E-02	5.71E-02	8.73E-02	1.50E-01	1.47E-02	1.55E-02	9.83E-02	2.80E-01	4.28E-01	7.37E-01	7.21E-02	7.58E-02	6.19E-02	1.88E-01	1.43E-01	1.20E-01	4.79E-01	2.41E-02	7.44E-02	4.44E-02

by Pathway

Lead	Wolf	Mink						Beaver						Fox								
Pathway	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M						
Water	8.19E-05	2.66E-04	4.23E-04	4.39E-04	8.95E-04	4.22E-04	4.19E-04	1.94E-04	3.08E-04	3.20E-04	6.52E-04	3.07E-04	3.05E-04	3.63E-04	7.70E-04	3.64E-04						
Sediment	1.62E-01	1.77E-01	2.82E-01	2.93E-01	5.97E-01	2.81E-01	2.80E-01	3.36E-02	5.34E-02	5.55E-02	1.13E-01	5.33E-02	5.30E-02	6.66E-03	8.45E-02	8.08E-01						
Soil		2.61E-02	4.16E-02	4.31E-02	8.80E-02	4.14E-02	4.12E-02	8.40E-03	1.34E-02	1.39E-02	2.83E-02	1.33E-02	1.32E-02									
Fish		5.32E-03	8.46E-03	8.78E-03	1.79E-02	8.44E-03	8.39E-03															
Benthic		4.44E-03	7.05E-03	7.32E-03	1.49E-02	7.03E-03	6.99E-03															
Aquatic Veg	4.11E-03	1.38E-04	2.24E-02	1.38E-04	2.71E-03	1.38E-04	2.71E-03	2.19E-03	1.42E-01	2.19E-03	1.73E-02	2.19E-03	1.73E-02	1.81E-04	9.50E-04	5.38E-03						
Browse																						
Forage																						
Berries																						
Lichen	5.60E-04													3.72E-04	7.33E-03	6.05E-02						
Hare																						
Moose																						
Caribou																						
Ducks	2.83E-03	3.38E-04	5.38E-04	5.58E-04	1.14E-03	5.36E-04	5.33E-04	4.44E-02	2.09E-01	7.18E-02	1.59E-01	6.91E-02	8.39E-02	1.42E-03	3.00E-03	1.42E-03						
Total	1.70E-01	2.14E-01	3.63E-01	3.53E-01	7.23E-01	3.39E-01	3.40E-01							8.99E-03	9.65E-02	8.76E-01						

Manganese	Wolf	Mink						Beaver						Fox														
Pathway	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M												
Water	4.42E-04	4.45E-03	3.71E-03	2.11E-03	2.36E-03	1.39E-03	1.43E-03	3.24E-03	2.70E-03	1.54E-03	1.72E-03	1.01E-03	1.04E-03	1.19E-03	2.03E-03	3.19E-03												
Sediment	1.78E-01	1.78E+00	1.48E+00	8.44E-01	9.46E-01	5.54E-01	5.72E-01	3.37E-01	2.81E-01	1.60E-01	1.79E-01	1.05E-01	1.08E-01	5.78E-01	7.46E-01	4.24E-01												
Soil		1.26E+00	1.05E+00	5.97E-01	6.70E-01	3.92E-01	4.05E-01	1.59E-01	1.33E-01	7.55E-02	8.46E-02	4.96E-02	5.11E-02															
Fish		8.90E-01	7.42E-01	4.22E-01	4.73E-01	2.77E-01	2.86E-01																					
Benthic		8.41E-02	7.01E-02	3.98E-02	4.47E-02	2.62E-02	2.70E-02																					
Aquatic Veg	2.24E-04	4.68E-04	1.84E-04	4.68E-04	4.67E-04	4.68E-04	4.67E-04	6.29E+00	2.45E+01	6.29E+00	5.80E+00	6.29E+00	5.80E+00	2.80E-01	1.72E-01	2.00E-01												
Browse																												
Forage																												
Berries																												
Lichen	3.22E-02													1.26E-03	1.26E-03	4.98E-04												
Hare																												
Moose																												
Caribou																												
Ducks	2.13E-03	2.71E-03	2.26E-03	1.28E-03	1.44E-03	8.44E-04	8.70E-04	6.79E+00	2.49E+01	6.53E+00	6.07E+00	6.45E+00	5.96E+00	2.23E-03	3.80E-03	5.96E-03												
Total	2.13E-01	4.02E+00	3.35E+00	1.91E+00	2.14E+00	1.25E+00	1.29E+00							8.63E-01	9.25E-01	6.33E-01												

Nickel	Wolf	Mink						Beaver						Fox														
Pathway	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M												
Water	6.63E-05	1.35E-04	3.84E-04	5.87E-04	1.01E-03	9.90E-05	1.04E-04	9.82E-05	2.80E-04	4.28E-04	7.36E-04	7.21E-05	7.57E-05	8.51E-05	8.69E-04	3.31E-04												
Sediment	2.46E-03	5.10E-02	1.45E-01	2.22E-01	3.82E-01	3.74E-02	3.93E-02	9.65E-03	2.75E-02	4.20E-02	7.24E-02	7.08E-03	7.44E-03	3.86E-03	1.02E-02	7.71E-03												
Soil		9.36E-03	2.67E-02	4.07E-02	7.01E-02	6.86E-03	7.21E-03	4.26E-04	1.21E-03	1.85E-03	3.19E-03	3.13E-04	3.28E-04															
Fish		2.70E-03	7.69E-03	1.17E-02	2.02E-02	1.98E-03	2.08E-03																					
Benthic		2.25E-04	6.41E-04	9.79E-04	1.69E-03	1.65E-04	1.73E-04																					
Aquatic Veg	1.56E-05	1.87E-05	2.78E-05	1.87E-05	3.19E-05	1.87E-05	3.19E-05	2.42E-02	2.99E-02	2.42E-02	3.30E-02	2.42E-02	3.30E-02	1.10E-03	4.75E-03	1.45E-03												
Browse																												
Forage																												
Berries																												
Lichen	2.90E-03													5.07E-05	8.62E-05	7.52E-05												
Hare																												
Moose																												
Caribou																												
Ducks	2.16E-04	1.57E-03	4.48E-03	6.85E-03	1.18E-02	1.15E-03	1.21E-03	3.44E-02	5.89E-02	6.85E-02	1.09E-01	3.17E-02	4.09E-02	3.05E-03	3.11E-02	1.18E-02												
Total	5.65E-03	6.50E-02	1.85E-01	2.83E-01	4.87E-01	4.77E-02	5.01E-02							8.14E-03	4.70E-02	2.14E-02												

by Pathway

Silver	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.12E-05	9.29E-06	3.63E-05	9.93E-06	9.93E-06	9.93E-06	1.29E-05	3.79E-05	7.54E-06	2.94E-05	8.06E-06	8.06E-06	8.06E-06	2.87E-06	3.07E-06	2.26E-05	1.12E-05	2.87E-06	8.47E-08
Sediment							5.02E-05							6.93E-05	7.41E-05	5.46E-04	2.70E-04	6.93E-05	2.04E-06
Soil	1.46E-03	4.60E-03	4.07E-03	4.07E-03	9.63E-03	4.07E-03		1.61E-03	4.28E-03	3.79E-03	3.79E-03	8.96E-03	3.79E-03						
Fish																			
Benthic														1.71E-03	1.83E-03	1.35E-02	6.69E-03	1.71E-03	5.06E-05
Aquatic Veg							8.56E-04							2.89E-03	3.10E-03	2.28E-02	1.13E-02	2.89E-03	8.54E-05
Browse	3.34E-05	6.10E-04	5.43E-03	5.00E-04	4.14E-03	2.23E-03	6.05E-04		9.87E-04	8.79E-03	8.09E-04	6.70E-03	3.61E-03						
Forage	4.05E-06	4.05E-04	1.38E-03	1.20E-03	1.31E-03	5.00E-03													
Berries								5.05E-04	1.64E-04	2.62E-04	4.92E-04	5.14E-05	4.06E-04						
Lichen	3.57E-03																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	5.08E-03	5.62E-03	1.09E-02	5.78E-03	1.51E-02	1.13E-02	1.52E-03	2.16E-03	5.44E-03	1.29E-02	5.10E-03	1.57E-02	7.82E-03	4.68E-03	5.01E-03	3.69E-02	1.83E-02	4.68E-03	1.38E-04

Thallium	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment							n/a							n/a	n/a	n/a	n/a	n/a	n/a
Soil	n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a						
Fish																			
Benthic														n/a	n/a	n/a	n/a	n/a	n/a
Aquatic Veg							n/a							n/a	n/a	n/a	n/a	n/a	n/a
Browse	7.82E-06	5.68E-04	7.52E-04	7.52E-04	7.52E-04	7.52E-04	1.42E-04		9.19E-04	1.22E-03	1.22E-03	1.22E-03	1.22E-03						
Forage	4.11E-06	3.08E-04	3.72E-04	3.62E-04	3.61E-03	2.44E-04		1.84E-03											
Berries									7.35E-05	6.46E-05	5.57E-05	8.44E-05	7.76E-05						
Lichen	1.59E-03																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	1.60E-03	8.77E-04	1.12E-03	1.11E-03	4.37E-03	9.96E-04	1.42E-04	1.84E-03	9.92E-04	1.28E-03	1.27E-03	1.30E-03	1.29E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Tin	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment							n/a							n/a	n/a	n/a	n/a	n/a	n/a
Soil	3.70E-03	1.02E-02	3.18E-02	1.66E-02	1.28E-02	1.57E-02		1.13E-02	9.47E-03	2.96E-02	1.54E-02	1.19E-02	1.46E-02						
Fish																			
Benthic														n/a	n/a	n/a	n/a	n/a	n/a
Aquatic Veg							n/a							n/a	n/a	n/a	n/a	n/a	n/a
Browse	9.98E-05	1.20E-02	2.01E-02	1.05E-02	8.09E-03	3.76E-03	1.81E-03		1.93E-02	3.25E-02	1.69E-02	1.31E-02	6.08E-03						
Forage	2.02E-05	8.95E-03	1.86E-03	6.42E-03	1.89E-03	6.61E-03		7.29E-03											
Berries									6.08E-04	3.23E-04	3.09E-02	2.91E-03	3.88E-04						
Lichen	1.85E-02																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	2.23E-02	3.11E-02	5.37E-02	3.34E-02	2.28E-02	2.61E-02	1.81E-03	1.86E-02	2.94E-02	6.24E-02	6.32E-02	2.79E-02	2.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

by Pathway

Silver	Merganser						Scaup						Hoary Marmot					Bear		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M
Water	2.59E-06	2.77E-06	2.04E-05	1.01E-05	2.59E-06	7.63E-08	3.17E-06	3.39E-06	2.50E-05	1.24E-05	3.17E-06	9.36E-08	8.44E-06	3.30E-05	9.03E-06	9.03E-06	9.03E-06	5.94E-06	2.32E-05	6.35E-06
Sediment	4.49E-05	4.80E-05	3.54E-04	1.75E-04	4.49E-05	1.32E-06	3.00E-04	3.21E-04	2.37E-03	1.17E-03	3.00E-04	8.87E-06								
Soil													2.06E-03	1.82E-03	1.82E-03	4.31E-03	1.82E-03	1.57E-03	1.39E-03	2.59E-03
Fish	4.34E-03	4.64E-03	3.42E-02	1.69E-02	4.34E-03	1.28E-04												4.82E-04	1.88E-03	5.15E-04
Benthic							2.77E-03	2.96E-03	2.18E-02	1.08E-02	2.77E-03	8.17E-05								
Aquatic Veg							1.40E-03	1.50E-03	1.10E-02	5.46E-03	1.40E-03	4.13E-05								
Browse													8.63E-04	2.95E-03	2.56E-03	2.79E-03	1.07E-02	1.52E-04	4.65E-04	3.64E-04
Forage																		1.62E-04	1.37E-04	4.60E-05
Berries																				
Lichen																				
Hare																				
Moose																		1.27E-05	1.27E-05	1.27E-05
Caribou																		7.43E-06	7.43E-06	7.43E-06
Ducks																				
Total	4.38E-03	4.69E-03	3.46E-02	1.71E-02	4.38E-03	1.29E-04	4.47E-03	4.78E-03	3.53E-02	1.75E-02	4.47E-03	1.32E-04	2.93E-03	4.81E-03	4.40E-03	7.11E-03	1.25E-02	2.40E-03	3.92E-03	3.54E-03

Thallium	Merganser						Scaup						Hoary Marmot					Bear		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a								
Soil													n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fish	n/a	n/a	n/a	n/a	n/a	n/a														
Benthic							n/a	n/a	n/a	n/a	n/a	n/a								
Aquatic Veg							n/a	n/a	n/a	n/a	n/a	n/a								
Browse													6.58E-04	7.94E-04	7.72E-04	7.71E-03	5.20E-04	1.16E-04	2.13E-04	1.10E-03
Forage																		7.27E-05	1.27E-04	7.55E-05
Berries																				
Lichen																				
Hare																				
Moose																		1.18E-05	1.18E-05	1.18E-05
Caribou																		2.34E-05	2.34E-05	2.34E-05
Ducks																				
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.58E-04	7.94E-04	7.72E-04	7.71E-03	5.20E-04	2.24E-04	3.75E-04	1.21E-03

Tin	Merganser						Scaup						Hoary Marmot					Bear		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a								
Soil													4.56E-03	1.42E-02	7.41E-03	5.73E-03	7.04E-03	3.48E-03	7.00E-03	4.99E-03
Fish	n/a	n/a	n/a	n/a	n/a	n/a												n/a	n/a	n/a
Benthic							n/a	n/a	n/a	n/a	n/a	n/a								
Aquatic Veg							n/a	n/a	n/a	n/a	n/a	n/a								
Browse													1.91E-02	3.97E-03	1.37E-02	4.03E-03	1.41E-02	3.37E-03	1.06E-03	8.08E-04
Forage																		6.01E-04	6.36E-04	1.53E-03
Berries																				
Lichen																				
Hare																				
Moose																		1.51E-04	1.51E-04	1.51E-04
Caribou																		3.26E-04	3.26E-04	3.26E-04
Ducks																				
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.37E-02	1.82E-02	2.11E-02	9.76E-03	2.12E-02	7.93E-03	9.17E-03	7.81E-03

by Pathway

Silver	Wolf	Mink						Beaver						Fox		
Pathway	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	4.21E-06	9.90E-06	1.06E-05	7.81E-05	3.87E-05	9.90E-06	2.92E-07	7.21E-06	7.71E-06	5.69E-05	2.81E-05	7.21E-06	2.13E-07	8.51E-06	3.32E-05	9.11E-06
Sediment		1.94E-04	2.07E-04	1.53E-03	7.56E-04	1.94E-04	5.71E-06	3.67E-05	3.92E-05	2.89E-04	1.43E-04	3.67E-05	1.08E-06			
Soil	3.44E-04													6.53E-04	5.78E-04	1.07E-03
Fish		4.95E-03	5.29E-03	3.90E-02	1.93E-02	4.95E-03	1.46E-04									
Benthic		3.96E-04	4.24E-04	3.12E-03	1.55E-03	3.96E-04	1.17E-05									
Aquatic Veg		1.10E-03	1.18E-03	8.68E-03	4.30E-03	1.10E-03	3.25E-05	2.08E-03	2.23E-03	1.64E-02	8.14E-03	2.08E-03	6.15E-05			
Browse								9.69E-05	4.97E-04	9.69E-05	6.84E-04	9.69E-05	6.84E-04			
Forage																
Berries														4.22E-05	3.56E-05	1.20E-05
Lichen																
Hare	2.49E-07	2.60E-07	6.97E-07	2.60E-07	5.05E-07	2.60E-07	5.05E-07							7.02E-07	1.36E-06	1.88E-06
Moose	3.51E-05															
Caribou	2.05E-05															
Ducks		1.11E-04	1.19E-04	8.77E-04	4.34E-04	1.11E-04	3.28E-06							2.93E-04	1.15E-03	3.14E-04
Total	4.04E-04	6.76E-03	7.23E-03	5.33E-02	2.64E-02	6.76E-03	2.00E-04	2.22E-03	2.77E-03	1.69E-02	8.99E-03	2.22E-03	7.46E-04	9.98E-04	1.79E-03	1.41E-03

Thallium	Wolf	Mink						Beaver						Fox		
Pathway	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
Soil	n/a													n/a	n/a	n/a
Fish		n/a	n/a	n/a	n/a	n/a	n/a									
Benthic		n/a	n/a	n/a	n/a	n/a	n/a									
Aquatic Veg		n/a	n/a	n/a	n/a	n/a	n/a									
Browse								n/a	n/a	n/a	n/a	n/a	n/a			
Forage								9.02E-05	9.29E-05	9.02E-05	1.19E-04	9.02E-05	1.19E-04			
Berries														1.89E-05	3.32E-05	1.97E-05
Lichen																
Hare	4.33E-07	4.05E-07	2.02E-06	4.05E-07	5.19E-07	4.05E-07	5.19E-07							1.09E-06	1.40E-06	5.45E-06
Moose	3.26E-05															
Caribou	6.44E-05															
Ducks		n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a
Total	9.75E-05	4.05E-07	2.02E-06	4.05E-07	5.19E-07	4.05E-07	5.19E-07	9.02E-05	9.29E-05	9.02E-05	1.19E-04	9.02E-05	1.19E-04	2.00E-05	3.46E-05	2.51E-05

Tin	Wolf	Mink						Beaver						Fox		
Pathway	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
Soil	8.70E-04													1.44E-03	2.90E-03	2.07E-03
Fish		n/a	n/a	n/a	n/a	n/a	n/a									
Benthic		n/a	n/a	n/a	n/a	n/a	n/a									
Aquatic Veg		n/a	n/a	n/a	n/a	n/a	n/a									
Browse								n/a	n/a	n/a	n/a	n/a	n/a			
Forage								1.90E-03	4.79E-03	1.90E-03	2.05E-03	1.90E-03	2.05E-03			
Berries														1.57E-04	1.66E-04	3.98E-04
Lichen																
Hare	8.53E-06	1.44E-05	1.05E-05	1.44E-05	2.48E-05	1.44E-05	2.48E-05							3.88E-05	6.71E-05	2.84E-05
Moose	4.16E-04															
Caribou	8.99E-04															
Ducks		n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a
Total	2.19E-03	1.44E-05	1.05E-05	1.44E-05	2.48E-05	1.44E-05	2.48E-05	1.90E-03	4.79E-03	1.90E-03	2.05E-03	1.90E-03	2.05E-03	1.64E-03	3.13E-03	2.50E-03

by Pathway

Zinc	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.90E-03	7.77E-04	3.39E-03	1.23E-02	1.23E-02	1.23E-02	2.19E-03	1.80E-03	6.30E-04	2.75E-03	9.98E-03	9.98E-03	9.98E-03	1.29E-03	3.80E-03	5.62E-04	1.05E-03	2.40E-04	2.86E-04
Sediment	5.63E-01	6.50E-01	1.83E+00	1.00E+00	5.02E+00	2.99E+00	7.63E-02	2.73E-01	6.05E-01	1.70E+00	9.35E-01	4.68E+00	2.78E+00	2.80E-01	8.23E-01	1.22E-01	2.27E-01	5.20E-02	6.20E-02
Fish																			
Benthic							1.88E-01							1.04E+01	3.05E+01	4.50E+00	8.41E+00	1.93E+00	2.30E+00
Aquatic Veg							4.82E+00							1.69E+00	4.98E+00	7.36E-01	1.37E+00	3.15E-01	3.75E-01
Browse	2.66E-01	1.25E+01	8.38E+00	9.45E+00	3.23E+01	2.57E+01			2.03E+01	1.35E+01	1.53E+01	5.23E+01	4.16E+01						
Forage	1.30E-02	1.44E+00	1.30E+01	2.00E+00	4.61E+00	2.48E+00		1.49E+00											
Berries									9.39E-02	1.48E-01	8.12E-02	2.44E-01	2.49E-01						
Lichen	2.13E+00																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	2.97E+00	1.46E+01	2.32E+01	1.25E+01	4.20E+01	3.12E+01	5.09E+00	1.76E+00	2.10E+01	1.54E+01	1.63E+01	5.72E+01	4.46E+01	1.23E+01	3.63E+01	5.36E+00	1.00E+01	2.29E+00	2.73E+00

by Pathway

Zinc	Merganser						Scaup						Heary Marmot					Bear		
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M	Faro-M
Water	1.16E-03	3.42E-03	5.06E-04	9.45E-04	2.16E-04	2.58E-04	1.43E-03	4.20E-03	6.21E-04	1.16E-03	2.65E-04	3.16E-04	7.06E-04	3.09E-03	1.12E-02	1.12E-02	1.12E-02	4.97E-04	2.17E-03	7.86E-03
Sediment	1.81E-01	5.34E-01	7.89E-02	1.47E-01	3.37E-02	4.02E-02	1.21E+00	3.57E+00	5.28E-01	9.86E-01	2.26E-01	2.69E-01								
Soil													2.91E-01	8.19E-01	4.50E-01	2.25E+00	1.34E+00	2.23E-01	4.56E-01	1.31E+00
Fish	6.06E+00	1.78E+01	2.64E+00	4.92E+00	1.13E+00	1.34E+00												1.25E-01	5.47E-01	1.98E+00
Benthic							1.67E+01	4.93E+01	7.28E+00	1.36E+01	3.11E+00	3.71E+00								
Aquatic Veg							8.19E-01	2.41E+00	3.56E-01	6.65E-01	1.52E-01	1.81E-01								
Browse																				
Forage													3.07E+00	2.77E+01	4.27E+00	9.84E+00	5.29E+00	5.42E-01	4.26E+00	1.38E+00
Berries																		9.28E-02	1.66E-01	2.03E-01
Lichen																				
Hare																				
Moose																		1.42E+00	1.42E+00	1.42E+00
Caribou																		1.45E-01	1.45E-01	1.45E-01
Ducks																				
Total	6.25E+00	1.84E+01	2.72E+00	5.07E+00	1.16E+00	1.38E+00	1.88E+01	5.52E+01	8.16E+00	1.52E+01	3.49E+00	4.16E+00	3.36E+00	2.86E+01	4.73E+00	1.21E+01	6.64E+00	2.54E+00	6.99E+00	6.44E+00

by Pathway

Zinc	Wolf	Mink						Beaver						Fox		
Pathway	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	7.13E-04	4.46E-03	1.31E-02	1.94E-03	3.62E-03	8.28E-04	9.87E-04	3.24E-03	9.55E-03	1.41E-03	2.63E-03	6.03E-04	7.19E-04	7.12E-04	3.11E-03	1.13E-02
Sediment		7.82E-01	2.30E+00	3.40E-01	6.35E-01	1.45E-01	1.73E-01	1.48E-01	4.36E-01	6.44E-02	1.20E-01	2.75E-02	3.28E-02			
Soil	1.32E-01													9.23E-02	1.89E-01	5.44E-01
Fish		6.92E+00	2.04E+01	3.01E+00	5.62E+00	1.29E+00	1.53E+00									
Benthic		2.39E+00	7.05E+00	1.04E+00	1.94E+00	4.45E-01	5.31E-01									
Aquatic Veg		6.44E-01	1.89E+00	2.80E-01	5.23E-01	1.20E-01	1.43E-01	1.22E+00	3.59E+00	5.30E-01	9.90E-01	2.27E-01	2.70E-01			
Browse								1.99E+00	3.84E+00	1.99E+00	2.83E+00	1.99E+00	2.83E+00			
Forage																
Berries														2.42E-02	4.32E-02	5.29E-02
Lichen																
Hare	2.10E-02	2.25E-02	6.46E-02	2.25E-02	3.57E-02	2.25E-02	3.57E-02							6.08E-02	9.65E-02	1.75E-01
Moose	3.91E+00															
Caribou	3.99E-01															
Ducks		9.73E-01	2.86E+00	4.23E-01	7.90E-01	1.81E-01	2.16E-01							4.77E-01	2.08E+00	7.55E+00
Total	4.46E+00	1.17E+01	3.45E+01	5.12E+00	9.55E+00	2.20E+00	2.63E+00	3.36E+00	7.87E+00	2.59E+00	3.94E+00	2.24E+00	3.14E+00	6.55E-01	2.42E+00	8.34E+00

Pct by Pathway

Percent Intake by Pathway

Arsenic	Caribou	Hare					Moose	Sheep	Grouse					Mallard		
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S
Water	0.27%	0.16%	0.38%	0.32%	0.07%	0.12%	0.64%	2.77%	0.09%	0.30%	0.20%	0.05%	0.09%	0.02%	0.02%	0.02%
Sediment							25.54%							4.68%	4.68%	4.68%
Soil	26.30%	22.34%	57.85%	39.44%	39.41%	67.23%		7.32%	15.44%	53.38%	28.76%	31.42%	59.64%			
Fish																
Benthic														95.20%	95.20%	95.20%
Aquatic Veg							0.21%							0.09%	0.09%	0.09%
Browse	1.97%	67.51%	25.44%	55.68%	48.48%	25.93%	73.62%		81.08%	40.78%	70.55%	67.16%	39.97%			
Forage	0.13%	9.99%	16.33%	4.56%	12.03%	6.72%		89.91%								
Berries									3.38%	5.54%	0.49%	1.37%	0.30%			
Lichen	71.34%															
Hare																
Moose																
Caribou																
Ducks																
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Caribou	Hare					Moose	Sheep	Grouse					Mallard		
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S
Water	0.27%	0.02%	0.07%	0.11%	0.03%	0.02%	0.03%	1.41%	0.01%	0.03%	0.08%	0.02%	0.01%	0.00%	0.00%	0.00%
Sediment							0.57%							0.33%	0.33%	0.33%
Soil	22.27%	3.54%	2.48%	25.96%	4.30%	2.51%		22.32%	2.15%	1.48%	21.56%	2.58%	1.50%			
Fish																
Benthic														38.26%	38.26%	38.26%
Aquatic Veg							43.02%							61.40%	61.40%	61.40%
Browse	28.34%	92.59%	94.62%	53.57%	92.90%	94.30%	56.38%		97.69%	97.87%	77.30%	97.07%	97.75%			
Forage	0.24%	3.85%	2.83%	20.36%	2.78%	3.17%		76.27%								
Berries									0.16%	0.62%	1.06%	0.33%	0.74%			
Lichen	48.88%															
Hare																
Moose																
Caribou																
Ducks																
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Caribou	Hare					Moose	Sheep	Grouse					Mallard		
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S
Water	0.14%	0.11%	0.04%	0.15%	0.08%	0.11%	0.18%	0.08%	0.08%	0.03%	0.11%	0.06%	0.08%	0.02%	0.02%	0.02%
Sediment							39.13%							30.45%	30.45%	30.45%
Soil	34.77%	13.70%	25.34%	25.76%	46.88%	35.41%		4.45%	12.08%	19.65%	21.30%	40.51%	29.20%			
Fish																
Benthic														66.28%	66.28%	66.28%
Aquatic Veg							1.70%							3.25%	3.25%	3.25%
Browse	2.99%	53.44%	53.08%	45.17%	36.63%	43.76%	58.99%		81.92%	71.51%	64.91%	54.98%	62.71%			
Forage	0.44%	32.76%	21.53%	28.93%	16.40%	20.72%		95.48%								
Berries									5.91%	8.81%	13.68%	4.45%	8.01%			
Lichen	61.66%															
Hare																
Moose																
Caribou																
Ducks																
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Percent Intake by Pat

Arsenic				Merganser						Scaup						Hoary Marmot				
Pathway	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.02%	0.02%	0.02%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.45%	0.56%	1.06%	0.15%	0.24%
Sediment	4.68%	4.68%	4.68%	37.32%	37.32%	37.32%	37.32%	37.32%	37.32%	11.66%	11.66%	11.66%	11.66%	11.66%	11.66%	31.79%	42.38%	63.77%	40.66%	67.56%
Soil																				
Fish				62.47%	62.47%	62.47%	62.47%	62.47%	62.47%											
Benthic	95.20%	95.20%	95.20%							88.30%	88.30%	88.30%	88.30%	88.30%	88.30%					
Aquatic Veg	0.09%	0.09%	0.09%							0.03%	0.03%	0.03%	0.03%	0.03%	0.03%					
Browse																				
Forage																67.76%	57.06%	35.18%	59.20%	32.20%
Berries																				
Lichen																				
Hare																				
Moose																				
Caribou																				
Ducks																				
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium				Merganser						Scaup						Hoary Marmot				
Pathway	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.00%	0.00%	0.00%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.15%	0.82%	0.18%	0.33%	0.27%
Sediment	0.33%	0.33%	0.33%	6.62%	6.62%	6.62%	6.62%	6.62%	6.62%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%	16.11%	15.40%	21.06%	24.40%	14.20%
Soil																				
Fish				93.29%	93.29%	93.29%	93.29%	93.29%	93.29%											
Benthic	38.26%	38.26%	38.26%							66.51%	66.51%	66.51%	66.51%	66.51%	66.51%					
Aquatic Veg	61.40%	61.40%	61.40%							31.95%	31.95%	31.95%	31.95%	31.95%	31.95%					
Browse																				
Forage																83.74%	83.78%	78.76%	75.26%	85.53%
Berries																				
Lichen																				
Hare																				
Moose																				
Caribou																				
Ducks																				
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper				Merganser						Scaup						Hoary Marmot				
Pathway	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.13%	0.07%	0.18%	0.14%	0.17%
Sediment	30.45%	30.45%	30.45%	22.98%	22.98%	22.98%	22.98%	22.98%	22.98%	54.87%	54.87%	54.87%	54.87%	54.87%	54.87%	8.05%	19.78%	15.70%	37.42%	26.34%
Soil																				
Fish				77.00%	77.00%	77.00%	77.00%	77.00%	77.00%											
Benthic	66.28%	66.28%	66.28%							44.47%	44.47%	44.47%	44.47%	44.47%	44.47%					
Aquatic Veg	3.25%	3.25%	3.25%							0.65%	0.65%	0.65%	0.65%	0.65%	0.65%					
Browse																				
Forage																91.82%	80.15%	84.12%	62.44%	73.50%
Berries																				
Lichen																				
Hare																				
Moose																				
Caribou																				
Ducks																				
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Percent Intake by Pat

Arsenic	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.56%	0.99%	0.28%	1.38%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%	0.98%	0.63%	1.56%	1.45%	0.70%	0.68%	1.30%	1.58%	0.86%
Sediment					31.20%	31.19%	31.20%	31.20%	31.20%	31.19%	51.45%	33.13%	81.86%	76.43%	36.73%	35.73%			
Soil	42.81%	51.26%	63.19%	84.69%													28.68%	23.59%	55.29%
Fish	8.15%	14.44%	4.14%		13.82%	13.81%	13.82%	13.82%	13.82%	13.81%									
Benthic					52.45%	52.45%	52.45%	52.45%	52.45%	52.45%									
Aquatic Veg					0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	1.41%	0.91%	2.25%	2.10%	1.01%	0.98%			
Browse											46.16%	65.33%	14.34%	20.01%	61.56%	62.61%			
Forage	21.02%	23.77%	23.98%														10.61%	2.59%	4.39%
Berries	25.19%	8.96%	7.98%																
Lichen																			
Hare				0.06%	0.00%	0.01%	0.00%	0.00%	0.00%	0.01%							0.08%	0.04%	0.11%
Moose	1.66%	0.42%	0.31%	10.19%															
Caribou	0.60%	0.15%	0.11%	3.68%															
Ducks					2.30%	2.30%	2.30%	2.30%	2.30%	2.30%							59.34%	72.20%	39.35%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.30%	0.89%	0.52%	0.97%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.01%	0.02%	0.01%	0.02%	0.01%	0.01%	0.18%	0.97%	0.18%
Sediment					2.46%	2.40%	2.45%	2.50%	2.40%	2.40%	0.29%	0.35%	0.31%	0.34%	0.32%	0.28%			
Soil	34.49%	24.92%	33.53%	49.84%													6.15%	7.88%	3.47%
Fish	15.01%	44.91%	26.01%		9.17%	8.94%	9.12%	9.31%	8.95%	8.95%									
Benthic					23.62%	23.02%	23.49%	23.98%	23.05%	23.04%									
Aquatic Veg					62.33%	60.76%	62.00%	63.28%	60.82%	60.81%	73.17%	89.45%	78.91%	87.11%	82.29%	69.72%			
Browse											26.53%	10.18%	20.76%	12.53%	17.37%	29.99%			
Forage	41.29%	20.16%	25.41%														0.77%	1.40%	0.80%
Berries	6.84%	7.05%	12.23%																
Lichen																			
Hare				0.23%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							0.04%	0.09%	0.05%
Moose	1.74%	1.74%	1.94%	41.13%															
Caribou	0.33%	0.33%	0.37%	7.84%															
Ducks					2.39%	4.85%	2.91%	0.90%	4.75%	4.77%							92.86%	89.65%	95.50%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.20%	0.10%	0.18%	0.32%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.15%	0.24%	0.18%	0.16%	0.23%	0.20%	1.45%	0.63%	0.90%
Sediment					47.81%	47.81%	47.81%	47.81%	47.81%	47.81%	42.07%	69.88%	53.27%	45.70%	66.68%	58.43%			
Soil	13.33%	21.66%	38.21%	49.08%													28.50%	40.88%	56.56%
Fish	31.30%	15.35%	28.20%		42.39%	42.39%	42.39%	42.39%	42.39%	42.39%									
Benthic					8.61%	8.61%	8.61%	8.61%	8.61%	8.61%									
Aquatic Veg					0.69%	0.69%	0.69%	0.69%	0.69%	0.69%	6.10%	10.13%	7.72%	6.63%	9.67%	8.47%			
Browse											51.68%	19.75%	38.82%	47.51%	23.42%	32.90%			
Forage	35.03%	28.50%	17.51%														23.55%	37.99%	13.42%
Berries	17.52%	32.02%	14.42%																
Lichen																			
Hare				0.24%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%							0.61%	0.63%	0.48%
Moose	2.21%	1.99%	1.25%	42.30%															
Caribou	0.42%	0.38%	0.24%	8.07%															
Ducks					0.44%	0.44%	0.44%	0.44%	0.44%	0.44%							45.90%	19.87%	28.63%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Caribou	Hare					Moose	Sheep	Grouse					Mallard		
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S
Water	0.01%	0.62%	0.07%	0.02%	0.00%	0.01%	0.14%	1.04%	0.48%	0.06%	0.02%	0.00%	0.01%	0.08%	0.08%	0.08%
Sediment							18.24%							64.61%	64.61%	64.61%
Soil	32.73%	73.41%	80.06%	56.09%	78.85%	96.70%		70.07%	65.13%	80.73%	42.86%	77.96%	97.03%			
Fish																
Benthic														23.44%	23.44%	23.44%
Aquatic Veg							1.37%							11.88%	11.88%	11.88%
Browse	0.38%	21.63%	10.49%	42.72%	12.68%	1.64%	80.26%		33.35%	18.37%	56.73%	21.78%	2.85%			
Forage	0.05%	4.34%	9.39%	1.17%	8.46%	1.66%		28.89%								
Berries									1.05%	0.84%	0.39%	0.25%	0.11%			
Lichen	66.82%															
Hare																
Moose																
Caribou																
Ducks																
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Caribou	Hare					Moose	Sheep	Grouse					Mallard		
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S
Water	0.04%	0.00%	0.00%	0.01%	0.01%	0.00%	0.02%	0.01%	0.00%	0.00%	0.01%	0.01%	0.00%	0.03%	0.03%	0.03%
Sediment							1.28%							13.52%	13.52%	13.52%
Soil	23.92%	6.71%	9.29%	5.30%	6.24%	2.51%		5.72%	5.50%	7.61%	6.56%	7.31%	2.35%			
Fish																
Benthic														81.75%	81.75%	81.75%
Aquatic Veg							0.18%							4.70%	4.70%	4.70%
Browse	14.41%	65.23%	64.56%	36.84%	43.33%	58.91%	98.52%		92.93%	91.91%	79.24%	88.19%	95.84%			
Forage	1.98%	28.06%	26.14%	57.84%	50.42%	38.58%		94.27%								
Berries									1.58%	0.47%	14.19%	4.49%	1.81%			
Lichen	59.65%															
Hare																
Moose																
Caribou																
Ducks																
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Caribou	Hare					Moose	Sheep	Grouse					Mallard		
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S
Water	0.66%	0.05%	0.27%	0.31%	0.12%	0.06%	0.32%	0.53%	0.03%	0.20%	0.38%	0.08%	0.05%	0.13%	0.13%	0.13%
Sediment							24.30%							59.71%	59.71%	59.71%
Soil	38.95%	13.39%	28.34%	20.86%	18.09%	8.22%		1.66%	9.16%	23.32%	29.08%	13.26%	7.59%			
Fish																
Benthic														38.22%	38.22%	38.22%
Aquatic Veg							0.32%							1.94%	1.94%	1.94%
Browse	9.70%	75.11%	51.90%	25.83%	67.01%	53.88%	75.06%		89.26%	74.20%	62.55%	85.33%	86.41%			
Forage	0.84%	11.46%	19.49%	53.00%	14.78%	37.83%		97.81%								
Berries									1.55%	2.28%	8.00%	1.33%	5.95%			
Lichen	49.84%															
Hare																
Moose																
Caribou																
Ducks																
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead				Merganser						Scaup						Hoary Marmot				
Pathway	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.08%	0.08%	0.08%	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	1.32%	0.11%	0.08%	0.01%	0.02%
Sediment	64.61%	64.61%	64.61%	64.16%	64.16%	64.16%	64.16%	64.16%	64.16%	86.51%	86.51%	86.51%	86.51%	86.51%	86.51%	76.97%	64.06%	90.91%	66.14%	92.43%
Soil																				
Fish				35.73%	35.73%	35.73%	35.73%	35.73%	35.73%											
Benthic	23.44%	23.44%	23.44%							11.69%	11.69%	11.69%	11.69%	11.69%	11.69%					
Aquatic Veg	11.88%	11.88%	11.88%							1.77%	1.77%	1.77%	1.77%	1.77%	1.77%					
Browse																21.71%	35.84%	9.01%	33.85%	7.55%
Forage																				
Berries																				
Lichen																				
Hare																				
Moose																				
Caribou																				
Ducks																				
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese				Merganser						Scaup						Hoary Marmot				
Pathway	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.03%	0.03%	0.03%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.00%	0.01%	0.01%	0.01%	0.00%
Sediment	13.52%	13.52%	13.52%	27.19%	27.19%	27.19%	27.19%	27.19%	27.19%	30.39%	30.39%	30.39%	30.39%	30.39%	30.39%	4.77%	6.94%	1.89%	2.53%	1.35%
Soil																				
Fish				72.73%	72.73%	72.73%	72.73%	72.73%	72.73%											
Benthic	81.75%	81.75%	81.75%							68.42%	68.42%	68.42%	68.42%	68.42%	68.42%					
Aquatic Veg	4.70%	4.70%	4.70%							1.18%	1.18%	1.18%	1.18%	1.18%	1.18%					
Browse																95.23%	93.06%	98.11%	97.46%	98.65%
Forage																				
Berries																				
Lichen																				
Hare																				
Moose																				
Caribou																				
Ducks																				
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel				Merganser						Scaup						Hoary Marmot				
Pathway	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.13%	0.13%	0.13%	0.18%	0.18%	0.18%	0.18%	0.18%	0.18%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.14%	0.46%	0.23%	0.27%	0.07%
Sediment	59.71%	59.71%	59.71%	58.94%	58.94%	58.94%	58.94%	58.94%	58.94%	80.48%	80.48%	80.48%	80.48%	80.48%	80.48%	19.66%	23.27%	7.61%	20.37%	4.36%
Soil																				
Fish				40.89%	40.89%	40.89%	40.89%	40.89%	40.89%											
Benthic	38.22%	38.22%	38.22%							19.19%	19.19%	19.19%	19.19%	19.19%	19.19%					
Aquatic Veg	1.94%	1.94%	1.94%							0.29%	0.29%	0.29%	0.29%	0.29%	0.29%					
Browse																80.20%	76.28%	92.16%	79.36%	95.57%
Forage																				
Berries																				
Lichen																				
Hare																				
Moose																				
Caribou																				
Ducks																				
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.09%	0.21%	0.01%	0.05%	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%	0.44%	0.15%	0.45%	0.41%	0.44%	0.36%	4.04%	0.80%	0.04%
Sediment					82.88%	77.81%	82.90%	82.63%	82.90%	82.27%	75.70%	25.57%	77.20%	70.96%	77.10%	63.16%			
Soil	68.88%	79.27%	88.11%	95.54%													74.06%	87.51%	92.27%
Fish	17.31%	3.33%	0.18%		12.21%	11.46%	12.21%	12.17%	12.21%	12.12%									
Benthic					2.49%	2.33%	2.49%	2.48%	2.49%	2.47%									
Aquatic Veg					2.07%	1.95%	2.07%	2.07%	2.07%	2.06%	18.92%	6.39%	19.30%	17.74%	19.28%	15.79%			
Browse											4.94%	67.89%	3.06%	10.89%	3.18%	20.69%			
Forage	4.48%	15.29%	10.70%																
Berries	2.97%	1.42%	0.93%														2.01%	0.98%	0.61%
Lichen																			
Hare				2.42%	0.06%	6.18%	0.04%	0.38%	0.04%	0.80%							4.14%	7.60%	6.92%
Moose	0.87%	0.08%	0.01%	0.33%															
Caribou	4.41%	0.40%	0.05%	1.67%															
Ducks					0.16%	0.15%	0.16%	0.16%	0.16%	0.16%							15.75%	3.11%	0.16%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.01%	0.01%	0.02%	0.21%	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%	0.05%	0.01%	0.02%	0.03%	0.02%	0.02%	0.14%	0.22%	0.50%
Sediment					44.26%	44.26%	44.26%	44.26%	44.25%	44.25%	4.96%	1.13%	2.45%	2.95%	1.63%	1.82%			
Soil	15.61%	10.49%	10.22%	83.58%													67.02%	80.66%	66.88%
Fish	0.43%	0.38%	1.02%		31.33%	31.33%	31.32%	31.32%	31.32%	31.32%									
Benthic					22.13%	22.13%	22.13%	22.13%	22.13%	22.13%									
Aquatic Veg					2.09%	2.09%	2.09%	2.09%	2.09%	2.09%	2.34%	0.53%	1.16%	1.39%	0.77%	0.86%			
Browse											92.64%	98.33%	96.37%	95.62%	97.59%	97.31%			
Forage	71.79%	85.21%	80.92%																
Berries	12.02%	3.84%	7.68%														32.44%	18.57%	31.60%
Lichen																			
Hare				0.11%	0.01%	0.01%	0.02%	0.02%	0.04%	0.04%							0.15%	0.14%	0.08%
Moose	0.13%	0.07%	0.12%	15.11%															
Caribou	0.01%	0.00%	0.01%	1.00%															
Ducks					0.07%	0.07%	0.07%	0.07%	0.07%	0.07%							0.26%	0.41%	0.94%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.25%	0.82%	0.52%	1.17%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%	0.29%	0.48%	0.62%	0.67%	0.23%	0.19%	1.05%	1.85%	1.54%
Sediment					78.45%	78.46%	78.46%	78.46%	78.44%	78.42%	28.08%	46.72%	61.35%	66.20%	22.37%	18.20%			
Soil	38.54%	33.05%	41.83%	43.50%													47.35%	21.67%	36.01%
Fish	2.77%	9.18%	5.84%		14.40%	14.40%	14.40%	14.40%	14.40%	14.39%									
Benthic					4.15%	4.15%	4.15%	4.15%	4.15%	4.15%									
Aquatic Veg					0.35%	0.35%	0.35%	0.35%	0.35%	0.35%	1.24%	2.06%	2.71%	2.92%	0.99%	0.80%			
Browse											70.39%	50.74%	35.32%	30.21%	76.42%	80.81%			
Forage	36.22%	30.95%	36.72%																
Berries	17.55%	24.50%	12.54%														13.56%	10.10%	6.79%
Lichen																			
Hare				0.28%	0.03%	0.02%	0.01%	0.01%	0.04%	0.06%							0.62%	0.18%	0.35%
Moose	4.35%	1.41%	2.36%	51.22%															
Caribou	0.33%	0.11%	0.18%	3.83%															
Ducks					2.42%	2.42%	2.42%	2.42%	2.42%	2.42%							37.42%	66.19%	55.30%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Silver	Caribou	Hare					Moose	Sheep	Grouse					Mallard		
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S
Water	0.22%	0.17%	0.33%	0.17%	0.07%	0.09%	0.85%	1.76%	0.14%	0.23%	0.16%	0.05%	0.10%	0.06%	0.06%	0.06%
Sediment							3.30%							1.48%	1.48%	1.48%
Soil	28.78%	81.79%	37.27%	70.41%	63.82%	35.98%		74.82%	78.70%	29.45%	74.33%	57.01%	48.48%			
Fish																
Benthic																
Aquatic Veg							56.17%							36.61%	36.61%	36.61%
Browse	0.66%	10.85%	49.74%	8.65%	27.45%	19.74%	39.69%		18.15%	68.29%	15.87%	42.61%	46.22%	61.85%	61.85%	61.85%
Forage	0.08%	7.19%	12.65%	20.77%	8.66%	44.19%		23.43%								
Berries									3.01%	2.04%	9.64%	0.33%	5.20%			
Lichen	70.26%															
Hare																
Moose																
Caribou																
Ducks																
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Caribou	Hare					Moose	Sheep	Grouse					Mallard		
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S
Water																
Sediment																
Soil																
Fish																
Benthic																
Aquatic Veg																
Browse	0.49%	64.82%	66.90%	67.54%	17.23%	75.52%	100.00%		92.59%	94.96%	95.62%	93.51%	94.00%			
Forage	0.26%	35.18%	33.10%	32.46%	82.77%	24.48%		100.00%								
Berries									7.41%	5.04%	4.38%	6.49%	6.00%			
Lichen	99.25%															
Hare																
Moose																
Caribou																
Ducks																
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	n/a	n/a	n/a

Tin	Caribou	Hare					Moose	Sheep	Grouse					Mallard		
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S
Water																
Sediment																
Soil	16.58%	32.74%	59.17%	49.51%	56.21%	60.26%		60.77%	32.20%	47.43%	24.38%	42.70%	69.35%			
Fish																
Benthic																
Aquatic Veg																
Browse	0.45%	38.46%	37.37%	31.27%	35.50%	14.41%	100.00%		65.73%	52.05%	26.75%	46.86%	28.81%			
Forage	0.09%	28.80%	3.46%	19.21%	8.30%	25.33%		39.23%								
Berries									2.07%	0.52%	48.87%	10.44%	1.84%			
Lichen	82.88%															
Hare																
Moose																
Caribou																
Ducks																
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	n/a	n/a	n/a

Pct by Pathway

Silver	Pelly @			Merganser						Scaup						Hoary Marmot				
Pathway	Van D/S	Pelly U/S	Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%	0.29%	0.69%	0.21%	0.13%	0.07%
Sediment	1.48%	1.48%	1.48%	1.02%	1.02%	1.02%	1.02%	1.02%	1.02%	6.72%	6.72%	6.72%	6.72%	6.72%	6.72%	70.25%	37.92%	41.46%	60.63%	14.57%
Soil																				
Fish				98.92%	98.92%	98.92%	98.92%	98.92%	98.92%											
Benthic	36.61%	36.61%	36.61%							61.91%	61.91%	61.91%	61.91%	61.91%	61.91%					
Aquatic Veg	61.85%	61.85%	61.85%							31.30%	31.30%	31.30%	31.30%	31.30%	31.30%					
Browse																				
Forage																29.46%	61.39%	58.33%	39.24%	85.36%
Berries																				
Lichen																				
Hare																				
Moose																				
Caribou																				
Ducks																				
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Pelly @			Merganser						Scaup						Hoary Marmot				
Pathway	Van D/S	Pelly U/S	Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water																				
Sediment																				
Soil																				
Fish																				
Benthic																				
Aquatic Veg																				
Browse																				
Forage																100.00%	100.00%	100.00%	100.00%	100.00%
Berries																				
Lichen																				
Hare																				
Moose																				
Caribou																				
Ducks																				
Total	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100.00%	100.00%	100.00%	100.00%	100.00%

Tin	Pelly @			Merganser						Scaup						Hoary Marmot				
Pathway	Van D/S	Pelly U/S	Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water																				
Sediment																19.25%	78.18%	35.08%	58.69%	33.28%
Soil																				
Fish																				
Benthic																				
Aquatic Veg																				
Browse																				
Forage																80.75%	21.82%	64.92%	41.31%	66.72%
Berries																				
Lichen																				
Hare																				
Moose																				
Caribou																				
Ducks																				
Total	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Silver	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.25%	0.59%	0.18%	1.04%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%	0.32%	0.28%	0.34%	0.31%	0.32%	0.03%	0.85%	1.85%	0.65%
Sediment					2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	1.65%	1.41%	1.71%	1.59%	1.65%	0.14%	65.43%	32.21%	76.11%
Soil	65.71%	35.56%	73.12%	85.13%															
Fish	20.10%	47.99%	14.55%		73.21%	73.20%	73.21%	73.21%	73.21%	73.02%									
Benthic					5.86%	5.86%	5.86%	5.86%	5.86%	5.84%									
Aquatic Veg					16.28%	16.27%	16.28%	16.28%	16.28%	16.23%	93.67%	80.39%	97.38%	90.49%	93.67%	8.24%			
Browse											4.36%	17.92%	0.57%	7.60%	4.36%	91.59%			
Forage	6.35%	11.86%	10.28%														4.23%	1.99%	0.85%
Berries	6.75%	3.49%	1.30%																
Lichen																			
Hare				0.06%	0.00%	0.01%	0.00%	0.00%	0.00%	0.25%							0.07%	0.08%	0.13%
Moose	0.53%	0.32%	0.36%	8.70%															
Caribou	0.31%	0.19%	0.21%	5.07%															
Ducks					1.65%	1.65%	1.65%	1.65%	1.65%	1.64%							29.42%	63.88%	22.26%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water																			
Sediment																			
Soil																			
Fish																			
Benthic																			
Aquatic Veg																			
Browse											100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			
Forage	51.82%	56.71%	90.84%														94.54%	95.94%	78.31%
Berries	32.46%	33.91%	6.25%																
Lichen																			
Hare				0.44%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%							5.46%	4.06%	21.69%
Moose	5.29%	3.15%	0.98%	33.46%															
Caribou	10.44%	6.23%	1.93%	66.09%															
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Tin	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water																			
Sediment																			
Soil	43.94%	76.27%	63.96%	39.65%													88.09%	92.57%	82.91%
Fish																			
Benthic																			
Aquatic Veg																			
Browse											100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			
Forage	42.47%	11.60%	10.35%														9.54%	5.29%	15.95%
Berries	7.57%	6.93%	19.57%																
Lichen																			
Hare				0.39%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%							2.37%	2.14%	1.14%
Moose	1.90%	1.65%	1.93%	18.97%															
Caribou	4.11%	3.56%	4.18%	40.99%															
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Caribou	Hare					Moose	Sheep	Grouse					Mallard		
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S
Water	0.06%	0.01%	0.01%	0.10%	0.03%	0.04%	0.04%	0.10%	0.00%	0.02%	0.06%	0.02%	0.02%	0.01%	0.01%	0.01%
Sediment							1.50%							2.27%	2.27%	2.27%
Soil	18.95%	4.45%	7.89%	8.06%	11.97%	9.59%		15.47%	2.89%	11.07%	5.73%	8.18%	6.24%			
Fish																
Benthic																
Aquatic Veg							3.70%							83.99%	83.99%	83.99%
Browse	8.96%	85.70%	36.10%	75.80%	77.01%	82.43%	94.76%		96.66%	87.96%	93.71%	91.38%	93.18%	13.73%	13.73%	13.73%
Forage	0.44%	9.85%	56.00%	16.05%	10.98%	7.94%										
Berries								84.43%								
Lichen	71.59%								0.45%	0.96%	0.50%	0.43%	0.56%			
Hare																
Moose																
Caribou																
Ducks																
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Pelly @			Merganser						Scaup						Hoary Marmot				
Pathway	Van D/S	Pelly U/S	Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.01%	0.01%	0.01%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.02%	0.01%	0.24%	0.09%	0.17%
Sediment	2.27%	2.27%	2.27%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	6.47%	6.47%	6.47%	6.47%	6.47%	6.47%					
Soil																8.65%	2.87%	9.50%	18.59%	20.18%
Fish				97.08%	97.08%	97.08%	97.08%	97.08%	97.08%											
Benthic	83.99%	83.99%	83.99%							89.16%	89.16%	89.16%	89.16%	89.16%	89.16%					
Aquatic Veg	13.73%	13.73%	13.73%							4.36%	4.36%	4.36%	4.36%	4.36%	4.36%					
Browse																				
Forage																91.33%	97.12%	90.26%	81.32%	79.65%
Berries																				
Lichen																				
Hare																				
Moose																				
Caribou																				
Ducks																				
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.02%	0.03%	0.12%	0.02%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.10%	0.12%	0.05%	0.07%	0.03%	0.02%	0.11%	0.13%	0.14%
Sediment					6.66%	6.66%	6.65%	6.65%	6.61%	6.59%	4.41%	5.54%	2.49%	3.05%	1.23%	1.05%			
Soil	8.75%	6.52%	20.38%	2.97%													14.09%	7.82%	6.53%
Fish	4.92%	7.82%	30.76%		58.94%	58.94%	58.79%	58.83%	58.45%	58.25%									
Benthic					20.40%	20.40%	20.35%	20.36%	20.23%	20.16%									
Aquatic Veg					5.48%	5.48%	5.47%	5.47%	5.44%	5.42%	36.28%	45.56%	20.50%	25.09%	10.10%	8.62%			
Browse											59.21%	48.78%	76.95%	71.79%	88.65%	90.31%			
Forage	21.28%	60.92%	21.34%														3.69%	1.79%	0.63%
Berries	3.65%	2.37%	3.15%																
Lichen																			
Hare				0.47%	0.19%	0.19%	0.44%	0.37%	1.02%	1.36%							9.29%	4.00%	2.09%
Moose	55.69%	20.27%	21.99%	87.59%															
Caribou	5.69%	2.07%	2.25%	8.95%															
Ducks					8.29%	8.29%	8.27%	8.27%	8.22%	8.19%							72.83%	86.26%	90.60%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

APPENDIX F-5

REMEDIATION FUTURE 3 SCENARIO

(SUMMARY TERRESTRIAL ECOLOGICAL RECEPTOR RESULTS)

by Pathway

Intake by Pathway (mg/kg d)

Arsenic	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.48E-04	5.35E-05	3.71E-04	7.28E-04	7.28E-04	7.28E-04	1.71E-04	3.06E-04	4.35E-05	3.01E-04	5.91E-04	5.91E-04	5.91E-04	3.09E-05	2.25E-04	1.58E-04	1.15E-04	1.66E-05	1.81E-05
Sediment							6.85E-03							7.71E-03	5.61E-02	3.95E-02	2.86E-02	4.13E-03	4.53E-03
Soil	9.88E-03	7.64E-03	5.69E-02	1.77E-02	8.22E-02	8.27E-02		8.07E-04	7.11E-03	5.29E-02	1.65E-02	7.65E-02	7.69E-02						
Fish																			
Benthic														1.57E-01	1.14E+00	8.03E-01	5.82E-01	8.40E-02	9.20E-02
Aquatic Veg							5.65E-05							1.56E-04	1.13E-03	7.98E-04	5.79E-04	8.34E-05	9.14E-05
Browse	7.40E-04	2.31E-02	2.50E-02	2.50E-02	1.01E-01	3.19E-02	1.34E-02		3.73E-02	4.04E-02	4.04E-02	1.64E-01	5.16E-02						
Forage	4.76E-05	3.41E-03	1.61E-02	2.05E-03	2.51E-02	8.26E-03		9.92E-03											
Berries									1.56E-03	5.49E-03	2.79E-04	3.33E-03	3.88E-04						
Lichen	2.68E-02																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	3.76E-02	3.42E-02	9.83E-02	4.55E-02	2.09E-01	1.24E-01	2.05E-02	1.10E-02	4.60E-02	9.92E-02	5.78E-02	2.44E-01	1.29E-01	1.65E-01	1.20E+00	8.44E-01	6.12E-01	8.82E-02	9.66E-02

Cadmium	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	4.80E-05	4.64E-05	1.74E-04	2.59E-04	2.59E-04	2.59E-04	5.54E-05	7.32E-05	3.77E-05	1.41E-04	2.10E-04	2.10E-04	2.10E-04	8.35E-06	8.01E-05	1.15E-05	5.39E-05	1.44E-05	1.47E-05
Sediment							9.16E-04							8.59E-04	8.23E-03	1.18E-03	5.54E-03	1.48E-03	1.51E-03
Soil	2.46E-03	1.00E-02	5.30E-03	1.75E-02	1.08E-02	7.79E-03		9.69E-04	9.35E-03	4.93E-03	1.62E-02	1.00E-02	7.25E-03						
Fish																			
Benthic														9.97E-02	9.56E-01	1.37E-01	6.43E-01	1.71E-01	1.76E-01
Aquatic Veg							6.96E-02							1.60E-01	1.53E+00	2.20E-01	1.03E+00	2.75E-01	2.82E-01
Browse	3.14E-03	2.63E-01	2.02E-01	3.60E-02	2.33E-01	2.93E-01	5.68E-02		4.25E-01	3.26E-01	5.82E-02	3.77E-01	4.74E-01						
Forage	2.66E-05	1.09E-02	6.05E-03	1.37E-02	6.97E-03	9.84E-03		3.31E-03											
Berries									6.90E-04	2.07E-03	7.99E-04	1.28E-03	3.59E-03						
Lichen	5.41E-03																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	1.11E-02	2.84E-01	2.13E-01	6.74E-02	2.51E-01	3.11E-01	1.27E-01	4.35E-03	4.35E-01	3.34E-01	7.55E-02	3.88E-01	4.85E-01	2.61E-01	2.50E+00	3.59E-01	1.68E+00	4.48E-01	4.59E-01

Copper	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	5.61E-04	4.63E-04	9.46E-04	4.66E-03	4.66E-03	4.66E-03	6.47E-04	4.05E-04	3.76E-04	7.68E-04	3.78E-03	3.78E-03	3.78E-03	4.09E-05	1.44E-03	6.89E-05	2.92E-04	1.43E-04	1.52E-04
Sediment							1.43E-01							5.61E-02	1.97E+00	9.45E-02	4.01E-01	1.96E-01	2.08E-01
Soil	4.54E-02	5.89E-02	1.43E-01	1.29E-01	4.06E-01	2.34E-01		9.69E-03	5.48E-02	1.33E-01	1.20E-01	3.78E-01	2.18E-01						
Fish																			
Benthic														1.22E-01	4.30E+00	2.06E-01	8.73E-01	4.27E-01	4.53E-01
Aquatic Veg							6.21E-03							5.98E-03	2.10E-01	1.01E-02	4.27E-02	2.09E-02	2.22E-02
Browse	3.90E-03	2.30E-01	2.99E-01	2.27E-01	3.17E-01	2.89E-01	7.07E-02		3.71E-01	4.83E-01	3.66E-01	5.13E-01	4.68E-01						
Forage	5.77E-04	1.41E-01	1.21E-01	1.45E-01	1.42E-01	1.37E-01		2.08E-01											
Berries									2.68E-02	5.95E-02	7.72E-02	4.15E-02	5.98E-02						
Lichen	8.05E-02																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	1.31E-01	4.30E-01	5.63E-01	5.06E-01	8.70E-01	6.65E-01	2.20E-01	2.18E-01	4.53E-01	6.76E-01	5.68E-01	9.36E-01	7.50E-01	1.84E-01	6.48E+00	3.10E-01	1.32E+00	6.44E-01	6.83E-01

by Pathway

Intake by Pathway (n

Pathway	Merganser						Scaup						Hoary Marmot					Bear	
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	2.78E-05	2.03E-04	1.43E-04	1.03E-04	1.49E-05	1.63E-05	3.41E-05	2.48E-04	1.75E-04	1.27E-04	1.83E-05	2.00E-05	4.87E-05	3.38E-04	6.62E-04	6.62E-04	6.62E-04	3.42E-05	2.37E-04
Sediment	5.00E-03	3.64E-02	2.56E-02	1.86E-02	2.68E-03	2.93E-03	3.35E-02	2.43E-01	1.71E-01	1.24E-01	1.79E-02	1.96E-02							
Soil													3.42E-03	2.55E-02	7.93E-03	3.68E-02	3.70E-02	2.61E-03	1.23E-02
Fish	8.37E-03	6.09E-02	4.29E-02	3.11E-02	4.48E-03	4.91E-03												4.98E-04	3.45E-03
Benthic							2.53E-01	1.84E+00	1.30E+00	9.41E-01	1.36E-01	1.49E-01							
Aquatic Veg							7.54E-05	5.48E-04	3.86E-04	2.80E-04	4.03E-05	4.42E-05							
Browse																			
Forage																			
Berries													7.28E-03	3.43E-02	4.37E-03	5.36E-02	1.76E-02	1.28E-03	5.69E-03
Lichen																		1.54E-03	2.14E-03
Hare																			
Moose																		1.14E-04	1.14E-04
Caribou																		3.67E-05	3.67E-05
Ducks																			
Total	1.34E-02	9.75E-02	6.86E-02	4.98E-02	7.17E-03	7.86E-03	2.87E-01	2.09E+00	1.47E+00	1.07E+00	1.54E-01	1.68E-01	1.08E-02	6.01E-02	1.30E-02	9.10E-02	5.53E-02	6.12E-03	2.39E-02

Pathway	Merganser						Scaup						Hoary Marmot					Bear	
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	7.52E-06	7.21E-05	1.04E-05	4.85E-05	1.29E-05	1.32E-05	9.23E-06	8.84E-05	1.27E-05	5.95E-05	1.59E-05	1.63E-05	4.22E-05	1.58E-04	2.36E-04	2.36E-04	2.36E-04	2.97E-05	1.11E-04
Sediment	5.57E-04	5.34E-03	7.67E-04	3.59E-03	9.57E-04	9.81E-04	3.73E-03	3.57E-02	5.13E-03	2.40E-02	6.40E-03	6.56E-03							
Soil													4.50E-03	2.37E-03	7.81E-03	4.82E-03	3.49E-03	3.44E-03	2.49E-03
Fish	7.84E-03	7.52E-02	1.08E-02	5.06E-02	1.35E-02	1.38E-02												1.50E-03	5.62E-03
Benthic							1.61E-01	1.54E+00	2.22E-01	1.04E+00	2.77E-01	2.84E-01							
Aquatic Veg							7.74E-02	7.42E-01	1.07E-01	4.99E-01	1.33E-01	1.36E-01							
Browse																			
Forage																			
Berries																			
Lichen																			
Hare																			
Moose																			
Caribou																		3.19E-04	3.19E-04
Ducks																		3.32E-05	3.32E-05
Total	8.41E-03	8.06E-02	1.16E-02	5.42E-02	1.44E-02	1.48E-02	2.42E-01	2.32E+00	3.34E-01	1.56E+00	4.16E-01	4.27E-01	2.79E-02	1.54E-02	3.73E-02	1.99E-02	2.47E-02	1.01E-02	1.13E-02

Pathway	Merganser						Scaup						Hoary Marmot					Bear	
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	3.68E-05	1.30E-03	6.21E-05	2.63E-04	1.29E-04	1.37E-04	4.52E-05	1.59E-03	7.62E-05	3.23E-04	1.58E-04	1.68E-04	4.21E-04	8.60E-04	4.23E-03	4.23E-03	4.23E-03	2.96E-04	6.05E-04
Sediment	3.64E-02	1.28E+00	6.13E-02	2.60E-01	1.27E-01	1.35E-01	2.43E-01	8.56E+00	4.10E-01	1.74E+00	8.51E-01	9.03E-01							
Soil													2.63E-02	6.38E-02	5.78E-02	1.82E-01	1.05E-01	2.01E-02	3.64E-02
Fish	1.22E-01	4.29E+00	2.05E-01	8.71E-01	4.26E-01	4.52E-01												4.73E-02	9.67E-02
Benthic							1.97E-01	6.94E+00	3.32E-01	1.41E+00	6.90E-01	7.32E-01							
Aquatic Veg							2.89E-03	1.02E-01	4.87E-03	2.07E-02	1.01E-02	1.07E-02							
Browse																			
Forage																			
Berries																			
Lichen																			
Hare																			
Moose																			
Caribou																		6.13E-03	6.13E-03
Ducks																		6.38E-04	6.38E-04
Total	1.58E-01	5.57E+00	2.67E-01	1.13E+00	5.53E-01	5.87E-01	4.43E-01	1.56E+01	7.47E-01	3.17E+00	1.55E+00	1.65E+00	3.27E-01	3.23E-01	3.72E-01	4.89E-01	4.02E-01	1.54E-01	2.42E-01

by Pathway

Intake by Pathway (n

Arsenic		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	4.65E-04	5.56E-05	1.07E-04	7.76E-04	5.46E-04	3.96E-04	5.71E-05	6.26E-05	7.76E-05	5.65E-04	3.98E-04	2.88E-04	4.16E-05	4.55E-05	4.91E-05	3.40E-04	6.67E-04
Sediment			2.16E-02	1.57E-01	1.10E-01	8.01E-02	1.15E-02	1.27E-02	4.08E-03	2.97E-02	2.09E-02	1.52E-02	2.19E-03	2.40E-03	1.08E-03	5.08E-03	8.51E-03
Soil	2.05E-02	2.32E-03															
Fish	6.76E-03		9.55E-03	6.95E-02	4.89E-02	3.55E-02	5.11E-03	5.60E-03									
Benthic			3.63E-02	2.64E-01	1.86E-01	1.35E-01	1.94E-02	2.13E-02									
Aquatic Veg			5.92E-05	4.31E-04	3.03E-04	2.20E-04	3.17E-05	3.48E-05	1.12E-04	8.16E-04	5.75E-04	4.17E-04	6.01E-05	6.58E-05			
Browse									3.66E-03	1.16E-02	3.66E-03	3.97E-03	3.66E-03	3.97E-03			
Forage	7.79E-03																
Berries	2.59E-03														4.01E-04	5.58E-04	6.75E-04
Lichen																	
Hare		1.74E-06	1.05E-06	6.44E-06	1.05E-06	3.03E-06	1.05E-06	3.03E-06							2.84E-06	8.18E-06	1.74E-05
Moose	1.14E-04	3.14E-04															
Caribou	3.67E-05	1.01E-04															
Ducks			1.59E-03	1.15E-02	8.13E-03	5.89E-03	8.50E-04	9.31E-04							2.24E-03	1.56E-02	3.05E-02
Total	3.83E-02	2.79E-03	6.91E-02	5.03E-01	3.54E-01	2.57E-01	3.70E-02	4.06E-02	7.94E-03	4.27E-02	2.56E-02	1.98E-02	5.95E-03	6.48E-03	3.78E-03	2.15E-02	4.03E-02

Cadmium		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.66E-04	1.80E-05	2.88E-05	2.76E-04	3.97E-05	1.86E-04	4.95E-05	5.07E-05	2.10E-05	2.01E-04	2.89E-05	1.35E-04	3.60E-05	3.69E-05	4.26E-05	1.60E-04	2.37E-04
Sediment			2.40E-03	2.30E-02	3.31E-03	1.55E-02	4.13E-03	4.23E-03	4.55E-04	4.36E-03	6.27E-04	2.93E-03	7.81E-04	8.01E-04	1.43E-03	1.03E-03	1.24E-03
Soil	3.00E-03	5.79E-04															
Fish	8.35E-03		8.95E-03	8.58E-02	1.23E-02	5.77E-02	1.54E-02	1.58E-02									
Benthic			2.30E-02	2.21E-01	3.18E-02	1.49E-01	3.96E-02	4.06E-02									
Aquatic Veg			6.08E-02	5.83E-01	8.38E-02	3.92E-01	1.05E-01	1.07E-01	1.15E-01	1.10E+00	1.59E-01	7.43E-01	1.98E-01	2.03E-01			
Browse									4.18E-02	3.50E-02	4.18E-02	8.53E-02	4.18E-02	8.53E-02			
Forage	2.27E-03																
Berries	1.09E-03														1.78E-04	1.84E-04	2.85E-04
Lichen																	
Hare		2.68E-06	3.44E-06	6.97E-06	3.44E-06	4.51E-06	3.44E-06	4.51E-06							9.30E-06	1.22E-05	1.88E-05
Moose	3.19E-04	8.79E-04															
Caribou	3.32E-05	9.14E-05															
Ducks			2.33E-03	8.21E-02	3.93E-03	1.67E-02	8.16E-03	8.65E-03							2.15E-02	4.40E-02	2.17E-01
Total	1.52E-02	1.57E-03	9.76E-02	9.95E-01	1.35E-01	6.31E-01	1.72E-01	1.76E-01	1.57E-01	1.14E+00	2.01E-01	8.31E-01	2.41E-01	2.89E-01	2.32E-02	4.54E-02	2.18E-01

Copper		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	2.98E-03	2.11E-04	1.41E-04	4.96E-03	2.38E-04	1.01E-03	4.93E-04	5.23E-04	1.03E-04	3.61E-03	1.73E-04	7.34E-04	3.59E-04	3.81E-04	4.24E-04	8.67E-04	4.27E-03
Sediment			1.57E-01	5.52E+00	2.64E-01	1.12E+00	5.48E-01	5.82E-01	2.97E-02	1.04E+00	5.00E-02	2.12E-01	1.04E-01	1.10E-01	8.35E-03	1.51E-02	4.22E-02
Soil	1.02E-01	1.07E-02															
Fish	4.76E-01		1.39E-01	4.89E+00	2.34E-01	9.94E-01	4.86E-01	5.16E-01									
Benthic			2.82E-02	9.93E-01	4.76E-02	2.02E-01	9.87E-02	1.05E-01									
Aquatic Veg			2.27E-03	8.00E-02	3.83E-03	1.63E-02	7.95E-03	8.43E-03	4.30E-03	1.51E-01	7.26E-03	3.08E-02	1.51E-02	1.60E-02			
Browse									3.65E-02	4.66E-02	3.65E-02	5.88E-02	3.65E-02	5.88E-02			
Forage	4.67E-02																
Berries	3.84E-02														6.90E-03	1.40E-02	1.00E-02
Lichen																	
Hare		5.16E-05	6.62E-05	1.34E-04	6.62E-05	8.67E-05	6.62E-05	8.67E-05							1.79E-04	2.34E-04	3.62E-04
Moose	6.13E-03	1.69E-02															
Caribou	6.38E-04	1.76E-03															
Ducks			1.46E-03	5.13E-02	2.46E-03	1.04E-02	5.10E-03	5.41E-03							1.35E-02	2.75E-02	1.35E-01
Total	6.73E-01	2.96E-02	3.28E-01	1.15E+01	5.53E-01	2.34E+00	1.15E+00	1.22E+00	7.06E-02	1.25E+00	9.39E-02	3.03E-01	1.56E-01	1.85E-01	2.93E-02	5.77E-02	1.92E-01

by Pathway

Lead	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	2.23E-04	3.96E-04	8.50E-04	4.43E-04	4.43E-04	4.43E-04	2.57E-04	4.37E-04	3.21E-04	6.90E-04	3.59E-04	3.59E-04	3.59E-04	7.72E-05	1.37E-04	1.27E-04	2.63E-04	1.22E-04	1.22E-04
Sediment							3.40E-02							6.35E-02	1.13E-01	1.05E-01	2.16E-01	1.01E-01	1.00E-01
Soil	6.91E-01	4.69E-02	1.01E+00	9.32E-01	8.20E+00	3.73E+00		2.91E-02	4.37E-02	9.38E-01	8.68E-01	7.63E+00	3.47E+00						
Fish																			
Benthic														2.30E-02	4.08E-02	3.80E-02	7.84E-02	3.65E-02	3.63E-02
Aquatic Veg							2.55E-03							1.17E-02	2.07E-02	1.93E-02	3.97E-02	1.85E-02	1.84E-02
Browse	8.09E-03	1.38E-02	1.32E-01	7.10E-01	1.32E+00	6.31E-02	1.46E-01		2.24E-02	2.13E-01	1.15E+00	2.13E+00	1.02E-01						
Forage	1.04E-03	2.77E-03	1.18E-01	1.94E-02	8.80E-01	6.39E-02		1.20E-02											
Berries									7.02E-04	9.71E-03	7.98E-03	2.46E-02	3.96E-03						
Lichen	1.41E+00																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	2.11E+00	6.39E-02	1.26E+00	1.66E+00	1.04E+01	3.86E+00	1.83E-01	4.15E-02	6.70E-02	1.16E+00	2.02E+00	9.79E+00	3.58E+00	9.83E-02	1.74E-01	1.62E-01	3.34E-01	1.56E-01	1.55E-01

Manganese	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	3.57E-03	1.30E-03	1.35E-02	2.16E-02	2.16E-02	2.16E-02	4.12E-03	5.35E-03	1.06E-03	1.09E-02	1.76E-02	1.76E-02	1.76E-02	1.29E-03	6.69E-03	6.12E-04	4.17E-03	4.02E-04	4.49E-04
Sediment							3.27E-01							6.37E-01	3.30E+00	3.02E-01	2.06E+00	1.98E-01	2.22E-01
Soil	7.58E-01	4.07E+00	5.63E+00	1.67E+00	1.49E+00	2.18E+00		1.07E+00	3.79E+00	5.24E+00	1.56E+00	1.39E+00	2.03E+00						
Fish																			
Benthic														3.85E+00	2.00E+01	1.83E+00	1.24E+01	1.20E+00	1.34E+00
Aquatic Veg							4.63E-02							2.21E-01	1.15E+00	1.05E-01	7.14E-01	6.89E-02	7.70E-02
Browse	4.57E-01	3.96E+01	3.91E+01	1.16E+01	1.04E+01	5.10E+01	8.27E+00		6.41E+01	6.33E+01	1.88E+01	1.68E+01	8.24E+01						
Forage	6.27E-02	1.70E+01	1.59E+01	1.83E+01	1.21E+01	3.34E+01		1.77E+01											
Berries									1.09E+00	3.26E-01	3.37E+00	8.54E-01	1.55E+00						
Lichen	1.89E+00																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	3.17E+00	6.08E+01	6.06E+01	3.16E+01	2.40E+01	8.66E+01	8.65E+00	1.88E+01	6.90E+01	6.89E+01	2.38E+01	1.90E+01	8.60E+01	4.71E+00	2.44E+01	2.23E+00	1.52E+01	1.47E+00	1.64E+00

Nickel	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.99E-04	9.29E-05	1.06E-03	5.24E-04	5.24E-04	5.24E-04	2.30E-04	5.57E-04	7.54E-05	8.59E-04	4.25E-04	4.25E-04	4.25E-04	3.91E-05	1.62E-04	1.70E-04	3.27E-04	2.87E-05	3.05E-05
Sediment							1.72E-02							1.82E-02	7.54E-02	7.94E-02	1.53E-01	1.34E-02	1.42E-02
Soil	1.05E-02	2.72E-02	9.78E-02	2.42E-02	5.45E-02	4.66E-02		1.61E-03	2.53E-02	9.11E-02	2.26E-02	5.07E-02	4.34E-02						
Fish																			
Benthic														1.17E-02	4.83E-02	5.08E-02	9.77E-02	8.56E-03	9.09E-03
Aquatic Veg							2.28E-04							5.92E-04	2.45E-03	2.58E-03	4.95E-03	4.34E-04	4.61E-04
Browse	2.61E-03	1.52E-01	1.79E-01	3.00E-02	2.02E-01	3.05E-01	4.72E-02		2.46E-01	2.90E-01	4.85E-02	3.26E-01	4.94E-01						
Forage	2.27E-04	2.32E-02	6.73E-02	6.16E-02	4.45E-02	2.14E-01		9.51E-02											
Berries									4.29E-03	8.91E-03	6.20E-03	5.09E-03	3.40E-02						
Lichen	1.34E-02																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	2.69E-02	2.03E-01	3.45E-01	1.16E-01	3.01E-01	5.67E-01	6.49E-02	9.73E-02	2.76E-01	3.91E-01	7.77E-02	3.83E-01	5.72E-01	3.05E-02	1.26E-01	1.33E-01	2.56E-01	2.24E-02	2.38E-02

by Pathway

Lead	Merganser						Scaup						Hoary Marmot					Bear	
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	6.95E-05	1.23E-04	1.15E-04	2.37E-04	1.10E-04	1.10E-04	8.53E-05	1.51E-04	1.41E-04	2.90E-04	1.35E-04	1.34E-04	3.60E-04	7.73E-04	4.03E-04	4.03E-04	4.03E-04	2.53E-04	5.43E-04
Sediment	4.12E-02	7.30E-02	6.79E-02	1.40E-01	6.52E-02	6.49E-02	2.75E-01	4.89E-01	4.54E-01	9.37E-01	4.37E-01	4.34E-01							
Soil													2.10E-02	4.51E-01	4.17E-01	3.67E+00	1.67E+00	1.61E-02	2.04E-01
Fish	2.29E-02	4.07E-02	3.78E-02	7.80E-02	3.63E-02	3.61E-02												4.04E-03	8.66E-03
Benthic							3.72E-02	6.60E-02	6.14E-02	1.27E-01	5.90E-02	5.87E-02							
Aquatic Veg							5.64E-03	1.00E-02	9.31E-03	1.92E-02	8.95E-03	8.90E-03							
Browse																			
Forage													5.92E-03	2.52E-01	4.13E-02	1.88E+00	1.36E-01	1.04E-03	3.93E-02
Berries																		6.93E-04	3.65E-03
Lichen																			
Hare																			
Moose																		2.04E-04	2.04E-04
Caribou																		1.03E-03	1.03E-03
Ducks																			
Total	6.41E-02	1.14E-01	1.06E-01	2.18E-01	1.02E-01	1.01E-01	3.18E-01	5.65E-01	5.25E-01	1.08E+00	5.05E-01	5.02E-01	2.73E-02	7.04E-01	4.59E-01	5.55E+00	1.81E+00	2.33E-02	2.57E-01

Manganese	Merganser						Scaup						Hoary Marmot					Bear	
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	1.16E-03	6.02E-03	5.51E-04	3.75E-03	3.62E-04	4.05E-04	1.43E-03	7.39E-03	6.76E-04	4.60E-03	4.44E-04	4.96E-04	1.18E-03	1.23E-02	1.97E-02	1.97E-02	1.97E-02	8.31E-04	8.62E-03
Sediment	4.13E-01	2.14E+00	1.96E-01	1.33E+00	1.29E-01	1.44E-01	2.76E+00	1.43E+01	1.31E+00	8.92E+00	8.60E-01	9.62E-01							
Soil													1.82E+00	2.52E+00	7.49E-01	6.69E-01	9.74E-01	1.39E+00	1.80E+00
Fish	1.10E+00	5.72E+00	5.24E-01	3.57E+00	3.44E-01	3.85E-01												3.82E-02	3.96E-01
Benthic							6.22E+00	3.22E+01	2.95E+00	2.01E+01	1.94E+00	2.17E+00							
Aquatic Veg							1.07E-01	5.54E-01	5.07E-02	3.45E-01	3.33E-02	3.72E-02							
Browse																			
Forage													3.64E+01	3.38E+01	3.90E+01	2.58E+01	7.13E+01	6.41E+00	1.46E+01
Berries																		1.07E+00	6.59E-01
Lichen																			
Hare																			
Moose																		1.20E-02	1.20E-02
Caribou																		7.73E-04	7.73E-04
Ducks																			
Total	1.52E+00	7.87E+00	7.20E-01	4.90E+00	4.73E-01	5.29E-01	9.09E+00	4.71E+01	4.31E+00	2.94E+01	2.83E+00	3.17E+00	3.82E+01	3.64E+01	3.97E+01	2.65E+01	7.23E+01	8.93E+00	1.75E+01

Nickel	Merganser						Scaup						Hoary Marmot					Bear	
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	3.52E-05	1.46E-04	1.53E-04	2.95E-04	2.59E-05	2.74E-05	4.32E-05	1.79E-04	1.88E-04	3.62E-04	3.17E-05	3.37E-05	8.44E-05	9.63E-04	4.76E-04	4.76E-04	4.76E-04	5.94E-05	6.77E-04
Sediment	1.18E-02	4.89E-02	5.15E-02	9.89E-02	8.67E-03	9.21E-03	7.91E-02	3.27E-01	3.44E-01	6.62E-01	5.80E-02	6.16E-02							
Soil													1.22E-02	4.38E-02	1.08E-02	2.44E-02	2.09E-02	9.30E-03	2.46E-02
Fish	8.20E-03	3.39E-02	3.57E-02	6.86E-02	6.02E-03	6.39E-03												6.68E-04	7.62E-03
Benthic							1.89E-02	7.80E-02	8.21E-02	1.58E-01	1.38E-02	1.47E-02							
Aquatic Veg							2.86E-04	1.18E-03	1.25E-03	2.39E-03	2.10E-04	2.23E-04							
Browse																			
Forage													4.96E-02	1.44E-01	1.31E-01	9.50E-02	4.58E-01	8.74E-03	2.30E-02
Berries																		4.24E-03	1.82E-02
Lichen																			
Hare																			
Moose																		1.08E-03	1.08E-03
Caribou																		7.86E-05	7.86E-05
Ducks																			
Total	2.01E-02	8.30E-02	8.73E-02	1.68E-01	1.47E-02	1.56E-02	9.83E-02	4.07E-01	4.28E-01	8.22E-01	7.21E-02	7.66E-02	6.19E-02	1.88E-01	1.43E-01	1.20E-01	4.79E-01	2.42E-02	7.53E-02

by Pathway

Lead		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	2.83E-04	8.36E-05	2.66E-04	4.72E-04	4.39E-04	9.06E-04	4.22E-04	4.20E-04	1.94E-04	3.44E-04	3.20E-04	6.60E-04	3.07E-04	3.06E-04	3.63E-04	7.79E-04	4.06E-04
Sediment			1.77E-01	3.15E-01	2.93E-01	6.04E-01	2.81E-01	2.80E-01	3.36E-02	5.96E-02	5.55E-02	1.14E-01	5.33E-02	5.30E-02	6.66E-03	8.45E-02	8.08E-01
Soil	1.95E+00	1.62E-01															
Fish	4.52E-03		2.61E-02	4.64E-02	4.31E-02	8.90E-02	4.14E-02	4.12E-02									
Benthic			5.32E-03	9.44E-03	8.78E-03	1.81E-02	8.44E-03	8.39E-03									
Aquatic Veg			4.44E-03	7.87E-03	7.32E-03	1.51E-02	7.03E-03	7.00E-03									
Browse									8.40E-03	1.49E-02	1.39E-02	2.86E-02	1.33E-02	1.32E-02			
Forage	2.37E-01								2.19E-03	1.42E-01	2.19E-03	1.73E-02	2.19E-03	1.73E-02			
Berries	2.06E-02														1.81E-04	9.50E-04	5.38E-03
Lichen																	
Hare		4.11E-03	1.38E-04	2.24E-02	1.38E-04	2.71E-03	1.38E-04	2.71E-03							3.72E-04	7.33E-03	6.05E-02
Moose	2.04E-04	5.63E-04															
Caribou	1.03E-03	2.83E-03															
Ducks			3.38E-04	6.00E-04	5.58E-04	1.15E-03	5.36E-04	5.34E-04							1.42E-03	3.04E-03	1.58E-03
Total	2.21E+00	1.70E-01	2.14E-01	4.02E-01	3.53E-01	7.31E-01	3.39E-01	3.40E-01	4.44E-02	2.17E-01	7.18E-02	1.61E-01	6.91E-02	8.39E-02	8.99E-03	9.66E-02	8.76E-01

Manganese		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.38E-02	1.34E-03	4.45E-03	2.31E-02	2.11E-03	1.44E-02	1.39E-03	1.55E-03	3.24E-03	1.68E-02	1.54E-03	1.05E-02	1.01E-03	1.13E-03	1.19E-03	1.24E-02	1.98E-02
Sediment			1.78E+00	9.23E+00	8.44E-01	5.75E+00	5.54E-01	6.20E-01	3.37E-01	1.75E+00	1.60E-01	1.09E+00	1.05E-01	1.17E-01	5.78E-01	7.46E-01	4.24E-01
Soil	1.02E+00	1.78E-01															
Fish	6.36E-01		1.26E+00	6.53E+00	5.97E-01	4.07E+00	3.92E-01	4.39E-01									
Benthic			8.90E-01	4.61E+00	4.22E-01	2.87E+00	2.77E-01	3.10E-01									
Aquatic Veg			8.41E-02	4.36E-01	3.98E-02	2.71E-01	2.62E-02	2.93E-02									
Browse									1.59E-01	8.25E-01	7.55E-02	5.14E-01	4.96E-02	5.54E-02			
Forage	8.09E+00								6.29E+00	2.45E+01	6.29E+00	5.80E+00	6.29E+00	5.80E+00			
Berries	7.68E-01														2.80E-01	1.72E-01	2.00E-01
Lichen																	
Hare		2.24E-04	4.68E-04	1.85E-04	4.68E-04	4.67E-04	4.68E-04	4.67E-04							1.26E-03	1.26E-03	4.99E-04
Moose	1.20E-02	3.32E-02															
Caribou	7.73E-04	2.13E-03															
Ducks			2.71E-03	1.40E-02	1.28E-03	8.74E-03	8.44E-04	9.43E-04							2.23E-03	2.31E-02	3.70E-02
Total	1.05E+01	2.15E-01	4.02E+00	2.08E+01	1.91E+00	1.30E+01	1.25E+00	1.40E+00	6.79E+00	2.71E+01	6.53E+00	7.41E+00	6.45E+00	5.98E+00	8.63E-01	9.55E-01	6.81E-01

Nickel		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	3.35E-04	7.47E-05	1.35E-04	5.58E-04	5.87E-04	1.13E-03	9.90E-05	1.05E-04	9.82E-05	4.06E-04	4.28E-04	8.22E-04	7.21E-05	7.65E-05	8.51E-05	9.71E-04	4.80E-04
Sediment			5.10E-02	2.11E-01	2.22E-01	4.26E-01	3.74E-02	3.97E-02	9.65E-03	3.99E-02	4.20E-02	8.08E-02	7.08E-03	7.52E-03	3.86E-03	1.02E-02	7.71E-03
Soil	1.86E-02	2.46E-03															
Fish	3.77E-03		9.36E-03	3.87E-02	4.07E-02	7.83E-02	6.86E-03	7.29E-03									
Benthic			2.70E-03	1.12E-02	1.17E-02	2.26E-02	1.98E-03	2.10E-03									
Aquatic Veg			2.25E-04	9.30E-04	9.79E-04	1.88E-03	1.65E-04	1.75E-04									
Browse									4.26E-04	1.76E-03	1.85E-03	3.56E-03	3.13E-04	3.32E-04			
Forage	1.63E-02								2.42E-02	2.99E-02	2.42E-02	3.30E-02	2.42E-02	3.30E-02			
Berries	5.57E-03														1.10E-03	4.75E-03	1.45E-03
Lichen																	
Hare		1.56E-05	1.87E-05	2.78E-05	1.87E-05	3.19E-05	1.87E-05	3.19E-05							5.07E-05	8.62E-05	7.52E-05
Moose	1.08E-03	2.99E-03															
Caribou	7.86E-05	2.17E-04															
Ducks			1.57E-03	6.51E-03	6.85E-03	1.32E-02	1.15E-03	1.23E-03							3.05E-03	3.47E-02	1.72E-02
Total	4.57E-02	5.75E-03	6.50E-02	2.69E-01	2.83E-01	5.44E-01	4.77E-02	5.06E-02	3.44E-02	7.20E-02	6.85E-02	1.18E-01	3.17E-02	4.09E-02	8.14E-03	5.07E-02	2.69E-02

by Pathway

Silver	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.16E-05	9.29E-06	3.63E-05	1.44E-05	1.44E-05	1.44E-05	1.34E-05	3.79E-05	7.54E-06	2.94E-05	1.17E-05	1.17E-05	1.17E-05	2.87E-06	4.44E-06	2.26E-05	1.12E-05	2.87E-06	9.38E-08
Sediment	1.46E-03	4.60E-03	4.07E-03	4.07E-03	9.63E-03	4.07E-03	5.19E-05	1.61E-03	4.28E-03	3.79E-03	3.79E-03	8.96E-03	3.79E-03	6.93E-05	1.07E-04	5.46E-04	2.70E-04	6.93E-05	2.26E-06
Soil																			
Fish																			
Benthic																			
Aquatic Veg							8.84E-04							1.71E-03	2.65E-03	1.35E-02	6.69E-03	1.71E-03	5.60E-05
Browse	3.34E-05	6.10E-04	5.43E-03	5.00E-04	4.14E-03	2.23E-03	6.05E-04		9.87E-04	8.79E-03	8.09E-04	6.70E-03	3.61E-03	2.89E-03	4.48E-03	2.28E-02	1.13E-02	2.89E-03	9.45E-05
Forage	4.05E-06	4.05E-04	1.38E-03	1.20E-03	1.31E-03	5.00E-03		5.05E-04											
Berries									1.64E-04	2.62E-04	4.92E-04	5.14E-05	4.06E-04						
Lichen	3.57E-03																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	5.08E-03	5.62E-03	1.09E-02	5.79E-03	1.51E-02	1.13E-02	1.55E-03	2.16E-03	5.44E-03	1.29E-02	5.10E-03	1.57E-02	7.82E-03	4.68E-03	7.24E-03	3.69E-02	1.83E-02	4.68E-03	1.53E-04

Thallium	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment							n/a							n/a	n/a	n/a	n/a	n/a	n/a
Soil	n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a						
Fish																			
Benthic																			
Aquatic Veg							n/a							n/a	n/a	n/a	n/a	n/a	n/a
Browse	7.82E-06	5.68E-04	7.52E-04	7.52E-04	7.52E-04	7.52E-04	1.42E-04		9.19E-04	1.22E-03	1.22E-03	1.22E-03	1.22E-03	n/a	n/a	n/a	n/a	n/a	n/a
Forage	4.11E-06	3.08E-04	3.72E-04	3.62E-04	3.61E-03	2.44E-04		1.84E-03											
Berries									7.35E-05	6.46E-05	5.57E-05	8.44E-05	7.76E-05						
Lichen	1.59E-03																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	1.60E-03	8.77E-04	1.12E-03	1.11E-03	4.37E-03	9.96E-04	1.42E-04	1.84E-03	9.92E-04	1.28E-03	1.27E-03	1.30E-03	1.29E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Tin	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment							n/a							n/a	n/a	n/a	n/a	n/a	n/a
Soil	3.70E-03	1.02E-02	3.18E-02	1.66E-02	1.28E-02	1.57E-02		1.13E-02	9.47E-03	2.96E-02	1.54E-02	1.19E-02	1.46E-02						
Fish																			
Benthic														n/a	n/a	n/a	n/a	n/a	n/a
Aquatic Veg							n/a							n/a	n/a	n/a	n/a	n/a	n/a
Browse	9.98E-05	1.20E-02	2.01E-02	1.05E-02	8.09E-03	3.76E-03	1.81E-03		1.93E-02	3.25E-02	1.69E-02	1.31E-02	6.08E-03						
Forage	2.02E-05	8.95E-03	1.86E-03	6.42E-03	1.89E-03	6.61E-03		7.29E-03											
Berries									6.08E-04	3.23E-04	3.09E-02	2.91E-03	3.88E-04						
Lichen	1.85E-02																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	2.23E-02	3.11E-02	5.37E-02	3.34E-02	2.28E-02	2.61E-02	1.81E-03	1.86E-02	2.94E-02	6.24E-02	6.32E-02	2.79E-02	2.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

by Pathway

Silver	Merganser						Scaup						Hoary Marmot					Bear	
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	2.59E-06	4.00E-06	2.04E-05	1.01E-05	2.59E-06	8.45E-08	3.17E-06	4.91E-06	2.50E-05	1.24E-05	3.17E-06	1.04E-07	8.44E-06	3.30E-05	1.31E-05	1.31E-05	1.31E-05	5.94E-06	2.32E-05
Sediment	4.49E-05	6.95E-05	3.54E-04	1.75E-04	4.49E-05	1.47E-06	3.00E-04	4.65E-04	2.37E-03	1.17E-03	3.00E-04	9.82E-06							
Soil													2.06E-03	1.82E-03	1.82E-03	4.31E-03	1.82E-03	1.57E-03	1.39E-03
Fish	4.34E-03	6.71E-03	3.42E-02	1.69E-02	4.34E-03	1.42E-04												4.82E-04	1.88E-03
Benthic							2.77E-03	4.28E-03	2.18E-02	1.08E-02	2.77E-03	9.04E-05							
Aquatic Veg							1.40E-03	2.17E-03	1.10E-02	5.46E-03	1.40E-03	4.57E-05							
Browse																			
Forage													8.63E-04	2.95E-03	2.56E-03	2.79E-03	1.07E-02	1.52E-04	4.65E-04
Berries																		1.62E-04	1.37E-04
Lichen																			
Hare																			
Moose																		1.30E-05	1.30E-05
Caribou																		7.43E-06	7.43E-06
Ducks																			
Total	4.38E-03	6.79E-03	3.46E-02	1.71E-02	4.38E-03	1.43E-04	4.47E-03	6.92E-03	3.53E-02	1.75E-02	4.47E-03	1.46E-04	2.93E-03	4.81E-03	4.40E-03	7.11E-03	1.25E-02	2.40E-03	3.92E-03

Thallium	Merganser						Scaup						Hoary Marmot					Bear	
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a							
Soil													n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fish	n/a	n/a	n/a	n/a	n/a	n/a													
Benthic							n/a	n/a	n/a	n/a	n/a	n/a							
Aquatic Veg							n/a	n/a	n/a	n/a	n/a	n/a							
Browse																			
Forage													6.58E-04	7.94E-04	7.72E-04	7.71E-03	5.20E-04	1.16E-04	2.13E-04
Berries																		7.27E-05	1.27E-04
Lichen																			
Hare																			
Moose																		1.18E-05	1.18E-05
Caribou																		2.34E-05	2.34E-05
Ducks																			
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.58E-04	7.94E-04	7.72E-04	7.71E-03	5.20E-04	2.24E-04	3.75E-04

Tin	Merganser						Scaup						Hoary Marmot					Bear	
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a							
Soil													4.56E-03	1.42E-02	7.41E-03	5.73E-03	7.04E-03	3.48E-03	7.00E-03
Fish	n/a	n/a	n/a	n/a	n/a	n/a												n/a	n/a
Benthic							n/a	n/a	n/a	n/a	n/a	n/a							
Aquatic Veg							n/a	n/a	n/a	n/a	n/a	n/a							
Browse																			
Forage													1.91E-02	3.97E-03	1.37E-02	4.03E-03	1.41E-02	3.37E-03	1.06E-03
Berries																		6.01E-04	6.36E-04
Lichen																			
Hare																			
Moose																		1.51E-04	1.51E-04
Caribou																		3.26E-04	3.26E-04
Ducks																			
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.37E-02	1.82E-02	2.11E-02	9.76E-03	2.12E-02	7.93E-03	9.17E-03

by Pathway

Silver		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	9.19E-06	4.35E-06	9.90E-06	1.53E-05	7.81E-05	3.87E-05	9.90E-06	3.23E-07	7.21E-06	1.12E-05	5.69E-05	2.81E-05	7.21E-06	2.36E-07	8.51E-06	3.32E-05	1.32E-05
Sediment			1.94E-04	3.00E-04	1.53E-03	7.56E-04	1.94E-04	6.33E-06	3.67E-05	5.68E-05	2.89E-04	1.43E-04	3.67E-05	1.20E-06	6.53E-04	5.78E-04	1.07E-03
Soil	2.59E-03	3.44E-04															
Fish	7.46E-04		4.95E-03	7.66E-03	3.90E-02	1.93E-02	4.95E-03	1.62E-04									
Benthic			3.96E-04	6.13E-04	3.12E-03	1.55E-03	3.96E-04	1.29E-05									
Aquatic Veg			1.10E-03	1.70E-03	8.68E-03	4.30E-03	1.10E-03	3.59E-05									
Browse									2.08E-03	3.23E-03	1.64E-02	8.14E-03	2.08E-03	6.81E-05			
Forage	3.64E-04								9.69E-05	4.97E-04	9.69E-05	6.84E-04	9.69E-05	6.84E-04			
Berries	4.60E-05														4.22E-05	3.56E-05	1.20E-05
Lichen																	
Hare		2.49E-07	2.60E-07	6.97E-07	2.60E-07	5.05E-07	2.60E-07	5.05E-07							7.02E-07	1.36E-06	1.88E-06
Moose	1.30E-05	3.58E-05															
Caribou	7.43E-06	2.05E-05															
Ducks			1.11E-04	1.72E-04	8.77E-04	4.34E-04	1.11E-04	3.63E-06							2.93E-04	1.15E-03	4.54E-04
Total	3.77E-03	4.05E-04	6.76E-03	1.05E-02	5.33E-02	2.64E-02	6.76E-03	2.21E-04	2.22E-03	3.79E-03	1.69E-02	8.99E-03	2.22E-03	7.53E-04	9.98E-04	1.79E-03	1.55E-03

Thallium		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
Soil	n/a	n/a													n/a	n/a	n/a
Fish	n/a		n/a	n/a	n/a	n/a	n/a	n/a									
Benthic			n/a	n/a	n/a	n/a	n/a	n/a									
Aquatic Veg			n/a	n/a	n/a	n/a	n/a	n/a									
Browse									n/a	n/a	n/a	n/a	n/a	n/a			
Forage	1.10E-03								9.02E-05	9.29E-05	9.02E-05	1.19E-04	9.02E-05	1.19E-04			
Berries	7.55E-05														1.89E-05	3.32E-05	1.97E-05
Lichen																	
Hare		4.33E-07	4.05E-07	2.02E-06	4.05E-07	5.19E-07	4.05E-07	5.19E-07							1.09E-06	1.40E-06	5.45E-06
Moose	1.18E-05	3.26E-05															
Caribou	2.34E-05	6.44E-05															
Ducks			n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a
Total	1.21E-03	9.75E-05	4.05E-07	2.02E-06	4.05E-07	5.19E-07	4.05E-07	5.19E-07	9.02E-05	9.29E-05	9.02E-05	1.19E-04	9.02E-05	1.19E-04	2.00E-05	3.46E-05	2.51E-05

Tin		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
Soil	4.99E-03	8.70E-04													1.44E-03	2.90E-03	2.07E-03
Fish	n/a		n/a	n/a	n/a	n/a	n/a	n/a									
Benthic			n/a	n/a	n/a	n/a	n/a	n/a									
Aquatic Veg			n/a	n/a	n/a	n/a	n/a	n/a									
Browse									n/a	n/a	n/a	n/a	n/a	n/a			
Forage	8.08E-04								1.90E-03	4.79E-03	1.90E-03	2.05E-03	1.90E-03	2.05E-03			
Berries	1.53E-03														1.57E-04	1.66E-04	3.98E-04
Lichen																	
Hare		8.53E-06	1.44E-05	1.05E-05	1.44E-05	2.48E-05	1.44E-05	2.48E-05							3.88E-05	6.71E-05	2.84E-05
Moose	1.51E-04	4.16E-04															
Caribou	3.26E-04	8.99E-04															
Ducks			n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a
Total	7.81E-03	2.19E-03	1.44E-05	1.05E-05	1.44E-05	2.48E-05	1.44E-05	2.48E-05	1.90E-03	4.79E-03	1.90E-03	2.05E-03	1.90E-03	2.05E-03	1.64E-03	3.13E-03	2.50E-03

by Pathway

Zinc	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.59E-02	7.77E-04	3.40E-02	1.53E-01	1.53E-01	1.53E-01	1.83E-02	1.24E-02	6.30E-04	2.76E-02	1.24E-01	1.24E-01	1.24E-01	1.29E-03	4.73E-02	5.62E-04	1.05E-02	2.40E-04	5.50E-04
Sediment							6.38E-01							2.80E-01	1.02E+01	1.22E-01	2.28E+00	5.20E-02	1.19E-01
Soil	5.63E-01	6.50E-01	1.83E+00	1.00E+00	5.02E+00	2.99E+00		2.73E-01	6.05E-01	1.70E+00	9.35E-01	4.68E+00	2.78E+00						
Fish																			
Benthic														1.04E+01	3.79E+02	4.50E+00	8.44E+01	1.93E+00	4.41E+00
Aquatic Veg							1.57E+00							1.69E+00	6.20E+01	7.36E-01	1.38E+01	3.15E-01	7.21E-01
Browse	2.66E-01	1.25E+01	8.38E+00	9.45E+00	3.23E+01	2.57E+01	4.82E+00		2.03E+01	1.35E+01	1.53E+01	5.23E+01	4.16E+01						
Forage	1.30E-02	1.44E+00	1.30E+01	2.00E+00	4.61E+00	2.48E+00		1.49E+00	9.39E-02	1.48E-01	8.12E-02	2.44E-01	2.49E-01						
Berries																			
Lichen	2.13E+00																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	2.99E+00	1.46E+01	2.32E+01	1.26E+01	4.21E+01	3.13E+01	7.05E+00	1.77E+00	2.10E+01	1.54E+01	1.64E+01	5.73E+01	4.47E+01	1.23E+01	4.52E+02	5.36E+00	1.00E+02	2.29E+00	5.25E+00

by Pathway

Zinc	Merganser						Scaup						Hoary Marmot					Bear	
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	1.16E-03	4.26E-02	5.06E-04	9.47E-03	2.16E-04	4.95E-04	1.43E-03	5.23E-02	6.21E-04	1.16E-02	2.65E-04	6.08E-04	7.06E-04	3.09E-02	1.39E-01	1.39E-01	1.39E-01	4.97E-04	2.18E-02
Sediment	1.81E-01	6.64E+00	7.89E-02	1.48E+00	3.37E-02	7.72E-02	1.21E+00	4.45E+01	5.28E-01	9.89E+00	2.26E-01	5.17E-01							
Soil													2.91E-01	8.19E-01	4.50E-01	2.25E+00	1.34E+00	2.23E-01	4.56E-01
Fish	6.06E+00	2.22E+02	2.64E+00	4.94E+01	1.13E+00	2.58E+00												1.25E-01	5.49E+00
Benthic							1.67E+01	6.13E+02	7.28E+00	1.36E+02	3.11E+00	7.13E+00							
Aquatic Veg							8.19E-01	3.00E+01	3.56E-01	6.67E+00	1.52E-01	3.49E-01							
Browse																			
Forage													3.07E+00	2.77E+01	4.27E+00	9.84E+00	5.29E+00	5.42E-01	4.26E+00
Berries																		9.28E-02	1.66E-01
Lichen																			
Hare																			
Moose																		1.96E+00	1.96E+00
Caribou																		1.46E-01	1.46E-01
Ducks																			
Total	6.25E+00	2.29E+02	2.72E+00	5.09E+01	1.16E+00	2.66E+00	1.88E+01	6.87E+02	8.16E+00	1.53E+02	3.49E+00	7.99E+00	3.36E+00	2.86E+01	4.86E+00	1.22E+01	6.76E+00	3.09E+00	1.25E+01

by Pathway

Zinc		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	9.79E-02	5.96E-03	4.46E-03	1.63E-01	1.94E-03	3.63E-02	8.28E-04	1.90E-03	3.24E-03	1.19E-01	1.41E-03	2.64E-02	6.03E-04	1.38E-03	7.12E-04	3.12E-02	1.40E-01
Sediment			7.82E-01	2.86E+01	3.40E-01	6.37E+00	1.45E-01	3.33E-01	1.48E-01	5.42E+00	6.44E-02	1.21E+00	2.75E-02	6.31E-02			
Soil	1.31E+00	1.32E-01													9.23E-02	1.89E-01	5.44E-01
Fish	2.47E+01		6.92E+00	2.53E+02	3.01E+00	5.63E+01	1.29E+00	2.95E+00									
Benthic			2.39E+00	8.77E+01	1.04E+00	1.95E+01	4.45E-01	1.02E+00									
Aquatic Veg			6.44E-01	2.36E+01	2.80E-01	5.24E+00	1.20E-01	2.74E-01	1.22E+00	4.46E+01	5.30E-01	9.93E+00	2.27E-01	5.19E-01			
Browse									1.99E+00	3.84E+00	1.99E+00	2.83E+00	1.99E+00	2.83E+00			
Forage	1.38E+00																
Berries	2.03E-01														2.42E-02	4.32E-02	5.29E-02
Lichen																	
Hare		2.11E-02	2.25E-02	6.48E-02	2.25E-02	3.58E-02	2.25E-02	3.58E-02							6.08E-02	9.67E-02	1.75E-01
Moose	1.96E+00	5.41E+00															
Caribou	1.46E-01	4.01E-01															
Ducks			9.73E-01	3.56E+01	4.23E-01	7.92E+00	1.81E-01	4.14E-01							4.77E-01	2.09E+01	9.40E+01
Total	2.98E+01	5.97E+00	1.17E+01	4.29E+02	5.12E+00	9.54E+01	2.20E+00	5.02E+00	3.36E+00	5.40E+01	2.59E+00	1.40E+01	2.24E+00	3.42E+00	6.55E-01	2.13E+01	9.49E+01

Pct by Pathway

Percent Intake by Pathway

Arsenic	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.39%	0.16%	0.38%	1.60%	0.35%	0.59%	0.83%	2.77%	0.09%	0.30%	1.02%	0.24%	0.46%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
Sediment							33.45%							4.68%	4.68%	4.68%	4.68%	4.68%	4.68%
Soil	26.26%	22.34%	57.85%	38.93%	39.30%	66.91%		7.32%	15.44%	53.38%	28.52%	31.36%	59.42%						
Fish																			
Benthic														95.20%	95.20%	95.20%	95.20%	95.20%	95.20%
Aquatic Veg							0.28%							0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
Browse	1.97%	67.51%	25.44%	54.97%	48.35%	25.81%	65.44%		81.08%	40.78%	69.97%	67.03%	39.83%						
Forage	0.13%	9.99%	16.33%	4.50%	12.00%	6.69%		89.91%											
Berries									3.38%	5.54%	0.48%	1.37%	0.30%						
Lichen	71.25%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.43%	0.02%	0.08%	0.38%	0.10%	0.08%	0.04%	1.68%	0.01%	0.04%	0.28%	0.05%	0.04%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sediment							0.72%							0.33%	0.33%	0.33%	0.33%	0.33%	0.33%
Soil	22.23%	3.54%	2.48%	25.89%	4.29%	2.51%		22.26%	2.15%	1.48%	21.52%	2.58%	1.50%						
Fish																			
Benthic														38.26%	38.26%	38.26%	38.26%	38.26%	38.26%
Aquatic Veg							54.64%							61.40%	61.40%	61.40%	61.40%	61.40%	61.40%
Browse	28.30%	92.59%	94.60%	53.42%	92.83%	94.24%	44.60%		97.69%	97.86%	77.14%	97.03%	97.72%						
Forage	0.24%	3.85%	2.83%	20.30%	2.78%	3.17%		76.06%											
Berries									0.16%	0.62%	1.06%	0.33%	0.74%						
Lichen	48.80%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.43%	0.11%	0.17%	0.92%	0.54%	0.70%	0.29%	0.19%	0.08%	0.11%	0.67%	0.40%	0.50%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
Sediment							64.80%							30.45%	30.45%	30.45%	30.45%	30.45%	30.45%
Soil	34.67%	13.70%	25.31%	25.56%	46.67%	35.20%		4.44%	12.08%	19.63%	21.18%	40.37%	29.08%						
Fish																			
Benthic														66.28%	66.28%	66.28%	66.28%	66.28%	66.28%
Aquatic Veg							2.82%							3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
Browse	2.98%	53.44%	53.02%	44.82%	36.46%	43.50%	32.09%		81.92%	71.45%	64.55%	54.80%	62.45%						
Forage	0.44%	32.76%	21.50%	28.71%	16.33%	20.60%		95.37%											
Berries									5.91%	8.80%	13.60%	4.43%	7.97%						
Lichen	61.48%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Percent Intake by Pat

Arsenic	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.45%	0.56%	5.10%	0.73%	1.20%
Sediment	37.32%	37.32%	37.32%	37.32%	37.32%	37.32%	11.66%	11.66%	11.66%	11.66%	11.66%	11.66%					
Soil													31.79%	42.38%	61.16%	40.42%	66.91%
Fish	62.47%	62.47%	62.47%	62.47%	62.47%	62.47%											
Benthic							88.30%	88.30%	88.30%	88.30%	88.30%	88.30%					
Aquatic Veg							0.03%	0.03%	0.03%	0.03%	0.03%	0.03%					
Browse																	
Forage													67.76%	57.06%	33.74%	58.85%	31.90%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.15%	1.03%	0.63%	1.18%	0.95%
Sediment	6.62%	6.62%	6.62%	6.62%	6.62%	6.62%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%					
Soil													16.11%	15.37%	20.97%	24.20%	14.10%
Fish	93.29%	93.29%	93.29%	93.29%	93.29%	93.29%											
Benthic							66.51%	66.51%	66.51%	66.51%	66.51%	66.51%					
Aquatic Veg							31.95%	31.95%	31.95%	31.95%	31.95%	31.95%					
Browse																	
Forage													83.74%	83.60%	78.40%	74.62%	84.95%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.13%	0.27%	1.14%	0.87%	1.05%
Sediment	22.98%	22.98%	22.98%	22.98%	22.98%	22.98%	54.87%	54.87%	54.87%	54.87%	54.87%	54.87%					
Soil													8.05%	19.74%	15.55%	37.15%	26.10%
Fish	77.00%	77.00%	77.00%	77.00%	77.00%	77.00%											
Benthic							44.47%	44.47%	44.47%	44.47%	44.47%	44.47%					
Aquatic Veg							0.65%	0.65%	0.65%	0.65%	0.65%	0.65%					
Browse																	
Forage													91.82%	79.99%	83.31%	61.99%	72.84%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Percent Intake by Pat

Arsenic	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.56%	0.99%	1.22%	1.99%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%	0.98%	1.32%	1.56%	1.45%	0.70%	0.70%	1.30%	1.58%	1.65%
Sediment					31.20%	31.20%	31.20%	31.20%	31.20%	31.19%	51.45%	69.52%	81.86%	76.43%	36.73%	36.98%			
Soil	42.72%	51.23%	53.61%	83.09%													28.68%	23.59%	21.09%
Fish	8.13%	14.43%	17.67%		13.82%	13.82%	13.82%	13.82%	13.82%	13.81%									
Benthic					52.45%	52.45%	52.45%	52.45%	52.45%	52.45%									
Aquatic Veg					0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	1.41%	1.91%	2.25%	2.10%	1.01%	1.02%			
Browse											46.16%	27.24%	14.34%	20.01%	61.56%	61.30%			
Forage	20.98%	23.76%	20.35%														10.61%	2.59%	1.67%
Berries	25.14%	8.95%	6.77%																
Lichen																			
Hare				0.06%	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%							0.08%	0.04%	0.04%
Moose	1.86%	0.48%	0.30%	11.25%															
Caribou	0.60%	0.15%	0.10%	3.62%															
Ducks					2.30%	2.30%	2.30%	2.30%	2.30%	2.30%							59.34%	72.20%	75.54%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.29%	0.99%	1.09%	1.15%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.01%	0.02%	0.01%	0.02%	0.01%	0.01%	0.18%	0.35%	0.11%
Sediment					2.46%	2.31%	2.45%	2.45%	2.40%	2.40%	0.29%	0.38%	0.31%	0.35%	0.32%	0.28%			
Soil	33.99%	22.05%	19.67%	36.90%													6.15%	2.27%	0.57%
Fish	14.79%	49.77%	54.84%		9.17%	8.62%	9.12%	9.15%	8.95%	8.93%									
Benthic					23.62%	22.20%	23.49%	23.56%	23.05%	23.01%									
Aquatic Veg					62.33%	58.59%	62.00%	62.17%	60.82%	60.72%	73.17%	96.54%	78.91%	89.37%	82.29%	70.19%			
Browse											26.53%	3.06%	20.76%	10.26%	17.37%	29.52%			
Forage	40.70%	17.83%	14.91%														0.77%	0.40%	0.13%
Berries	6.74%	6.24%	7.18%																
Lichen																			
Hare				0.17%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							0.04%	0.03%	0.01%
Moose	3.15%	2.82%	2.09%	55.96%															
Caribou	0.33%	0.29%	0.22%	5.82%															
Ducks					2.39%	8.25%	2.91%	2.64%	4.75%	4.90%							92.86%	96.94%	99.18%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.19%	0.25%	0.44%	0.71%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.15%	0.29%	0.18%	0.24%	0.23%	0.21%	1.45%	1.50%	2.22%
Sediment					47.81%	47.82%	47.81%	47.82%	47.81%	47.81%	42.07%	83.82%	53.27%	70.15%	66.68%	59.43%			
Soil	13.09%	15.03%	15.14%	36.05%													28.50%	26.14%	21.96%
Fish	30.73%	39.95%	70.77%		42.39%	42.39%	42.39%	42.39%	42.39%	42.39%									
Benthic					8.61%	8.61%	8.61%	8.61%	8.61%	8.61%									
Aquatic Veg					0.69%	0.69%	0.69%	0.69%	0.69%	0.69%	6.10%	12.15%	7.72%	10.17%	9.67%	8.62%			
Browse											51.68%	3.74%	38.82%	19.44%	23.42%	31.74%			
Forage	34.39%	19.77%	6.94%														23.55%	24.29%	5.21%
Berries	17.20%	22.21%	5.71%																
Lichen																			
Hare				0.17%	0.02%	0.00%	0.01%	0.00%	0.01%	0.01%							0.61%	0.41%	0.19%
Moose	3.98%	2.53%	0.91%	57.12%															
Caribou	0.41%	0.26%	0.09%	5.94%															
Ducks					0.44%	0.44%	0.44%	0.44%	0.44%	0.44%							45.90%	47.66%	70.42%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Caribou	Hare					Moose	Sheep	Grouse					Mallard																	
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing												
Water	0.01%	0.62%	0.07%	0.03%	0.00%	0.01%	0.14%	1.05%	0.48%	0.06%	0.02%	0.00%	0.01%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%												
Sediment	32.73%	73.41%	80.05%	56.09%	78.85%	96.70%	18.54%	70.06%	65.13%	80.73%	42.86%	77.96%	97.03%	64.61%	64.61%	64.61%	64.61%	64.61%	64.61%												
Soil																															
Fish																															
Benthic																															
Aquatic Veg																															
Browse	0.38%	21.63%	10.49%	42.72%	12.68%	1.64%	1.39%	28.88%	33.35%	18.37%	56.73%	21.78%	2.85%	11.88%	11.88%	11.88%	11.88%	11.88%	11.88%												
Forage																															
Berries																															
Lichen																															
Hare																															
Moose	0.05%	4.34%	9.39%	1.17%	8.46%	1.66%	79.93%	1.05%	0.84%	0.39%	0.25%	0.11%																			
Caribou																															
Ducks																															
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%													100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.11%	0.00%	0.02%	0.07%	0.09%	0.02%	0.05%	0.03%	0.00%	0.02%	0.07%	0.09%	0.02%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
Sediment							3.78%							13.52%	13.52%	13.52%	13.52%	13.52%	13.52%
Soil	23.90%	6.71%	9.29%	5.30%	6.23%	2.51%		5.72%	5.50%	7.61%	6.56%	7.30%	2.35%						
Fish																			
Benthic														81.75%	81.75%	81.75%	81.75%	81.75%	81.75%
Aquatic Veg							0.54%							4.70%	4.70%	4.70%	4.70%	4.70%	4.70%
Browse	14.40%	65.23%	64.55%	36.82%	43.29%	58.89%	95.64%		92.93%	91.90%	79.19%	88.12%	95.82%						
Forage	1.98%	28.06%	26.14%	57.81%	50.38%	38.57%		94.26%											
Berries									1.58%	0.47%	14.18%	4.48%	1.81%						
Lichen	59.61%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.74%	0.05%	0.31%	0.45%	0.17%	0.09%	0.35%	0.57%	0.03%	0.22%	0.55%	0.11%	0.07%	0.13%	0.13%	0.13%	0.13%	0.13%	0.13%
Sediment							26.52%							59.71%	59.71%	59.71%	59.71%	59.71%	59.71%
Soil	38.92%	13.39%	28.33%	20.83%	18.08%	8.22%		1.66%	9.16%	23.32%	29.03%	13.26%	7.59%						
Fish																			
Benthic														38.22%	38.22%	38.22%	38.22%	38.22%	38.22%
Aquatic Veg							0.35%							1.94%	1.94%	1.94%	1.94%	1.94%	1.94%
Browse	9.69%	75.11%	51.88%	25.79%	66.97%	53.86%	72.77%		89.26%	74.18%	62.44%	85.30%	86.39%						
Forage	0.84%	11.46%	19.48%	52.92%	14.77%	37.82%		97.77%											
Berries									1.55%	2.28%	7.98%	1.33%	5.95%						
Lichen	49.80%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	1.32%	0.11%	0.09%	0.01%	0.02%
Sediment	64.16%	64.16%	64.16%	64.16%	64.16%	64.16%	86.51%	86.51%	86.51%	86.51%	86.51%	86.51%					
Soil													76.97%	64.05%	90.91%	66.14%	92.43%
Fish	35.73%	35.73%	35.73%	35.73%	35.73%	35.73%											
Benthic							11.69%	11.69%	11.69%	11.69%	11.69%	11.69%					
Aquatic Veg							1.77%	1.77%	1.77%	1.77%	1.77%	1.77%					
Browse																	
Forage													21.71%	35.84%	9.01%	33.85%	7.55%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.00%	0.03%	0.05%	0.07%	0.03%
Sediment	27.19%	27.19%	27.19%	27.19%	27.19%	27.19%	30.39%	30.39%	30.39%	30.39%	30.39%	30.39%					
Soil													4.77%	6.93%	1.89%	2.53%	1.35%
Fish	72.73%	72.73%	72.73%	72.73%	72.73%	72.73%											
Benthic							68.42%	68.42%	68.42%	68.42%	68.42%	68.42%					
Aquatic Veg							1.18%	1.18%	1.18%	1.18%	1.18%	1.18%					
Browse																	
Forage													95.23%	93.03%	98.07%	97.40%	98.62%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.18%	0.18%	0.18%	0.18%	0.18%	0.18%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.14%	0.51%	0.33%	0.40%	0.10%
Sediment	58.94%	58.94%	58.94%	58.94%	58.94%	58.94%	80.48%	80.48%	80.48%	80.48%	80.48%	80.48%					
Soil													19.66%	23.25%	7.60%	20.34%	4.36%
Fish	40.89%	40.89%	40.89%	40.89%	40.89%	40.89%											
Benthic							19.19%	19.19%	19.19%	19.19%	19.19%	19.19%					
Aquatic Veg							0.29%	0.29%	0.29%	0.29%	0.29%	0.29%					
Browse																	
Forage													80.20%	76.24%	92.07%	79.26%	95.55%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.09%	0.21%	0.01%	0.05%	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%	0.44%	0.16%	0.45%	0.41%	0.44%	0.36%	4.04%	0.81%	0.05%
Sediment					82.88%	78.31%	82.90%	82.63%	82.90%	82.27%	75.70%	27.51%	77.20%	71.05%	77.10%	63.17%			
Soil	68.87%	79.23%	88.09%	95.54%													74.06%	87.47%	92.25%
Fish	17.31%	3.37%	0.20%		12.21%	11.54%	12.21%	12.17%	12.21%	12.12%									
Benthic					2.49%	2.35%	2.49%	2.48%	2.49%	2.47%									
Aquatic Veg					2.07%	1.96%	2.07%	2.07%	2.07%	2.06%	18.92%	6.88%	19.30%	17.76%	19.28%	15.79%			
Browse											4.94%	65.46%	3.06%	10.78%	3.18%	20.68%			
Forage	4.47%	15.29%	10.70%														2.01%	0.98%	0.61%
Berries	2.97%	1.42%	0.93%																
Lichen																			
Hare				2.42%	0.06%	5.58%	0.04%	0.37%	0.04%	0.80%							4.14%	7.59%	6.91%
Moose	0.88%	0.08%	0.01%	0.33%															
Caribou	4.41%	0.40%	0.05%	1.67%															
Ducks					0.16%	0.15%	0.16%	0.16%	0.16%	0.16%							15.75%	3.15%	0.18%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.01%	0.05%	0.13%	0.62%	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%	0.05%	0.06%	0.02%	0.14%	0.02%	0.02%	0.14%	1.29%	2.91%
Sediment					44.26%	44.27%	44.26%	44.27%	44.25%	44.25%	4.96%	6.44%	2.45%	14.68%	1.63%	1.96%			
Soil	15.61%	10.29%	9.69%	82.85%													67.02%	78.16%	62.19%
Fish	0.43%	2.26%	6.03%		31.33%	31.33%	31.32%	31.33%	31.32%	31.32%									
Benthic					22.13%	22.13%	22.13%	22.13%	22.13%	22.13%									
Aquatic Veg					2.09%	2.09%	2.09%	2.09%	2.09%	2.09%	2.34%	3.04%	1.16%	6.93%	0.77%	0.93%			
Browse											92.64%	90.45%	96.37%	78.25%	97.59%	97.09%			
Forage	71.79%	83.56%	76.73%														32.44%	17.99%	29.38%
Berries	12.02%	3.77%	7.29%																
Lichen																			
Hare				0.10%	0.01%	0.00%	0.02%	0.00%	0.04%	0.03%							0.15%	0.13%	0.07%
Moose	0.13%	0.07%	0.11%	15.43%															
Caribou	0.01%	0.00%	0.01%	0.99%															
Ducks					0.07%	0.07%	0.07%	0.07%	0.07%	0.07%							0.26%	2.42%	5.44%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.25%	0.90%	0.73%	1.30%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%	0.29%	0.56%	0.62%	0.70%	0.23%	0.19%	1.05%	1.91%	1.78%
Sediment					78.45%	78.46%	78.46%	78.46%	78.44%	78.42%	28.08%	55.49%	61.35%	68.35%	22.37%	18.36%			
Soil	38.48%	32.65%	40.63%	42.74%													47.35%	20.09%	28.65%
Fish	2.76%	10.12%	8.24%		14.40%	14.40%	14.40%	14.40%	14.40%	14.39%									
Benthic					4.15%	4.15%	4.15%	4.15%	4.15%	4.15%									
Aquatic Veg					0.35%	0.35%	0.35%	0.35%	0.35%	0.35%	1.24%	2.45%	2.71%	3.02%	0.99%	0.81%			
Browse											70.39%	41.50%	35.32%	27.94%	76.42%	80.64%			
Forage	36.17%	30.58%	35.67%														13.56%	9.36%	5.40%
Berries	17.53%	24.21%	12.18%																
Lichen																			
Hare				0.27%	0.03%	0.01%	0.01%	0.01%	0.04%	0.06%							0.62%	0.17%	0.28%
Moose	4.48%	1.44%	2.37%	51.92%															
Caribou	0.33%	0.10%	0.17%	3.77%															
Ducks					2.42%	2.42%	2.42%	2.42%	2.42%	2.42%							37.42%	68.47%	63.89%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Silver	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.23%	0.17%	0.33%	0.25%	0.10%	0.13%	0.86%	1.76%	0.14%	0.23%	0.23%	0.07%	0.15%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%
Sediment							3.34%							1.48%	1.48%	1.48%	1.48%	1.48%	1.48%
Soil	28.78%	81.79%	37.27%	70.35%	63.80%	35.96%		74.82%	78.70%	29.45%	74.28%	57.00%	48.46%						
Fish																			
Benthic																			
Aquatic Veg							56.88%							36.61%	36.61%	36.61%	36.61%	36.61%	36.61%
Browse	0.66%	10.85%	49.74%	8.64%	27.45%	19.73%	38.93%		18.15%	68.29%	15.86%	42.60%	46.20%	61.85%	61.85%	61.85%	61.85%	61.85%	61.85%
Forage	0.08%	7.19%	12.65%	20.76%	8.66%	44.18%		23.43%											
Berries									3.01%	2.04%	9.64%	0.33%	5.20%						
Lichen	70.26%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water																			
Sediment																			
Soil																			
Fish																			
Benthic																			
Aquatic Veg																			
Browse	0.49%	64.82%	66.90%	67.54%	17.23%	75.52%	100.00%	100.00%	92.59%	94.96%	95.62%	93.51%	94.00%						
Forage	0.26%	35.18%	33.10%	32.46%	82.77%	24.48%													
Berries									7.41%	5.04%	4.38%	6.49%	6.00%						
Lichen	99.25%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	n/a	n/a	n/a	n/a	n/a	n/a

Tin	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water																			
Sediment																			
Soil	16.58%	32.74%	59.17%	49.51%	56.21%	60.26%		60.77%	32.20%	47.43%	24.38%	42.70%	69.35%						
Fish																			
Benthic																			
Aquatic Veg																			
Browse	0.45%	38.46%	37.37%	31.27%	35.50%	14.41%	100.00%		65.73%	52.05%	26.75%	46.86%	28.81%						
Forage	0.09%	28.80%	3.46%	19.21%	8.30%	25.33%		39.23%											
Berries									2.07%	0.52%	48.87%	10.44%	1.84%						
Lichen	82.88%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	n/a	n/a	n/a	n/a	n/a	n/a

Pct by Pathway

Silver	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%	0.29%	0.69%	0.30%	0.18%	0.10%
Sediment	1.02%	1.02%	1.02%	1.02%	1.02%	1.02%	6.72%	6.72%	6.72%	6.72%	6.72%	6.72%					
Soil													70.25%	37.92%	41.42%	60.60%	14.57%
Fish	98.92%	98.92%	98.92%	98.92%	98.92%	98.92%											
Benthic							61.91%	61.91%	61.91%	61.91%	61.91%	61.91%					
Aquatic Veg							31.30%	31.30%	31.30%	31.30%	31.30%	31.30%					
Browse																	
Forage													29.46%	61.39%	58.28%	39.22%	85.33%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water																	
Sediment																	
Soil																	
Fish																	
Benthic																	
Aquatic Veg																	
Browse																	
Forage													100.00%	100.00%	100.00%	100.00%	100.00%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100.00%	100.00%	100.00%	100.00%	100.00%

Tin	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water																	
Sediment																	
Soil													19.25%	78.18%	35.08%	58.69%	33.28%
Fish																	
Benthic																	
Aquatic Veg																	
Browse																	
Forage													80.75%	21.82%	64.92%	41.31%	66.72%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Silver	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.25%	0.59%	0.24%	1.08%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%	0.32%	0.29%	0.34%	0.31%	0.32%	0.03%	0.85%	1.85%	0.85%
Sediment					2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	1.65%	1.50%	1.71%	1.59%	1.65%	0.16%			
Soil	65.70%	35.56%	68.59%	84.96%													65.43%	32.21%	69.04%
Fish	20.10%	47.99%	19.76%		73.21%	73.20%	73.21%	73.21%	73.21%	73.04%									
Benthic					5.86%	5.86%	5.86%	5.86%	5.86%	5.85%									
Aquatic Veg					16.28%	16.27%	16.28%	16.28%	16.28%	16.24%	93.67%	85.10%	97.38%	90.49%	93.67%	9.04%			
Browse											4.36%	13.11%	0.57%	7.60%	4.36%	90.77%			
Forage	6.35%	11.86%	9.64%														4.23%	1.99%	0.77%
Berries	6.75%	3.49%	1.22%																
Lichen																			
Hare				0.06%	0.00%	0.01%	0.00%	0.00%	0.00%	0.23%							0.07%	0.08%	0.12%
Moose	0.54%	0.33%	0.34%	8.85%															
Caribou	0.31%	0.19%	0.20%	5.06%															
Ducks					1.65%	1.65%	1.65%	1.65%	1.65%	1.64%							29.42%	63.88%	29.22%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water																			
Sediment																			
Soil																			
Fish																			
Benthic																			
Aquatic Veg																			
Browse											100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			
Forage	51.82%	56.71%	90.84%														94.54%	95.94%	78.31%
Berries	32.46%	33.91%	6.25%																
Lichen																			
Hare				0.44%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%							5.46%	4.06%	21.69%
Moose	5.29%	3.15%	0.98%	33.46%															
Caribou	10.44%	6.23%	1.93%	66.09%															
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Tin	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water																			
Sediment																			
Soil	43.94%	76.27%	63.96%	39.65%													88.09%	92.57%	82.91%
Fish																			
Benthic																			
Aquatic Veg																			
Browse											100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			
Forage	42.47%	11.60%	10.35%														9.54%	5.29%	15.95%
Berries	7.57%	6.93%	19.57%																
Lichen																			
Hare				0.39%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%							2.37%	2.14%	1.14%
Moose	1.90%	1.65%	1.93%	18.97%															
Caribou	4.11%	3.56%	4.18%	40.99%															
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.53%	0.01%	0.15%	1.21%	0.36%	0.49%	0.26%	0.70%	0.00%	0.18%	0.76%	0.22%	0.28%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Sediment	18.86%	4.45%	7.88%	7.97%	11.93%	9.55%	9.04%	15.38%	2.89%	11.05%	5.69%	8.16%	6.22%	2.27%	2.27%	2.27%	2.27%	2.27%	2.27%
Soil																			
Fish																			
Benthic														83.99%	83.99%	83.99%	83.99%	83.99%	83.99%
Aquatic Veg							22.32%							13.73%	13.73%	13.73%	13.73%	13.73%	13.73%
Browse	8.92%	85.70%	36.05%	74.95%	76.76%	82.06%	68.37%		96.66%	87.82%	93.06%	91.20%	92.94%						
Forage	0.44%	9.85%	55.92%	15.87%	10.95%	7.90%		83.92%											
Berries									0.45%	0.96%	0.49%	0.43%	0.56%						
Lichen	71.26%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.02%	0.11%	2.86%	1.14%	2.06%
Sediment	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	6.47%	6.47%	6.47%	6.47%	6.47%	6.47%					
Soil													8.65%	2.87%	9.25%	18.40%	19.80%
Fish	97.08%	97.08%	97.08%	97.08%	97.08%	97.08%											
Benthic							89.16%	89.16%	89.16%	89.16%	89.16%	89.16%					
Aquatic Veg							4.36%	4.36%	4.36%	4.36%	4.36%	4.36%					
Browse																	
Forage													91.33%	97.02%	87.89%	80.47%	78.14%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.02%	0.17%	0.33%	0.10%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.10%	0.22%	0.05%	0.19%	0.03%	0.04%	0.11%	0.15%	0.15%
Sediment					6.66%	6.68%	6.65%	6.67%	6.61%	6.63%	4.41%	10.04%	2.49%	8.62%	1.23%	1.85%			
Soil	7.20%	3.65%	4.41%	2.22%													14.09%	0.89%	0.57%
Fish	4.05%	43.89%	82.87%		58.94%	59.04%	58.79%	59.03%	58.45%	58.63%									
Benthic					20.40%	20.44%	20.35%	20.43%	20.23%	20.29%									
Aquatic Veg					5.48%	5.49%	5.47%	5.49%	5.44%	5.45%									
Browse											36.28%	82.63%	20.50%	70.95%	10.10%	15.20%			
Forage	17.51%	34.08%	4.62%								59.21%	7.11%	76.95%	20.24%	88.65%	82.92%			
Berries	3.00%	1.33%	0.68%														3.69%	0.20%	0.06%
Lichen																			
Hare				0.35%	0.19%	0.02%	0.44%	0.04%	1.02%	0.71%							9.29%	0.45%	0.18%
Moose	63.52%	15.72%	6.60%	90.62%															
Caribou	4.71%	1.16%	0.49%	6.71%															
Ducks					8.29%	8.30%	8.27%	8.30%	8.22%	8.24%							72.83%	98.31%	99.04%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

APPENDIX F-6

TREAT ALL FLOWS SCENARIO

(SUMMARY TERRESTRIAL ECOLOGICAL RECEPTOR RESULTS)

by Pathway

Intake by Pathway (mg/kg d)

Intake by Pathway (mg/kg d)																			
Arsenic	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	9.88E-05	5.35E-05	3.62E-04	1.34E-04	1.34E-04	1.34E-04	1.14E-04	3.03E-04	4.35E-05	2.94E-04	1.09E-04	1.09E-04	1.09E-04	3.09E-05	4.14E-05	1.58E-04	1.12E-04	1.66E-05	1.71E-05
Sediment							4.57E-03							7.71E-03	1.03E-02	3.95E-02	2.79E-02	4.13E-03	4.27E-03
Soil	9.88E-03	7.64E-03	5.69E-02	1.77E-02	8.22E-02	8.27E-02		8.07E-04	7.11E-03	5.29E-02	1.65E-02	7.65E-02	7.69E-02						
Fish																			
Benthic														1.57E-01	2.10E-01	8.03E-01	5.68E-01	8.40E-02	8.69E-02
Aquatic Veg							3.77E-05							1.56E-04	2.09E-04	7.98E-04	5.64E-04	8.34E-05	8.63E-05
Browse	7.40E-04	2.31E-02	2.50E-02	2.50E-02	1.01E-01	3.19E-02	1.34E-02		3.73E-02	4.04E-02	4.04E-02	1.64E-01	5.16E-02						
Forage	4.76E-05	3.41E-03	1.61E-02	2.05E-03	2.51E-02	8.26E-03		9.92E-03											
Berries									1.56E-03	5.49E-03	2.79E-04	3.33E-03	3.88E-04						
Lichen	2.68E-02																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	3.76E-02	3.42E-02	9.83E-02	4.49E-02	2.09E-01	1.23E-01	1.81E-02	1.10E-02	4.60E-02	9.92E-02	5.73E-02	2.43E-01	1.29E-01	1.65E-01	2.21E-01	8.44E-01	5.96E-01	8.82E-02	9.13E-02

Cadmium	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	2.99E-05	4.64E-05	1.43E-04	6.80E-05	6.80E-05	6.80E-05	3.45E-05	6.25E-05	3.77E-05	1.16E-04	5.52E-05	5.52E-05	5.52E-05	8.35E-06	2.10E-05	1.15E-05	4.43E-05	1.44E-05	1.44E-05
Sediment							5.70E-04							8.59E-04	2.16E-03	1.18E-03	4.55E-03	1.48E-03	1.48E-03
Soil	2.46E-03	1.00E-02	5.30E-03	1.75E-02	1.08E-02	7.79E-03		9.69E-04	9.35E-03	4.93E-03	1.62E-02	1.00E-02	7.25E-03						
Fish																			
Benthic														9.97E-02	2.51E-01	1.37E-01	5.28E-01	1.71E-01	1.72E-01
Aquatic Veg							4.33E-02							1.60E-01	4.02E-01	2.20E-01	8.48E-01	2.75E-01	2.76E-01
Browse	3.14E-03	2.63E-01	2.02E-01	3.60E-02	2.33E-01	2.93E-01	5.68E-02		4.25E-01	3.26E-01	5.82E-02	3.77E-01	4.74E-01						
Forage	2.66E-05	1.09E-02	6.05E-03	1.37E-02	6.97E-03	9.84E-03		3.31E-03											
Berries									6.90E-04	2.07E-03	7.99E-04	1.28E-03	3.59E-03						
Lichen	5.41E-03																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	1.11E-02	2.84E-01	2.13E-01	6.72E-02	2.51E-01	3.11E-01	1.01E-01	4.34E-03	4.35E-01	3.34E-01	7.53E-02	3.88E-01	4.84E-01	2.61E-01	6.55E-01	3.59E-01	1.38E+00	4.48E-01	4.49E-01

Copper	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	2.44E-04	4.63E-04	1.30E-03	4.23E-04	4.23E-04	4.23E-04	2.82E-04	5.29E-04	3.76E-04	1.06E-03	3.43E-04	3.43E-04	3.43E-04	4.09E-05	1.31E-04	6.89E-05	4.03E-04	1.43E-04	1.43E-04
Sediment							6.21E-02							5.61E-02	1.79E-01	9.45E-02	5.53E-01	1.96E-01	1.96E-01
Soil	4.54E-02	5.89E-02	1.43E-01	1.29E-01	4.06E-01	2.34E-01		9.69E-03	5.48E-02	1.33E-01	1.20E-01	3.78E-01	2.18E-01						
Fish																			
Benthic														1.22E-01	3.90E-01	2.06E-01	1.20E+00	4.27E-01	4.26E-01
Aquatic Veg							2.70E-03							5.98E-03	1.91E-02	1.01E-02	5.89E-02	2.09E-02	2.09E-02
Browse	3.90E-03	2.30E-01	2.99E-01	2.27E-01	3.17E-01	2.89E-01	7.07E-02		3.71E-01	4.83E-01	3.66E-01	5.13E-01	4.68E-01						
Forage	5.77E-04	1.41E-01	1.21E-01	1.45E-01	1.42E-01	1.37E-01		2.08E-01											
Berries									2.68E-02	5.95E-02	7.72E-02	4.15E-02	5.98E-02						
Lichen	8.05E-02																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	1.31E-01	4.30E-01	5.64E-01	5.01E-01	8.66E-01	6.61E-01	1.36E-01	2.18E-01	4.53E-01	6.76E-01	5.64E-01	9.33E-01	7.46E-01	1.84E-01	5.89E-01	3.10E-01	1.82E+00	6.44E-01	6.43E-01

by Pathway

Intake by Pathway (µg)

Pathway	Merganser						Scaup						Hoary Marmot					Bear	
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	2.78E-05	3.73E-05	1.43E-04	1.01E-04	1.49E-05	1.54E-05	3.41E-05	4.58E-05	1.75E-04	1.24E-04	1.83E-05	1.89E-05	4.87E-05	3.29E-04	1.22E-04	1.22E-04	1.22E-04	3.42E-05	2.32E-04
Sediment	5.00E-03	6.70E-03	2.56E-02	1.81E-02	2.68E-03	2.77E-03	3.35E-02	4.48E-02	1.71E-01	1.21E-01	1.79E-02	1.85E-02							
Soil													3.42E-03	2.55E-02	7.93E-03	3.68E-02	3.70E-02	2.61E-03	1.23E-02
Fish	8.37E-03	1.12E-02	4.29E-02	3.03E-02	4.48E-03	4.64E-03												4.98E-04	3.37E-03
Benthic							2.53E-01	3.40E-01	1.30E+00	9.17E-01	1.36E-01	1.40E-01							
Aquatic Veg							7.54E-05	1.01E-04	3.86E-04	2.73E-04	4.03E-05	4.18E-05							
Browse																			
Forage																			
Berries													7.28E-03	3.43E-02	4.37E-03	5.36E-02	1.76E-02	1.28E-03	5.69E-03
Lichen																		1.54E-03	2.14E-03
Hare																			
Moose																		1.01E-04	1.01E-04
Caribou																		3.66E-05	3.66E-05
Ducks																			
Total	1.34E-02	1.80E-02	6.86E-02	4.85E-02	7.17E-03	7.42E-03	2.87E-01	3.85E-01	1.47E+00	1.04E+00	1.54E-01	1.59E-01	1.08E-02	6.01E-02	1.24E-02	9.05E-02	5.48E-02	6.11E-03	2.38E-02

Pathway	Merganser						Scaup						Hoary Marmot					Bear	
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	7.52E-06	1.89E-05	1.04E-05	3.99E-05	1.29E-05	1.30E-05	9.23E-06	2.32E-05	1.27E-05	4.89E-05	1.59E-05	1.59E-05	4.22E-05	1.30E-04	6.18E-05	6.18E-05	6.18E-05	2.97E-05	9.16E-05
Sediment	5.57E-04	1.40E-03	7.67E-04	2.95E-03	9.57E-04	9.59E-04	3.73E-03	9.37E-03	5.13E-03	1.97E-02	6.40E-03	6.42E-03							
Soil													4.50E-03	2.37E-03	7.81E-03	4.82E-03	3.49E-03	3.44E-03	2.49E-03
Fish	7.84E-03	1.97E-02	1.08E-02	4.16E-02	1.35E-02	1.35E-02												1.50E-03	4.62E-03
Benthic							1.61E-01	4.05E-01	2.22E-01	8.54E-01	2.77E-01	2.77E-01							
Aquatic Veg							7.74E-02	1.95E-01	1.07E-01	4.10E-01	1.33E-01	1.33E-01							
Browse																			
Forage																			
Berries																			
Lichen																			
Hare																			
Moose																		1.96E-04	1.96E-04
Caribou																		3.31E-05	3.31E-05
Ducks																			
Total	8.41E-03	2.11E-02	1.16E-02	4.46E-02	1.44E-02	1.45E-02	2.42E-01	6.09E-01	3.34E-01	1.28E+00	4.16E-01	4.17E-01	2.79E-02	1.54E-02	3.71E-02	1.98E-02	2.45E-02	9.99E-03	1.01E-02

Pathway	Merganser						Scaup						Hoary Marmot					Bear	
	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	3.68E-05	1.18E-04	6.21E-05	3.63E-04	1.29E-04	1.29E-04	4.52E-05	1.44E-04	7.62E-05	4.45E-04	1.58E-04	1.58E-04	4.21E-04	1.19E-03	3.85E-04	3.85E-04	3.85E-04	2.96E-04	8.34E-04
Sediment	3.64E-02	1.16E-01	6.13E-02	3.58E-01	1.27E-01	1.27E-01	2.43E-01	7.78E-01	4.10E-01	2.40E+00	8.51E-01	8.50E-01							
Soil													2.63E-02	6.38E-02	5.78E-02	1.82E-01	1.05E-01	2.01E-02	3.64E-02
Fish	1.22E-01	3.89E-01	2.05E-01	1.20E+00	4.26E-01	4.25E-01												4.73E-02	1.33E-01
Benthic							1.97E-01	6.30E-01	3.32E-01	1.94E+00	6.90E-01	6.89E-01							
Aquatic Veg							2.89E-03	9.24E-03	4.87E-03	2.85E-02	1.01E-02	1.01E-02							
Browse																			
Forage																			
Berries													3.00E-01	2.58E-01	3.10E-01	3.03E-01	2.93E-01	5.30E-02	4.79E-02
Lichen																		2.65E-02	5.38E-02
Hare																			
Moose																		3.78E-03	3.78E-03
Caribou																		6.36E-04	6.36E-04
Ducks																			
Total	1.58E-01	5.06E-01	2.67E-01	1.56E+00	5.53E-01	5.53E-01	4.43E-01	1.42E+00	7.47E-01	4.37E+00	1.55E+00	1.55E+00	3.27E-01	3.23E-01	3.68E-01	4.85E-01	3.98E-01	1.52E-01	2.77E-01

by Pathway

Intake by Pathway (µg)

Arsenic		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	8.57E-05	3.71E-05	1.07E-04	1.43E-04	5.46E-04	3.86E-04	5.71E-05	5.91E-05	7.76E-05	1.04E-04	3.98E-04	2.81E-04	4.16E-05	4.30E-05	4.91E-05	3.32E-04	1.23E-04
Sediment			2.16E-02	2.89E-02	1.10E-01	7.81E-02	1.15E-02	1.19E-02	4.08E-03	5.47E-03	2.09E-02	1.48E-02	2.19E-03	2.26E-03	1.08E-03	5.08E-03	8.51E-03
Soil	2.05E-02	2.32E-03															
Fish	1.25E-03		9.55E-03	1.28E-02	4.89E-02	3.46E-02	5.11E-03	5.29E-03									
Benthic			3.63E-02	4.86E-02	1.86E-01	1.31E-01	1.94E-02	2.01E-02									
Aquatic Veg			5.92E-05	7.94E-05	3.03E-04	2.14E-04	3.17E-05	3.28E-05	1.12E-04	1.50E-04	5.75E-04	4.06E-04	6.01E-05	6.22E-05			
Browse									3.66E-03	1.16E-02	3.66E-03	3.97E-03	3.66E-03	3.97E-03			
Forage	7.79E-03																
Berries	2.59E-03														4.01E-04	5.58E-04	6.75E-04
Lichen																	
Hare		1.73E-06	1.05E-06	6.42E-06	1.05E-06	3.03E-06	1.05E-06	3.03E-06							2.84E-06	8.18E-06	1.74E-05
Moose	1.01E-04	2.78E-04															
Caribou	3.66E-05	1.01E-04															
Ducks			1.59E-03	2.13E-03	8.13E-03	5.75E-03	8.50E-04	8.79E-04							2.24E-03	1.52E-02	5.61E-03
Total	3.24E-02	2.74E-03	6.91E-02	9.26E-02	3.54E-01	2.50E-01	3.70E-02	3.83E-02	7.94E-03	1.74E-02	2.56E-02	1.94E-02	5.95E-03	6.34E-03	3.78E-03	2.11E-02	1.49E-02

Cadmium		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	4.35E-05	1.12E-05	2.88E-05	7.25E-05	3.97E-05	1.53E-04	4.95E-05	4.96E-05	2.10E-05	5.28E-05	2.89E-05	1.11E-04	3.60E-05	3.61E-05	4.26E-05	1.31E-04	6.23E-05
Sediment			2.40E-03	6.04E-03	3.31E-03	1.27E-02	4.13E-03	4.13E-03	4.55E-04	1.14E-03	6.27E-04	2.41E-03	7.81E-04	7.83E-04	1.43E-03	1.03E-03	1.24E-03
Soil	3.00E-03	5.79E-04															
Fish	2.19E-03		8.95E-03	2.25E-02	1.23E-02	4.74E-02	1.54E-02	1.54E-02									
Benthic			2.30E-02	5.80E-02	3.18E-02	1.22E-01	3.96E-02	3.97E-02									
Aquatic Veg			6.08E-02	1.53E-01	8.38E-02	3.22E-01	1.05E-01	1.05E-01	1.15E-01	2.90E-01	1.59E-01	6.11E-01	1.98E-01	1.98E-01			
Browse									4.18E-02	3.50E-02	4.18E-02	8.53E-02	4.18E-02	8.53E-02			
Forage	2.27E-03																
Berries	1.09E-03														1.78E-04	1.84E-04	2.85E-04
Lichen																	
Hare		2.67E-06	3.44E-06	6.93E-06	3.44E-06	4.51E-06	3.44E-06	4.51E-06							9.30E-06	1.22E-05	1.87E-05
Moose	1.96E-04	5.42E-04															
Caribou	3.31E-05	9.12E-05															
Ducks			2.33E-03	7.46E-03	3.93E-03	2.30E-02	8.16E-03	8.14E-03							2.15E-02	6.07E-02	1.97E-02
Total	8.82E-03	1.23E-03	9.76E-02	2.47E-01	1.35E-01	5.28E-01	1.72E-01	1.72E-01	1.57E-01	3.26E-01	2.01E-01	6.98E-01	2.41E-01	2.85E-01	2.32E-02	6.20E-02	2.13E-02

Copper		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	2.70E-04	9.16E-05	1.41E-04	4.51E-04	2.38E-04	1.39E-03	4.93E-04	4.93E-04	1.03E-04	3.28E-04	1.73E-04	1.01E-03	3.59E-04	3.59E-04	4.24E-04	1.20E-03	3.88E-04
Sediment			1.57E-01	5.01E-01	2.64E-01	1.55E+00	5.48E-01	5.47E-01	2.97E-02	9.49E-02	5.00E-02	2.93E-01	1.04E-01	1.04E-01	8.35E-03	1.51E-02	4.22E-02
Soil	1.02E-01	1.07E-02															
Fish	4.33E-02		1.39E-01	4.44E-01	2.34E-01	1.37E+00	4.86E-01	4.85E-01									
Benthic			2.82E-02	9.02E-02	4.76E-02	2.78E-01	9.87E-02	9.85E-02									
Aquatic Veg			2.27E-03	7.27E-03	3.83E-03	2.24E-02	7.95E-03	7.94E-03	4.30E-03	1.38E-02	7.26E-03	4.24E-02	1.51E-02	1.50E-02			
Browse									3.65E-02	4.66E-02	3.65E-02	5.88E-02	3.65E-02	5.88E-02			
Forage	4.67E-02																
Berries	3.84E-02														6.90E-03	1.40E-02	1.00E-02
Lichen																	
Hare		5.14E-05	6.62E-05	1.33E-04	6.62E-05	8.68E-05	6.62E-05	8.68E-05							1.79E-04	2.34E-04	3.60E-04
Moose	3.78E-03	1.04E-02															
Caribou	6.36E-04	1.75E-03															
Ducks			1.46E-03	4.66E-03	2.46E-03	1.44E-02	5.10E-03	5.09E-03							1.35E-02	3.79E-02	1.23E-02
Total	2.35E-01	2.30E-02	3.28E-01	1.05E+00	5.53E-01	3.23E+00	1.15E+00	1.14E+00	7.06E-02	1.56E-01	9.39E-02	3.95E-01	1.56E-01	1.78E-01	2.93E-02	6.84E-02	6.53E-02

by Pathway

Lead	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	2.20E-04	3.96E-04	8.60E-04	3.98E-04	3.98E-04	3.98E-04	2.54E-04	4.40E-04	3.21E-04	6.98E-04	3.23E-04	3.23E-04	3.23E-04	7.72E-05	1.23E-04	1.27E-04	2.66E-04	1.22E-04	1.22E-04
Sediment							3.35E-02							6.35E-02	1.01E-01	1.05E-01	2.19E-01	1.01E-01	1.00E-01
Soil	6.91E-01	4.69E-02	1.01E+00	9.32E-01	8.20E+00	3.73E+00		2.91E-02	4.37E-02	9.38E-01	8.68E-01	7.63E+00	3.47E+00						
Fish														2.30E-02	3.67E-02	3.80E-02	7.93E-02	3.65E-02	3.63E-02
Benthic							2.52E-03							1.17E-02	1.86E-02	1.93E-02	4.02E-02	1.85E-02	1.84E-02
Aquatic Veg							1.46E-01		2.24E-02	2.13E-01	1.15E+00	2.13E+00	1.02E-01						
Browse	8.09E-03	1.38E-02	1.32E-01	7.10E-01	1.32E+00	6.31E-02		1.20E-02	7.02E-04	9.71E-03	7.98E-03	2.46E-02	3.96E-03						
Forage	1.04E-03	2.77E-03	1.18E-01	1.94E-02	8.80E-01	6.39E-02													
Berries																			
Lichen	1.41E+00																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	2.11E+00	6.39E-02	1.26E+00	1.66E+00	1.04E+01	3.86E+00	1.83E-01	4.15E-02	6.70E-02	1.16E+00	2.02E+00	9.79E+00	3.58E+00	9.83E-02	1.56E-01	1.62E-01	3.39E-01	1.56E-01	1.55E-01

Manganese	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.10E-03	1.30E-03	2.07E-03	2.71E-03	2.71E-03	2.71E-03	1.27E-03	1.40E-03	1.06E-03	1.68E-03	2.20E-03	2.20E-03	2.20E-03	1.29E-03	8.38E-04	6.12E-04	6.40E-04	4.02E-04	4.12E-04
Sediment							1.01E-01							6.37E-01	4.13E-01	3.02E-01	3.16E-01	1.98E-01	2.03E-01
Soil	7.58E-01	4.07E+00	5.63E+00	1.67E+00	1.49E+00	2.18E+00		1.07E+00	3.79E+00	5.24E+00	1.56E+00	1.39E+00	2.03E+00						
Fish														3.85E+00	2.50E+00	1.83E+00	1.91E+00	1.20E+00	1.23E+00
Benthic							1.43E-02							2.21E-01	1.44E-01	1.05E-01	1.10E-01	6.89E-02	7.06E-02
Aquatic Veg							8.27E+00		6.41E+01	6.33E+01	1.88E+01	1.68E+01	8.24E+01						
Browse	4.57E-01	3.96E+01	3.91E+01	1.16E+01	1.04E+01	5.10E+01		1.77E+01	1.09E+00	3.26E-01	3.37E+00	8.54E-01	1.55E+00						
Forage	6.27E-02	1.70E+01	1.59E+01	1.83E+01	1.21E+01	3.34E+01													
Berries																			
Lichen	1.89E+00																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	3.17E+00	6.08E+01	6.06E+01	3.16E+01	2.40E+01	8.65E+01	8.39E+00	1.88E+01	6.90E+01	6.89E+01	2.37E+01	1.90E+01	8.60E+01	4.71E+00	3.06E+00	2.23E+00	2.33E+00	1.47E+00	1.50E+00

Nickel	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.73E-04	9.29E-05	9.18E-04	3.48E-04	3.48E-04	3.48E-04	2.00E-04	5.08E-04	7.54E-05	7.45E-04	2.83E-04	2.83E-04	2.83E-04	3.91E-05	1.08E-04	1.70E-04	2.84E-04	2.87E-05	3.02E-05
Sediment							1.50E-02							1.82E-02	5.02E-02	7.94E-02	1.32E-01	1.34E-02	1.41E-02
Soil	1.05E-02	2.72E-02	9.78E-02	2.42E-02	5.45E-02	4.66E-02		1.61E-03	2.53E-02	9.11E-02	2.26E-02	5.07E-02	4.34E-02						
Fish														1.17E-02	3.21E-02	5.08E-02	8.46E-02	8.56E-03	9.00E-03
Benthic							1.98E-04							5.92E-04	1.63E-03	2.58E-03	4.29E-03	4.34E-04	4.56E-04
Aquatic Veg							4.72E-02		2.46E-01	2.90E-01	4.85E-02	3.26E-01	4.94E-01						
Browse	2.61E-03	1.52E-01	1.79E-01	3.00E-02	2.02E-01	3.05E-01		9.51E-02	4.29E-03	8.91E-03	6.20E-03	5.09E-03	3.40E-02						
Forage	2.27E-04	2.32E-02	6.73E-02	6.16E-02	4.45E-02	2.14E-01													
Berries																			
Lichen	1.34E-02																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	2.69E-02	2.03E-01	3.45E-01	1.16E-01	3.01E-01	5.67E-01	6.26E-02	9.72E-02	2.76E-01	3.90E-01	7.76E-02	3.83E-01	5.71E-01	3.05E-02	8.40E-02	1.33E-01	2.21E-01	2.24E-02	2.35E-02

by Pathway

Lead	Merganser						Scaup						Hoary Marmot					Bear	
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	6.95E-05	1.11E-04	1.15E-04	2.39E-04	1.10E-04	1.10E-04	8.53E-05	1.36E-04	1.41E-04	2.94E-04	1.35E-04	1.34E-04	3.60E-04	7.82E-04	3.62E-04	3.62E-04	3.62E-04	2.53E-04	5.50E-04
Sediment	4.12E-02	6.55E-02	6.79E-02	1.42E-01	6.52E-02	6.49E-02	2.75E-01	4.39E-01	4.54E-01	9.49E-01	4.37E-01	4.34E-01							
Soil													2.10E-02	4.51E-01	4.17E-01	3.67E+00	1.67E+00	1.61E-02	2.04E-01
Fish	2.29E-02	3.65E-02	3.78E-02	7.90E-02	3.63E-02	3.61E-02												4.04E-03	8.77E-03
Benthic							3.72E-02	5.93E-02	6.14E-02	1.28E-01	5.90E-02	5.87E-02							
Aquatic Veg							5.64E-03	8.99E-03	9.31E-03	1.94E-02	8.95E-03	8.90E-03							
Browse													5.92E-03	2.52E-01	4.13E-02	1.88E+00	1.36E-01	1.04E-03	3.93E-02
Forage																		6.93E-04	3.65E-03
Berries																			
Lichen																			
Hare																			
Moose																		2.04E-04	2.04E-04
Caribou																		1.03E-03	1.03E-03
Ducks																			
Total	6.41E-02	1.02E-01	1.06E-01	2.21E-01	1.02E-01	1.01E-01	3.18E-01	5.07E-01	5.25E-01	1.10E+00	5.05E-01	5.02E-01	2.73E-02	7.04E-01	4.59E-01	5.55E+00	1.81E+00	2.33E-02	2.57E-01

Manganese	Merganser						Scaup						Hoary Marmot					Bear	
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	1.16E-03	7.54E-04	5.51E-04	5.76E-04	3.62E-04	3.71E-04	1.43E-03	9.25E-04	6.76E-04	7.07E-04	4.44E-04	4.55E-04	1.18E-03	1.88E-03	2.46E-03	2.46E-03	2.46E-03	8.31E-04	1.32E-03
Sediment	4.13E-01	2.68E-01	1.96E-01	2.05E-01	1.29E-01	1.32E-01	2.76E+00	1.79E+00	1.31E+00	1.37E+00	8.60E-01	8.83E-01							
Soil													1.82E+00	2.52E+00	7.49E-01	6.69E-01	9.74E-01	1.39E+00	1.80E+00
Fish	1.10E+00	7.17E-01	5.24E-01	5.47E-01	3.44E-01	3.53E-01												3.82E-02	6.08E-02
Benthic							6.22E+00	4.04E+00	2.95E+00	3.08E+00	1.94E+00	1.99E+00							
Aquatic Veg							1.07E-01	6.94E-02	5.07E-02	5.30E-02	3.33E-02	3.42E-02							
Browse													3.64E+01	3.38E+01	3.90E+01	2.58E+01	7.13E+01	6.41E+00	1.46E+01
Forage																		1.07E+00	6.59E-01
Berries																			
Lichen																			
Hare																			
Moose																		1.17E-02	1.17E-02
Caribou																		7.72E-04	7.72E-04
Ducks																			
Total	1.52E+00	9.86E-01	7.20E-01	7.53E-01	4.73E-01	4.85E-01	9.09E+00	5.90E+00	4.31E+00	4.51E+00	2.83E+00	2.90E+00	3.82E+01	3.64E+01	3.97E+01	2.64E+01	7.22E+01	8.93E+00	1.72E+01

Nickel	Merganser						Scaup						Hoary Marmot					Bear	
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	3.52E-05	9.69E-05	1.53E-04	2.55E-04	2.59E-05	2.72E-05	4.32E-05	1.19E-04	1.88E-04	3.13E-04	3.17E-05	3.33E-05	8.44E-05	8.35E-04	3.17E-04	3.17E-04	3.17E-04	5.94E-05	5.87E-04
Sediment	1.18E-02	3.25E-02	5.15E-02	8.57E-02	8.67E-03	9.11E-03	7.91E-02	2.18E-01	3.44E-01	5.74E-01	5.80E-02	6.10E-02							
Soil													1.22E-02	4.38E-02	1.08E-02	2.44E-02	2.09E-02	9.30E-03	2.46E-02
Fish	8.20E-03	2.26E-02	3.57E-02	5.95E-02	6.02E-03	6.32E-03												6.68E-04	6.60E-03
Benthic							1.89E-02	5.19E-02	8.21E-02	1.37E-01	1.38E-02	1.45E-02							
Aquatic Veg							2.86E-04	7.87E-04	1.25E-03	2.07E-03	2.10E-04	2.21E-04							
Browse													4.96E-02	1.44E-01	1.31E-01	9.50E-02	4.58E-01	8.74E-03	2.30E-02
Forage																		4.24E-03	1.82E-02
Berries																			
Lichen																			
Hare																			
Moose																		1.05E-03	1.05E-03
Caribou																		7.85E-05	7.85E-05
Ducks																			
Total	2.01E-02	5.52E-02	8.73E-02	1.45E-01	1.47E-02	1.55E-02	9.83E-02	2.70E-01	4.28E-01	7.13E-01	7.21E-02	7.58E-02	6.19E-02	1.88E-01	1.43E-01	1.20E-01	4.79E-01	2.41E-02	7.41E-02

by Pathway

Lead		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	2.54E-04	8.25E-05	2.66E-04	4.24E-04	4.39E-04	9.17E-04	4.22E-04	4.20E-04	1.94E-04	3.09E-04	3.20E-04	6.68E-04	3.07E-04	3.06E-04	3.63E-04	7.88E-04	3.64E-04
Sediment			1.77E-01	2.83E-01	2.93E-01	6.11E-01	2.81E-01	2.80E-01	3.36E-02	5.35E-02	5.55E-02	1.16E-01	5.33E-02	5.30E-02			
Soil	1.95E+00	1.62E-01													6.66E-03	8.45E-02	8.08E-01
Fish	4.05E-03		2.61E-02	4.16E-02	4.31E-02	9.01E-02	4.14E-02	4.12E-02									
Benthic			5.32E-03	8.48E-03	8.78E-03	1.83E-02	8.44E-03	8.39E-03									
Aquatic Veg			4.44E-03	7.07E-03	7.32E-03	1.53E-02	7.03E-03	6.99E-03									
Browse									8.40E-03	1.34E-02	1.39E-02	2.89E-02	1.33E-02	1.32E-02			
Forage	2.37E-01								2.19E-03	1.42E-01	2.19E-03	1.73E-02	2.19E-03	1.73E-02			
Berries	2.06E-02														1.81E-04	9.50E-04	5.38E-03
Lichen																	
Hare		4.11E-03	1.38E-04	2.24E-02	1.38E-04	2.71E-03	1.38E-04	2.71E-03							3.72E-04	7.33E-03	6.05E-02
Moose	2.04E-04	5.61E-04															
Caribou	1.03E-03	2.83E-03															
Ducks			3.38E-04	5.39E-04	5.58E-04	1.17E-03	5.36E-04	5.33E-04							1.42E-03	3.08E-03	1.42E-03
Total	2.21E+00	1.70E-01	2.14E-01	3.63E-01	3.53E-01	7.40E-01	3.39E-01	3.40E-01	4.44E-02	2.09E-01	7.18E-02	1.63E-01	6.91E-02	8.39E-02	8.99E-03	9.66E-02	8.76E-01

Manganese		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.73E-03	4.13E-04	4.45E-03	2.89E-03	2.11E-03	2.21E-03	1.39E-03	1.42E-03	3.24E-03	2.10E-03	1.54E-03	1.61E-03	1.01E-03	1.04E-03	1.19E-03	1.90E-03	2.48E-03
Sediment			1.78E+00	1.16E+00	8.44E-01	8.82E-01	5.54E-01	5.69E-01	3.37E-01	2.19E-01	1.60E-01	1.67E-01	1.05E-01	1.08E-01			
Soil	1.02E+00	1.78E-01													5.78E-01	7.46E-01	4.24E-01
Fish	7.96E-02		1.26E+00	8.18E-01	5.97E-01	6.25E-01	3.92E-01	4.03E-01									
Benthic			8.90E-01	5.78E-01	4.22E-01	4.41E-01	2.77E-01	2.84E-01									
Aquatic Veg			8.41E-02	5.46E-02	3.98E-02	4.17E-02	2.62E-02	2.69E-02									
Browse									1.59E-01	1.03E-01	7.55E-02	7.89E-02	4.96E-02	5.09E-02			
Forage	8.09E+00								6.29E+00	2.45E+01	6.29E+00	5.80E+00	6.29E+00	5.80E+00			
Berries	7.68E-01														2.80E-01	1.72E-01	2.00E-01
Lichen																	
Hare		2.24E-04	4.68E-04	1.84E-04	4.68E-04	4.67E-04	4.68E-04	4.67E-04							1.26E-03	1.26E-03	4.98E-04
Moose	1.17E-02	3.22E-02															
Caribou	7.72E-04	2.13E-03															
Ducks			2.71E-03	1.76E-03	1.28E-03	1.34E-03	8.44E-04	8.65E-04							2.23E-03	3.54E-03	4.64E-03
Total	9.97E+00	2.13E-01	4.02E+00	2.61E+00	1.91E+00	1.99E+00	1.25E+00	1.29E+00	6.79E+00	2.49E+01	6.53E+00	6.05E+00	6.45E+00	5.96E+00	8.63E-01	9.25E-01	6.31E-01

Nickel		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	2.23E-04	6.50E-05	1.35E-04	3.71E-04	5.87E-04	9.78E-04	9.90E-05	1.04E-04	9.82E-05	2.70E-04	4.28E-04	7.12E-04	7.21E-05	7.57E-05	8.51E-05	8.41E-04	3.19E-04
Sediment			5.10E-02	1.40E-01	2.22E-01	3.70E-01	3.74E-02	3.93E-02	9.65E-03	2.66E-02	4.20E-02	7.00E-02	7.08E-03	7.44E-03			
Soil	1.86E-02	2.46E-03													3.86E-03	1.02E-02	7.71E-03
Fish	2.51E-03		9.36E-03	2.57E-02	4.07E-02	6.78E-02	6.86E-03	7.21E-03									
Benthic			2.70E-03	7.42E-03	1.17E-02	1.96E-02	1.98E-03	2.08E-03									
Aquatic Veg			2.25E-04	6.19E-04	9.79E-04	1.63E-03	1.65E-04	1.73E-04									
Browse									4.26E-04	1.17E-03	1.85E-03	3.09E-03	3.13E-04	3.28E-04			
Forage	1.63E-02								2.42E-02	2.99E-02	2.42E-02	3.30E-02	2.42E-02	3.30E-02			
Berries	5.57E-03														1.10E-03	4.75E-03	1.45E-03
Lichen																	
Hare		1.56E-05	1.87E-05	2.78E-05	1.87E-05	3.19E-05	1.87E-05	3.19E-05							5.07E-05	8.62E-05	7.52E-05
Moose	1.05E-03	2.88E-03															
Caribou	7.85E-05	2.16E-04															
Ducks			1.57E-03	4.33E-03	6.85E-03	1.14E-02	1.15E-03	1.21E-03							3.05E-03	3.01E-02	1.14E-02
Total	4.43E-02	5.64E-03	6.50E-02	1.79E-01	2.83E-01	4.71E-01	4.77E-02	5.01E-02	3.44E-02	5.79E-02	6.85E-02	1.07E-01	3.17E-02	4.09E-02	8.14E-03	4.60E-02	2.10E-02

by Pathway

Silver	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.11E-05	9.29E-06	3.55E-05	9.29E-06	9.29E-06	9.29E-06	1.28E-05	3.77E-05	7.54E-06	2.88E-05	7.54E-06	7.54E-06	7.54E-06	2.87E-06	2.87E-06	2.26E-05	1.10E-05	2.87E-06	8.26E-08
Sediment							4.97E-05							6.93E-05	6.93E-05	5.46E-04	2.65E-04	6.93E-05	1.99E-06
Soil	1.46E-03	4.60E-03	4.07E-03	4.07E-03	9.63E-03	4.07E-03		1.61E-03	4.28E-03	3.79E-03	3.79E-03	8.96E-03	3.79E-03						
Fish																			
Benthic																			
Aquatic Veg							8.48E-04							1.71E-03	1.71E-03	1.35E-02	6.55E-03	1.71E-03	4.93E-05
Browse	3.34E-05	6.10E-04	5.43E-03	5.00E-04	4.14E-03	2.23E-03	6.05E-04		9.87E-04	8.79E-03	8.09E-04	6.70E-03	3.61E-03	2.89E-03	2.89E-03	2.28E-02	1.11E-02	2.89E-03	8.33E-05
Forage	4.05E-06	4.05E-04	1.38E-03	1.20E-03	1.31E-03	5.00E-03		5.05E-04											
Berries									1.64E-04	2.62E-04	4.92E-04	5.14E-05	4.06E-04						
Lichen	3.57E-03																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	5.08E-03	5.62E-03	1.09E-02	5.78E-03	1.51E-02	1.13E-02	1.52E-03	2.16E-03	5.44E-03	1.29E-02	5.10E-03	1.57E-02	7.82E-03	4.68E-03	4.68E-03	3.69E-02	1.79E-02	4.68E-03	1.35E-04

Thallium	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment							n/a							n/a	n/a	n/a	n/a	n/a	n/a
Soil	n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	n/a	n/a	n/a	n/a						
Fish																			
Benthic																			
Aquatic Veg							n/a							n/a	n/a	n/a	n/a	n/a	n/a
Browse	7.82E-06	5.68E-04	7.52E-04	7.52E-04	7.52E-04	7.52E-04	1.42E-04		9.19E-04	1.22E-03	1.22E-03	1.22E-03	1.22E-03	n/a	n/a	n/a	n/a	n/a	n/a
Forage	4.11E-06	3.08E-04	3.72E-04	3.62E-04	3.61E-03	2.44E-04		1.84E-03											
Berries									7.35E-05	6.46E-05	5.57E-05	8.44E-05	7.76E-05						
Lichen	1.59E-03																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	1.60E-03	8.77E-04	1.12E-03	1.11E-03	4.37E-03	9.96E-04	1.42E-04	1.84E-03	9.92E-04	1.28E-03	1.27E-03	1.30E-03	1.29E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Tin	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment							n/a							n/a	n/a	n/a	n/a	n/a	n/a
Soil	3.70E-03	1.02E-02	3.18E-02	1.66E-02	1.28E-02	1.57E-02		1.13E-02	9.47E-03	2.96E-02	1.54E-02	1.19E-02	1.46E-02						
Fish																			
Benthic																			
Aquatic Veg							n/a							n/a	n/a	n/a	n/a	n/a	n/a
Browse	9.98E-05	1.20E-02	2.01E-02	1.05E-02	8.09E-03	3.76E-03	1.81E-03		1.93E-02	3.25E-02	1.69E-02	1.31E-02	6.08E-03	n/a	n/a	n/a	n/a	n/a	n/a
Forage	2.02E-05	8.95E-03	1.86E-03	6.42E-03	1.89E-03	6.61E-03		7.29E-03											
Berries									6.08E-04	3.23E-04	3.09E-02	2.91E-03	3.88E-04						
Lichen	1.85E-02																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	2.23E-02	3.11E-02	5.37E-02	3.34E-02	2.28E-02	2.61E-02	1.81E-03	1.86E-02	2.94E-02	6.24E-02	6.32E-02	2.79E-02	2.11E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

by Pathway

Silver	Merganser						Scaup						Hoary Marmot					Bear	
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	2.59E-06	2.59E-06	2.04E-05	9.89E-06	2.59E-06	7.44E-08	3.17E-06	3.17E-06	2.50E-05	1.21E-05	3.17E-06	9.12E-08	8.44E-06	3.23E-05	8.44E-06	8.44E-06	8.44E-06	5.94E-06	2.27E-05
Sediment	4.49E-05	4.49E-05	3.54E-04	1.72E-04	4.49E-05	1.29E-06	3.00E-04	3.00E-04	2.37E-03	1.15E-03	3.00E-04	8.65E-06							
Soil													2.06E-03	1.82E-03	1.82E-03	4.31E-03	1.82E-03	1.57E-03	1.39E-03
Fish	4.34E-03	4.34E-03	3.42E-02	1.66E-02	4.34E-03	1.25E-04												4.82E-04	1.84E-03
Benthic							2.77E-03	2.77E-03	2.18E-02	1.06E-02	2.77E-03	7.96E-05							
Aquatic Veg							1.40E-03	1.40E-03	1.10E-02	5.35E-03	1.40E-03	4.03E-05							
Browse																			
Forage													8.63E-04	2.95E-03	2.56E-03	2.79E-03	1.07E-02	1.52E-04	4.65E-04
Berries																		1.62E-04	1.37E-04
Lichen																			
Hare																			
Moose																		1.27E-05	1.27E-05
Caribou																		7.43E-06	7.43E-06
Ducks																			
Total	4.38E-03	4.38E-03	3.46E-02	1.68E-02	4.38E-03	1.26E-04	4.47E-03	4.47E-03	3.53E-02	1.71E-02	4.47E-03	1.29E-04	2.93E-03	4.80E-03	4.39E-03	7.10E-03	1.25E-02	2.40E-03	3.88E-03

Thallium	Merganser						Scaup						Hoary Marmot					Bear	
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Soil													n/a	n/a	n/a	n/a	n/a	n/a	n/a
Fish	n/a	n/a	n/a	n/a	n/a	n/a													
Benthic							n/a	n/a	n/a	n/a	n/a	n/a							
Aquatic Veg							n/a	n/a	n/a	n/a	n/a	n/a							
Browse																			
Forage													6.58E-04	7.94E-04	7.72E-04	7.71E-03	5.20E-04	1.16E-04	2.13E-04
Berries																		7.27E-05	1.27E-04
Lichen																			
Hare																			
Moose																		1.18E-05	1.18E-05
Caribou																		2.34E-05	2.34E-05
Ducks																			
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.58E-04	7.94E-04	7.72E-04	7.71E-03	5.20E-04	2.24E-04	3.75E-04

Tin	Merganser						Scaup						Hoary Marmot					Bear	
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a							
Soil													4.56E-03	1.42E-02	7.41E-03	5.73E-03	7.04E-03	3.48E-03	7.00E-03
Fish	n/a	n/a	n/a	n/a	n/a	n/a												n/a	n/a
Benthic							n/a	n/a	n/a	n/a	n/a	n/a							
Aquatic Veg							n/a	n/a	n/a	n/a	n/a	n/a							
Browse																			
Forage													1.91E-02	3.97E-03	1.37E-02	4.03E-03	1.41E-02	3.37E-03	1.06E-03
Berries																		6.01E-04	6.36E-04
Lichen																			
Hare																			
Moose																		1.51E-04	1.51E-04
Caribou																		3.26E-04	3.26E-04
Ducks																			
Total	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.37E-02	1.82E-02	2.11E-02	9.76E-03	2.12E-02	7.93E-03	9.17E-03

by Pathway

Silver		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	5.94E-06	4.17E-06	9.90E-06	9.90E-06	7.81E-05	3.79E-05	9.90E-06	2.85E-07	7.21E-06	7.21E-06	5.69E-05	2.76E-05	7.21E-06	2.07E-07	8.51E-06	3.25E-05	8.51E-06
Sediment			1.94E-04	1.94E-04	1.53E-03	7.40E-04	1.94E-04	5.57E-06	3.67E-05	3.67E-05	2.89E-04	1.40E-04	3.67E-05	1.06E-06			
Soil	2.59E-03	3.44E-04													6.53E-04	5.78E-04	1.07E-03
Fish	4.82E-04		4.95E-03	4.95E-03	3.90E-02	1.89E-02	4.95E-03	1.42E-04									
Benthic			3.96E-04	3.96E-04	3.12E-03	1.51E-03	3.96E-04	1.14E-05									
Aquatic Veg			1.10E-03	1.10E-03	8.68E-03	4.21E-03	1.10E-03	3.17E-05	2.08E-03	2.08E-03	1.64E-02	7.97E-03	2.08E-03	6.00E-05			
Browse									9.69E-05	4.97E-04	9.69E-05	6.84E-04	9.69E-05	6.84E-04			
Forage	3.64E-04																
Berries	4.60E-05														4.22E-05	3.56E-05	1.20E-05
Lichen																	
Hare		2.49E-07	2.60E-07	6.97E-07	2.60E-07	5.05E-07	2.60E-07	5.05E-07							7.02E-07	1.36E-06	1.88E-06
Moose	1.27E-05	3.49E-05															
Caribou	7.43E-06	2.05E-05															
Ducks			1.11E-04	1.11E-04	8.77E-04	4.25E-04	1.11E-04	3.20E-06							2.93E-04	1.12E-03	2.93E-04
Total	3.51E-03	4.03E-04	6.76E-03	6.76E-03	5.33E-02	2.58E-02	6.76E-03	1.95E-04	2.22E-03	2.62E-03	1.69E-02	8.82E-03	2.22E-03	7.45E-04	9.98E-04	1.77E-03	1.39E-03

Thallium		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
Soil	n/a	n/a													n/a	n/a	n/a
Fish	n/a		n/a	n/a	n/a	n/a	n/a	n/a									
Benthic			n/a	n/a	n/a	n/a	n/a	n/a									
Aquatic Veg			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
Browse									9.02E-05	9.29E-05	9.02E-05	1.19E-04	9.02E-05	1.19E-04			
Forage	1.10E-03																
Berries	7.55E-05														1.89E-05	3.32E-05	1.97E-05
Lichen																	
Hare		4.33E-07	4.05E-07	2.02E-06	4.05E-07	5.19E-07	4.05E-07	5.19E-07							1.09E-06	1.40E-06	5.45E-06
Moose	1.18E-05	3.26E-05															
Caribou	2.34E-05	6.44E-05															
Ducks			n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a
Total	1.21E-03	9.75E-05	4.05E-07	2.02E-06	4.05E-07	5.19E-07	4.05E-07	5.19E-07	9.02E-05	9.29E-05	9.02E-05	1.19E-04	9.02E-05	1.19E-04	2.00E-05	3.46E-05	2.51E-05

Tin		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Sediment			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
Soil	4.99E-03	8.70E-04													1.44E-03	2.90E-03	2.07E-03
Fish	n/a		n/a	n/a	n/a	n/a	n/a	n/a									
Benthic			n/a	n/a	n/a	n/a	n/a	n/a									
Aquatic Veg			n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a			
Browse									1.90E-03	4.79E-03	1.90E-03	2.05E-03	1.90E-03	2.05E-03			
Forage	8.08E-04																
Berries	1.53E-03														1.57E-04	1.66E-04	3.98E-04
Lichen																	
Hare		8.53E-06	1.44E-05	1.05E-05	1.44E-05	2.48E-05	1.44E-05	2.48E-05							3.88E-05	6.71E-05	2.84E-05
Moose	1.51E-04	4.16E-04															
Caribou	3.26E-04	8.99E-04															
Ducks			n/a	n/a	n/a	n/a	n/a	n/a							n/a	n/a	n/a
Total	7.81E-03	2.19E-03	1.44E-05	1.05E-05	1.44E-05	2.48E-05	1.44E-05	2.48E-05	1.90E-03	4.79E-03	1.90E-03	2.05E-03	1.90E-03	2.05E-03	1.64E-03	3.13E-03	2.50E-03

by Pathway

Zinc	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	1.06E-03	7.77E-04	2.84E-03	2.68E-03	2.68E-03	2.68E-03	1.23E-03	1.61E-03	6.30E-04	2.30E-03	2.17E-03	2.17E-03	2.17E-03	1.29E-03	8.28E-04	5.62E-04	8.77E-04	2.40E-04	2.54E-04
Sediment							4.28E-02							2.80E-01	1.79E-01	1.22E-01	1.90E-01	5.20E-02	5.51E-02
Soil	5.63E-01	6.50E-01	1.83E+00	1.00E+00	5.02E+00	2.99E+00		2.73E-01	6.05E-01	1.70E+00	9.35E-01	4.68E+00	2.78E+00						
Fish																			
Benthic														1.04E+01	6.64E+00	4.50E+00	7.04E+00	1.93E+00	2.04E+00
Aquatic Veg							1.06E-01							1.69E+00	1.08E+00	7.36E-01	1.15E+00	3.15E-01	3.33E-01
Browse	2.66E-01	1.25E+01	8.38E+00	9.45E+00	3.23E+01	2.57E+01	4.82E+00		2.03E+01	1.35E+01	1.53E+01	5.23E+01	4.16E+01						
Forage	1.30E-02	1.44E+00	1.30E+01	2.00E+00	4.61E+00	2.48E+00		1.49E+00	9.39E-02	1.48E-01	8.12E-02	2.44E-01	2.49E-01						
Berries																			
Lichen	2.13E+00																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	2.97E+00	1.46E+01	2.32E+01	1.25E+01	4.20E+01	3.12E+01	4.97E+00	1.76E+00	2.10E+01	1.54E+01	1.63E+01	5.72E+01	4.46E+01	1.23E+01	7.90E+00	5.36E+00	8.38E+00	2.29E+00	2.43E+00

by Pathway

Zinc	Merganser						Scaup						Hoary Marmot					Bear	
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Bkgd	Van-M
Water	1.16E-03	7.45E-04	5.06E-04	7.90E-04	2.16E-04	2.29E-04	1.43E-03	9.14E-04	6.21E-04	9.69E-04	2.65E-04	2.81E-04	7.06E-04	2.58E-03	2.44E-03	2.44E-03	2.44E-03	4.97E-04	1.81E-03
Sediment	1.81E-01	1.16E-01	7.89E-02	1.23E-01	3.37E-02	3.57E-02	1.21E+00	7.78E-01	5.28E-01	8.24E-01	2.26E-01	2.39E-01							
Soil													2.91E-01	8.19E-01	4.50E-01	2.25E+00	1.34E+00	2.23E-01	4.56E-01
Fish	6.06E+00	3.89E+00	2.64E+00	4.12E+00	1.13E+00	1.19E+00												1.25E-01	4.57E-01
Benthic							1.67E+01	1.07E+01	7.28E+00	1.14E+01	3.11E+00	3.29E+00							
Aquatic Veg							8.19E-01	5.25E-01	3.56E-01	5.56E-01	1.52E-01	1.61E-01							
Browse																			
Forage													3.07E+00	2.77E+01	4.27E+00	9.84E+00	5.29E+00	5.42E-01	4.26E+00
Berries																		9.28E-02	1.66E-01
Lichen																			
Hare																			
Moose																		1.38E+00	1.38E+00
Caribou																		1.45E-01	1.45E-01
Ducks																			
Total	6.25E+00	4.00E+00	2.72E+00	4.24E+00	1.16E+00	1.23E+00	1.88E+01	1.20E+01	8.16E+00	1.27E+01	3.49E+00	3.69E+00	3.36E+00	2.86E+01	4.72E+00	1.21E+01	6.63E+00	2.51E+00	6.87E+00

by Pathway

Zinc		Wolf	Mink						Beaver						Fox		
Pathway	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.71E-03	3.99E-04	4.46E-03	2.86E-03	1.94E-03	3.03E-03	8.28E-04	8.77E-04	3.24E-03	2.08E-03	1.41E-03	2.20E-03	6.03E-04	6.38E-04	7.12E-04	2.60E-03	2.45E-03
Sediment			7.82E-01	5.01E-01	3.40E-01	5.31E-01	1.45E-01	1.54E-01	1.48E-01	9.49E-02	6.44E-02	1.01E-01	2.75E-02	2.91E-02			
Soil	1.31E+00	1.32E-01													9.23E-02	1.89E-01	5.44E-01
Fish	4.32E-01		6.92E+00	4.43E+00	3.01E+00	4.70E+00	1.29E+00	1.36E+00									
Benthic			2.39E+00	1.53E+00	1.04E+00	1.63E+00	4.45E-01	4.71E-01									
Aquatic Veg			6.44E-01	4.12E-01	2.80E-01	4.37E-01	1.20E-01	1.27E-01	1.22E+00	7.81E-01	5.30E-01	8.28E-01	2.27E-01	2.40E-01			
Browse									1.99E+00	3.84E+00	1.99E+00	2.83E+00	1.99E+00	2.83E+00			
Forage	1.38E+00																
Berries	2.03E-01														2.42E-02	4.32E-02	5.29E-02
Lichen																	
Hare		2.10E-02	2.25E-02	6.46E-02	2.25E-02	3.57E-02	2.25E-02	3.57E-02							6.08E-02	9.65E-02	1.75E-01
Moose	1.38E+00	3.82E+00															
Caribou	1.45E-01	3.99E-01															
Ducks			9.73E-01	6.23E-01	4.23E-01	6.61E-01	1.81E-01	1.91E-01							4.77E-01	1.74E+00	1.64E+00
Total	4.85E+00	4.37E+00	1.17E+01	7.57E+00	5.12E+00	7.99E+00	2.20E+00	2.34E+00	3.36E+00	4.72E+00	2.59E+00	3.76E+00	2.24E+00	3.10E+00	6.55E-01	2.07E+00	2.42E+00

Pct by Pathway

Percent Intake by Pathway

Arsenic	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.26%	0.16%	0.37%	0.30%	0.06%	0.11%	0.63%	2.75%	0.09%	0.30%	0.19%	0.04%	0.08%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
Sediment							25.23%							4.68%	4.68%	4.68%	4.68%	4.68%	4.68%
Soil	26.30%	22.34%	57.86%	39.45%	39.42%	67.24%		7.32%	15.44%	53.38%	28.76%	31.42%	59.64%						
Fish																			
Benthic														95.20%	95.20%	95.20%	95.20%	95.20%	95.20%
Aquatic Veg							0.21%							0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
Browse	1.97%	67.51%	25.44%	55.69%	48.49%	25.93%	73.93%		81.08%	40.78%	70.56%	67.16%	39.97%						
Forage	0.13%	9.99%	16.33%	4.56%	12.03%	6.72%		89.93%											
Berries									3.38%	5.54%	0.49%	1.37%	0.30%						
Lichen	71.34%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.27%	0.02%	0.07%	0.10%	0.03%	0.02%	0.03%	1.44%	0.01%	0.03%	0.07%	0.01%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Sediment							0.57%							0.33%	0.33%	0.33%	0.33%	0.33%	0.33%
Soil	22.27%	3.54%	2.48%	25.97%	4.30%	2.51%		22.32%	2.15%	1.48%	21.56%	2.58%	1.50%						
Fish																			
Benthic														38.26%	38.26%	38.26%	38.26%	38.26%	38.26%
Aquatic Veg							43.01%							61.40%	61.40%	61.40%	61.40%	61.40%	61.40%
Browse	28.34%	92.59%	94.61%	53.57%	92.90%	94.30%	56.39%		97.69%	97.87%	77.30%	97.07%	97.75%						
Forage	0.24%	3.85%	2.83%	20.36%	2.78%	3.17%		76.25%											
Berries									0.16%	0.62%	1.06%	0.33%	0.74%						
Lichen	48.88%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.19%	0.11%	0.23%	0.08%	0.05%	0.06%	0.21%	0.24%	0.08%	0.16%	0.06%	0.04%	0.05%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
Sediment							45.74%							30.45%	30.45%	30.45%	30.45%	30.45%	30.45%
Soil	34.75%	13.70%	25.29%	25.77%	46.90%	35.42%		4.44%	12.08%	19.62%	21.31%	40.52%	29.21%						
Fish																			
Benthic														66.28%	66.28%	66.28%	66.28%	66.28%	66.28%
Aquatic Veg							1.99%							3.25%	3.25%	3.25%	3.25%	3.25%	3.25%
Browse	2.99%	53.44%	52.98%	45.19%	36.64%	43.78%	52.06%		81.92%	71.42%	64.94%	55.00%	62.73%						
Forage	0.44%	32.76%	21.49%	28.95%	16.41%	20.73%		95.32%											
Berries									5.91%	8.80%	13.68%	4.45%	8.01%						
Lichen	61.63%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Percent Intake by Pat

Arsenic	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.45%	0.55%	0.98%	0.13%	0.22%
Sediment	37.32%	37.32%	37.32%	37.32%	37.32%	37.32%	11.66%	11.66%	11.66%	11.66%	11.66%	11.66%					
Soil													31.79%	42.39%	63.82%	40.66%	67.57%
Fish	62.47%	62.47%	62.47%	62.47%	62.47%	62.47%											
Benthic							88.30%	88.30%	88.30%	88.30%	88.30%	88.30%					
Aquatic Veg							0.03%	0.03%	0.03%	0.03%	0.03%	0.03%					
Browse																	
Forage													67.76%	57.07%	35.20%	59.20%	32.21%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.15%	0.85%	0.17%	0.31%	0.25%
Sediment	6.62%	6.62%	6.62%	6.62%	6.62%	6.62%	1.54%	1.54%	1.54%	1.54%	1.54%	1.54%					
Soil													16.11%	15.40%	21.06%	24.41%	14.20%
Fish	93.29%	93.29%	93.29%	93.29%	93.29%	93.29%											
Benthic							66.51%	66.51%	66.51%	66.51%	66.51%	66.51%					
Aquatic Veg							31.95%	31.95%	31.95%	31.95%	31.95%	31.95%					
Browse																	
Forage													83.74%	83.76%	78.77%	75.28%	85.55%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.13%	0.37%	0.10%	0.08%	0.10%
Sediment	22.98%	22.98%	22.98%	22.98%	22.98%	22.98%	54.87%	54.87%	54.87%	54.87%	54.87%	54.87%					
Soil													8.05%	19.72%	15.72%	37.44%	26.35%
Fish	77.00%	77.00%	77.00%	77.00%	77.00%	77.00%											
Benthic							44.47%	44.47%	44.47%	44.47%	44.47%	44.47%					
Aquatic Veg							0.65%	0.65%	0.65%	0.65%	0.65%	0.65%					
Browse																	
Forage													91.82%	79.91%	84.18%	62.48%	73.55%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Percent Intake by Pat

Arsenic	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.56%	0.97%	0.26%	1.35%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%	0.98%	0.60%	1.56%	1.45%	0.70%	0.68%	1.30%	1.57%	0.82%
Sediment					31.20%	31.19%	31.20%	31.20%	31.20%	31.19%	51.45%	31.51%	81.86%	76.04%	36.73%	35.70%			
Soil	42.81%	51.46%	63.40%	84.74%													28.68%	24.03%	56.96%
Fish	8.15%	14.13%	3.85%		13.82%	13.81%	13.82%	13.82%	13.82%	13.81%									
Benthic					52.45%	52.45%	52.45%	52.45%	52.45%	52.45%									
Aquatic Veg					0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	1.41%	0.87%	2.25%	2.09%	1.01%	0.98%			
Browse											46.16%	67.03%	14.34%	20.42%	61.56%	62.65%			
Forage	21.02%	23.87%	24.06%																
Berries	25.20%	8.99%	8.00%														10.61%	2.64%	4.52%
Lichen																			
Hare				0.06%	0.00%	0.01%	0.00%	0.00%	0.00%	0.01%							0.08%	0.04%	0.12%
Moose	1.65%	0.42%	0.31%	10.16%															
Caribou	0.60%	0.15%	0.11%	3.68%															
Ducks					2.30%	2.30%	2.30%	2.30%	2.30%	2.30%							59.34%	71.72%	37.58%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Cadmium	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.30%	0.90%	0.49%	0.92%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	0.01%	0.02%	0.01%	0.02%	0.01%	0.01%	0.18%	0.21%	0.29%
Sediment					2.46%	2.44%	2.45%	2.41%	2.40%	2.40%	0.29%	0.35%	0.31%	0.35%	0.32%	0.28%			
Soil	34.41%	24.53%	33.95%	47.25%													6.15%	1.66%	5.84%
Fish	14.97%	45.52%	24.83%		9.17%	9.11%	9.12%	8.98%	8.95%	8.95%									
Benthic					23.62%	23.47%	23.49%	23.14%	23.05%	23.05%									
Aquatic Veg					62.33%	61.93%	62.00%	61.08%	60.82%	60.83%	73.17%	88.90%	78.91%	87.42%	82.29%	69.73%			
Browse											26.53%	10.73%	20.76%	12.22%	17.37%	29.99%			
Forage	41.20%	19.84%	25.74%																
Berries	6.83%	6.94%	12.38%														0.77%	0.30%	1.34%
Lichen																			
Hare				0.22%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%							0.04%	0.02%	0.09%
Moose	1.97%	1.94%	2.23%	44.18%															
Caribou	0.33%	0.33%	0.37%	7.44%															
Ducks					2.39%	3.02%	2.91%	4.36%	4.75%	4.73%							92.86%	97.81%	92.45%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Copper	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.20%	0.30%	0.12%	0.40%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.15%	0.21%	0.18%	0.26%	0.23%	0.20%	1.45%	1.75%	0.59%
Sediment					47.81%	47.81%	47.81%	47.82%	47.81%	47.81%	42.07%	60.99%	53.27%	74.10%	66.68%	58.28%			
Soil	13.29%	13.15%	43.36%	46.42%													28.50%	22.04%	64.67%
Fish	31.21%	48.21%	18.41%		42.39%	42.39%	42.39%	42.39%	42.39%	42.39%									
Benthic					8.61%	8.61%	8.61%	8.61%	8.61%	8.61%									
Aquatic Veg					0.69%	0.69%	0.69%	0.69%	0.69%	0.69%	6.10%	8.84%	7.72%	10.74%	9.67%	8.45%			
Browse											51.68%	29.95%	38.82%	14.90%	23.42%	33.07%			
Forage	34.93%	17.31%	19.87%																
Berries	17.47%	19.44%	16.36%														23.55%	20.48%	15.35%
Lichen																			
Hare				0.22%	0.02%	0.01%	0.01%	0.00%	0.01%	0.01%							0.61%	0.34%	0.55%
Moose	2.49%	1.37%	1.61%	45.33%															
Caribou	0.42%	0.23%	0.27%	7.63%															
Ducks					0.44%	0.44%	0.44%	0.44%	0.44%	0.44%							45.90%	55.39%	18.84%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.01%	0.62%	0.07%	0.02%	0.00%	0.01%	0.14%	1.06%	0.48%	0.06%	0.02%	0.00%	0.01%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
Sediment							18.35%							64.61%	64.61%	64.61%	64.61%	64.61%	64.61%
Soil	32.73%	73.41%	80.05%	56.09%	78.85%	96.70%		70.06%	65.13%	80.73%	42.86%	77.96%	97.03%						
Fish																			
Benthic														23.44%	23.44%	23.44%	23.44%	23.44%	23.44%
Aquatic Veg							1.38%							11.88%	11.88%	11.88%	11.88%	11.88%	11.88%
Browse	0.38%	21.63%	10.49%	42.72%	12.68%	1.64%	80.13%		33.35%	18.37%	56.73%	21.78%	2.85%						
Forage	0.05%	4.34%	9.39%	1.17%	8.46%	1.66%		28.88%											
Berries									1.05%	0.84%	0.39%	0.25%	0.11%						
Lichen	66.82%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.03%	0.00%	0.00%	0.01%	0.01%	0.00%	0.02%	0.01%	0.00%	0.00%	0.01%	0.01%	0.00%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
Sediment							1.20%							13.52%	13.52%	13.52%	13.52%	13.52%	13.52%
Soil	23.92%	6.71%	9.29%	5.30%	6.24%	2.51%		5.72%	5.50%	7.61%	6.56%	7.31%	2.35%						
Fish																			
Benthic														81.75%	81.75%	81.75%	81.75%	81.75%	81.75%
Aquatic Veg							0.17%							4.70%	4.70%	4.70%	4.70%	4.70%	4.70%
Browse	14.41%	65.23%	64.56%	36.85%	43.33%	58.91%	98.61%		92.93%	91.91%	79.24%	88.19%	95.84%						
Forage	1.98%	28.06%	26.14%	57.84%	50.42%	38.58%		94.28%											
Berries									1.58%	0.47%	14.19%	4.49%	1.81%						
Lichen	59.65%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.65%	0.05%	0.27%	0.30%	0.12%	0.06%	0.32%	0.52%	0.03%	0.19%	0.36%	0.07%	0.05%	0.13%	0.13%	0.13%	0.13%	0.13%	0.13%
Sediment							23.93%							59.71%	59.71%	59.71%	59.71%	59.71%	59.71%
Soil	38.96%	13.39%	28.35%	20.87%	18.09%	8.22%		1.66%	9.16%	23.32%	29.08%	13.26%	7.59%						
Fish																			
Benthic														38.22%	38.22%	38.22%	38.22%	38.22%	38.22%
Aquatic Veg							0.32%							1.94%	1.94%	1.94%	1.94%	1.94%	1.94%
Browse	9.70%	75.11%	51.90%	25.83%	67.01%	53.88%	75.43%		89.26%	74.20%	62.56%	85.34%	86.41%						
Forage	0.84%	11.46%	19.49%	53.00%	14.78%	37.83%		97.82%											
Berries									1.55%	2.28%	8.00%	1.33%	5.95%						
Lichen	49.85%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%	1.32%	0.11%	0.08%	0.01%	0.02%
Sediment	64.16%	64.16%	64.16%	64.16%	64.16%	64.16%	86.51%	86.51%	86.51%	86.51%	86.51%	86.51%					
Soil													76.97%	64.05%	90.91%	66.14%	92.43%
Fish	35.73%	35.73%	35.73%	35.73%	35.73%	35.73%											
Benthic							11.69%	11.69%	11.69%	11.69%	11.69%	11.69%					
Aquatic Veg							1.77%	1.77%	1.77%	1.77%	1.77%	1.77%					
Browse																	
Forage													21.71%	35.84%	9.01%	33.85%	7.55%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.00%	0.01%	0.01%	0.01%	0.00%
Sediment	27.19%	27.19%	27.19%	27.19%	27.19%	27.19%	30.39%	30.39%	30.39%	30.39%	30.39%	30.39%					
Soil													4.77%	6.94%	1.89%	2.53%	1.35%
Fish	72.73%	72.73%	72.73%	72.73%	72.73%	72.73%											
Benthic							68.42%	68.42%	68.42%	68.42%	68.42%	68.42%					
Aquatic Veg							1.18%	1.18%	1.18%	1.18%	1.18%	1.18%					
Browse																	
Forage													95.23%	93.06%	98.11%	97.46%	98.65%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.18%	0.18%	0.18%	0.18%	0.18%	0.18%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.14%	0.44%	0.22%	0.26%	0.07%
Sediment	58.94%	58.94%	58.94%	58.94%	58.94%	58.94%	80.48%	80.48%	80.48%	80.48%	80.48%	80.48%					
Soil													19.66%	23.27%	7.61%	20.37%	4.36%
Fish	40.89%	40.89%	40.89%	40.89%	40.89%	40.89%											
Benthic							19.19%	19.19%	19.19%	19.19%	19.19%	19.19%					
Aquatic Veg							0.29%	0.29%	0.29%	0.29%	0.29%	0.29%					
Browse																	
Forage													80.20%	76.29%	92.17%	79.37%	95.58%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Lead	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	1.09%	0.21%	0.01%	0.05%	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%	0.44%	0.15%	0.45%	0.41%	0.44%	0.36%	4.04%	0.82%	0.04%
Sediment					82.88%	77.82%	82.90%	82.63%	82.90%	82.27%	75.70%	25.60%	77.20%	71.14%	77.10%	63.16%			
Soil	68.88%	79.20%	88.11%	95.54%													74.06%	87.43%	92.27%
Fish	17.31%	3.41%	0.18%		12.21%	11.47%	12.21%	12.17%	12.21%	12.12%									
Benthic					2.49%	2.33%	2.49%	2.48%	2.49%	2.47%									
Aquatic Veg					2.07%	1.95%	2.07%	2.07%	2.07%	2.06%	18.92%	6.40%	19.30%	17.79%	19.28%	15.79%			
Browse											4.94%	67.85%	3.06%	10.66%	3.18%	20.68%			
Forage	4.48%	15.28%	10.70%																
Berries	2.97%	1.42%	0.93%														2.01%	0.98%	0.61%
Lichen																			
Hare				2.42%	0.06%	6.17%	0.04%	0.37%	0.04%	0.80%							4.14%	7.59%	6.92%
Moose	0.87%	0.08%	0.01%	0.33%															
Caribou	4.41%	0.40%	0.05%	1.67%															
Ducks					0.16%	0.15%	0.16%	0.16%	0.16%	0.16%							15.75%	3.18%	0.16%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Manganese	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.01%	0.01%	0.02%	0.19%	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%	0.05%	0.01%	0.02%	0.03%	0.02%	0.02%	0.14%	0.21%	0.39%
Sediment					44.26%	44.26%	44.26%	44.26%	44.25%	44.25%	4.96%	0.88%	2.45%	2.76%	1.63%	1.81%			
Soil	15.61%	10.49%	10.25%	83.60%													67.02%	80.70%	67.09%
Fish	0.43%	0.35%	0.80%		31.33%	31.33%	31.32%	31.32%	31.32%	31.32%									
Benthic					22.13%	22.13%	22.13%	22.13%	22.13%	22.13%									
Aquatic Veg					2.09%	2.09%	2.09%	2.09%	2.09%	2.09%									
Browse											2.34%	0.42%	1.16%	1.30%	0.77%	0.85%			
Forage	71.79%	85.23%	81.11%								92.64%	98.70%	96.37%	95.91%	97.59%	97.32%			
Berries	12.02%	3.84%	7.70%														32.44%	18.58%	31.70%
Lichen																			
Hare				0.11%	0.01%	0.01%	0.02%	0.02%	0.04%	0.04%							0.15%	0.14%	0.08%
Moose	0.13%	0.07%	0.12%	15.10%															
Caribou	0.01%	0.00%	0.01%	1.00%															
Ducks					0.07%	0.07%	0.07%	0.07%	0.07%	0.07%							0.26%	0.38%	0.73%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Nickel	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.25%	0.79%	0.50%	1.15%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%	0.29%	0.47%	0.62%	0.67%	0.23%	0.19%	1.05%	1.83%	1.52%
Sediment					78.45%	78.46%	78.46%	78.46%	78.44%	78.42%	28.08%	45.89%	61.35%	65.53%	22.37%	18.21%			
Soil	38.55%	33.16%	41.93%	43.62%													47.35%	22.17%	36.74%
Fish	2.77%	8.91%	5.65%		14.40%	14.40%	14.40%	14.40%	14.40%	14.39%									
Benthic					4.15%	4.15%	4.15%	4.15%	4.15%	4.15%									
Aquatic Veg					0.35%	0.35%	0.35%	0.35%	0.35%	0.35%	1.24%	2.02%	2.71%	2.89%	0.99%	0.80%			
Browse											70.39%	51.62%	35.32%	30.91%	76.42%	80.80%			
Forage	36.23%	31.05%	36.81%																
Berries	17.56%	24.58%	12.57%														13.56%	10.33%	6.92%
Lichen																			
Hare				0.28%	0.03%	0.02%	0.01%	0.01%	0.04%	0.06%							0.62%	0.19%	0.36%
Moose	4.33%	1.41%	2.36%	51.11%															
Caribou	0.33%	0.11%	0.18%	3.84%															
Ducks					2.42%	2.42%	2.42%	2.42%	2.42%	2.42%							37.42%	65.49%	54.46%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Silver	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.22%	0.17%	0.33%	0.16%	0.06%	0.08%	0.85%	1.75%	0.14%	0.22%	0.15%	0.05%	0.10%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%
Sediment							3.28%							1.48%	1.48%	1.48%	1.48%	1.48%	1.48%
Soil	28.78%	81.79%	37.28%	70.41%	63.82%	35.98%		74.82%	78.70%	29.45%	74.34%	57.01%	48.48%						
Fish																			
Benthic																			
Aquatic Veg							55.94%							36.61%	36.61%	36.61%	36.61%	36.61%	36.61%
Browse	0.66%	10.85%	49.75%	8.65%	27.45%	19.74%	39.93%		18.15%	68.29%	15.87%	42.61%	46.22%	61.85%	61.85%	61.85%	61.85%	61.85%	61.85%
Forage	0.08%	7.19%	12.65%	20.78%	8.66%	44.20%		23.43%											
Berries									3.01%	2.04%	9.64%	0.33%	5.20%						
Lichen	70.26%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.49%	64.82%	66.90%	67.54%	17.23%	75.52%	100.00%	100.00%	92.59%	94.96%	95.62%	93.51%	94.00%						
Sediment																			
Soil																			
Fish																			
Benthic																			
Aquatic Veg																			
Browse																			
Forage																			
Berries																			
Lichen																			
Hare	99.25%																		
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	n/a	n/a	n/a	n/a	n/a	n/a

Tin	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	16.58%	32.74%	59.17%	49.51%	56.21%	60.26%	100.00%	60.77%	32.20%	47.43%	24.38%	42.70%	69.35%						
Sediment																			
Soil																			
Fish																			
Benthic																			
Aquatic Veg	0.45%	38.46%	37.37%	31.27%	35.50%	14.41%	100.00%	39.23%	65.73%	52.05%	26.75%	46.86%	28.81%						
Browse																			
Forage																			
Berries																			
Lichen																			
Hare	82.88%	28.80%	3.46%	19.21%	8.30%	25.33%	100.00%	39.23%	2.07%	0.52%	48.87%	10.44%	1.84%						
Moose																			
Caribou																			
Ducks																			
Total																			
	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	n/a	n/a	n/a	n/a	n/a	n/a

Pct by Pathway

Silver	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%	0.29%	0.67%	0.19%	0.12%	0.07%
Sediment	1.02%	1.02%	1.02%	1.02%	1.02%	1.02%	6.72%	6.72%	6.72%	6.72%	6.72%	6.72%					
Soil													70.25%	37.93%	41.47%	60.64%	14.57%
Fish	98.92%	98.92%	98.92%	98.92%	98.92%	98.92%											
Benthic							61.91%	61.91%	61.91%	61.91%	61.91%	61.91%					
Aquatic Veg							31.30%	31.30%	31.30%	31.30%	31.30%	31.30%					
Browse																	
Forage													29.46%	61.40%	58.34%	39.25%	85.36%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water																	
Sediment																	
Soil																	
Fish																	
Benthic																	
Aquatic Veg																	
Browse																	
Forage													100.00%	100.00%	100.00%	100.00%	100.00%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100.00%	100.00%	100.00%	100.00%	100.00%

Tin	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water																	
Sediment													19.25%	78.18%	35.08%	58.69%	33.28%
Soil																	
Fish																	
Benthic																	
Aquatic Veg																	
Browse																	
Forage													80.75%	21.82%	64.92%	41.31%	66.72%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Silver	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.25%	0.59%	0.17%	1.03%	0.15%	0.15%	0.15%	0.15%	0.15%	0.15%	0.32%	0.27%	0.34%	0.31%	0.32%	0.03%	0.85%	1.84%	0.61%
Sediment					2.86%	2.86%	2.86%	2.86%	2.86%	2.86%	1.65%	1.40%	1.71%	1.59%	1.65%	0.14%			
Soil	65.71%	35.92%	73.83%	85.18%													65.43%	32.65%	77.26%
Fish	20.10%	47.48%	13.74%		73.21%	73.20%	73.21%	73.21%	73.21%	73.02%									
Benthic					5.86%	5.86%	5.86%	5.86%	5.86%	5.84%									
Aquatic Veg					16.28%	16.27%	16.28%	16.28%	16.28%	16.23%	93.67%	79.39%	97.38%	90.34%	93.67%	8.05%			
Browse											4.36%	18.93%	0.57%	7.75%	4.36%	91.78%			
Forage	6.35%	11.98%	10.38%																
Berries	6.75%	3.52%	1.31%														4.23%	2.01%	0.86%
Lichen																			
Hare				0.06%	0.00%	0.01%	0.00%	0.00%	0.00%	0.26%							0.07%	0.08%	0.14%
Moose	0.53%	0.33%	0.36%	8.65%															
Caribou	0.31%	0.19%	0.21%	5.07%															
Ducks					1.65%	1.65%	1.65%	1.65%	1.65%	1.64%							29.42%	63.42%	21.12%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Thallium	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water																			
Sediment																			
Soil																			
Fish																			
Benthic																			
Aquatic Veg																			
Browse											100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			
Forage	51.82%	56.71%	90.84%																
Berries	32.46%	33.91%	6.25%														94.54%	95.94%	78.31%
Lichen																			
Hare				0.44%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%							5.46%	4.06%	21.69%
Moose	5.29%	3.15%	0.98%	33.46%															
Caribou	10.44%	6.23%	1.93%	66.09%															
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Tin	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water																			
Sediment																			
Soil	43.94%	76.27%	63.96%	39.65%													88.09%	92.57%	82.91%
Fish																			
Benthic																			
Aquatic Veg																			
Browse											100.00%	100.00%	100.00%	100.00%	100.00%	100.00%			
Forage	42.47%	11.60%	10.35%																
Berries	7.57%	6.93%	19.57%														9.54%	5.29%	15.95%
Lichen																			
Hare				0.39%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%							2.37%	2.14%	1.14%
Moose	1.90%	1.65%	1.93%	18.97%															
Caribou	4.11%	3.56%	4.18%	40.99%															
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Caribou	Hare					Moose	Sheep	Grouse					Mallard					
Pathway	Overall	Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Overall		Bkgd	Van-S	Faro-N	Faro-S	Faro-W	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing
Water	0.04%	0.01%	0.01%	0.02%	0.01%	0.01%	0.02%	0.09%	0.00%	0.01%	0.01%	0.00%	0.00%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
Sediment							0.86%							2.27%	2.27%	2.27%	2.27%	2.27%	2.27%
Soil	18.95%	4.45%	7.89%	8.06%	11.98%	9.59%		15.47%	2.89%	11.07%	5.73%	8.18%	6.24%						
Fish																			
Benthic							2.12%							83.99%	83.99%	83.99%	83.99%	83.99%	83.99%
Aquatic Veg							96.99%							13.73%	13.73%	13.73%	13.73%	13.73%	13.73%
Browse	8.96%	85.70%	36.10%	75.85%	77.03%	82.46%			96.66%	87.96%	93.75%	91.39%	93.20%						
Forage	0.44%	9.85%	56.00%	16.06%	10.99%	7.94%		84.44%											
Berries									0.45%	0.96%	0.50%	0.43%	0.56%						
Lichen	71.61%																		
Hare																			
Moose																			
Caribou																			
Ducks																			
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Merganser						Scaup						Hoary Marmot				
Pathway	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-S	Faro-N	Faro-S	Faro-W
Water	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.02%	0.01%	0.05%	0.02%	0.04%
Sediment	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	6.47%	6.47%	6.47%	6.47%	6.47%	6.47%					
Soil													8.65%	2.87%	9.52%	18.60%	20.21%
Fish	97.08%	97.08%	97.08%	97.08%	97.08%	97.08%											
Benthic							89.16%	89.16%	89.16%	89.16%	89.16%	89.16%					
Aquatic Veg							4.36%	4.36%	4.36%	4.36%	4.36%	4.36%					
Browse																	
Forage													91.33%	97.12%	90.43%	81.38%	79.76%
Berries																	
Lichen																	
Hare																	
Moose																	
Caribou																	
Ducks																	
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%

Pct by Pathway

Zinc	Bear			Wolf	Mink						Beaver						Fox		
Pathway	Bkgd	Van-M	Faro-M	Overall	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Rose U/S	Rose D/S	Van U/S	Van D/S	Pelly U/S	Pelly @ Crossing	Bkgd	Van-M	Faro-M
Water	0.02%	0.03%	0.04%	0.01%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%	0.10%	0.04%	0.05%	0.06%	0.03%	0.02%	0.11%	0.13%	0.10%
Sediment					6.66%	6.62%	6.65%	6.65%	6.61%	6.57%	4.41%	2.01%	2.49%	2.67%	1.23%	0.94%	14.09%	9.11%	22.51%
Soil	8.86%	6.64%	27.06%	3.03%															
Fish	4.98%	6.66%	8.89%		58.94%	58.55%	58.79%	58.79%	58.45%	58.15%									
Benthic					20.40%	20.27%	20.35%	20.35%	20.23%	20.13%									
Aquatic Veg					5.48%	5.45%	5.47%	5.47%	5.44%	5.41%	36.28%	16.55%	20.50%	22.00%	10.10%	7.73%			
Browse											59.21%	81.39%	76.95%	75.27%	88.65%	91.31%			
Forage	21.56%	62.00%	28.33%														3.69%	2.08%	2.19%
Berries	3.69%	2.41%	4.18%																
Lichen																			
Hare				0.48%	0.19%	0.85%	0.44%	0.45%	1.02%	1.53%							9.29%	4.65%	7.22%
Moose	55.12%	20.16%	28.52%	87.35%															
Caribou	5.76%	2.11%	2.98%	9.14%															
Ducks					8.29%	8.23%	8.27%	8.26%	8.22%	8.18%							72.83%	84.03%	67.99%
Total	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%