Wildlife contaminant monitoring near the Eagle Gold Mine 2024-2025

Introduction

The heap leach facility failure at the Eagle Gold Mine on June 24, 2024, released contaminants of concern into the environment. In the fall and winter of 2024, the Department of Environment worked with local harvesters to begin monitoring a suite of element and metal levels in wildlife near the mine. Although cyanide was released into the environment during the heap leach failure, it does not accumulate in tissues and was not tested in this study. While sample collection was initiated in the months immediately following the incident, contaminants do not accumulate in animal tissues within that time frame. The purpose of testing tissue samples from the 2024-2025 season was to help establish what concentration of elements and metals exist in these animal tissues currently.

Background

Some elements and metals occur naturally in the environment and are needed by living organisms. Some are present due to historical or ongoing human activities. Wild animals such as moose, caribou and furbearers can be exposed to these substances through eating contaminated vegetation, drinking contaminated water or through eating or scavenging on animal tissues that contain these elements or metals. If persistent in the environment, the amount of these elements in the animal's system can build up in organs and tissues (bioaccumulation).

In the fall and winter of 2024-2025, the Government of Yukon requested voluntary samples of ungulates and furbearer species from harvesters and trappers, who made this monitoring possible by submitting samples from their regular harvests. Their contributions were essential for building baseline data that will help us better

understand environmental changes, supporting community health and contributing to the long-term well-being of the Yukon's wildlife populations.

The objective of this work was to observe baseline trace element and heavy metal levels in ungulates and furbearers harvested in the areas geographically near the Eagle Gold Mine.

A **trace element** is a natural element required in very small amount by living things to stay healthy. Some trace elements are metals (like zinc, copper, iron) and some are non-metals (like manganese, selenium, molybdenum, chromium).

A **heavy metal** is broadly defined as a metal with a high atomic weight and density. Some heavy metals such as mercury, cadmium, arsenic, can be harmful to people and animals in even small amounts.

A **contaminant** is any element that is present in the environment at levels higher than what is normally expected or that poses a risk to health. This could be a trace element or a heavy metal.

In the context of this report, the term **elements** are used to refer to the trace elements and heavy metals that were analysed. See Appendix 1 for the list of elements tested.

Where, relative to the mine site, was the study conducted?

The tissues included in this study were from animals harvested or found in the areas shown in the maps in Appendix 2.

How many samples were collected?

The number of individual animals and the tissues collected for testing is found in the below table. The tissue samples from these animals provide an initial snapshot to understand baseline levels of trace elements and heavy metals. However, larger

numbers of samples from multiple years will be needed before contamination effects, if present, could be detected.

Table 1. List of animals and samples in the 2024 – 2025 mammal monitoring study

Animal type	Species	Number of individual animals in study	Tissues collected for analysis
Ungulate	Caribou	2	liver, muscle
Ungulate	Moose	4	kidney, liver, muscle
Furbearer	Beaver	1	kidney, liver
Furbearer	Ermine	3	kidney, liver
Furbearer	Marten	24	kidney, liver
Furbearer	Red fox	1	kidney, liver
Furbearer	Wolf	2	kidney, liver
Furbearer	Wolverine	1	kidney, liver

How are wildlife tissues tested for contaminants?

Element testing in animals is done on internal organ and/or muscle tissue samples. Harvested wildlife are a good source of samples as pieces of the tissues can be collected while carcasses are fresh. For this study, animals were not targeted for sampling – tissues came only from regular, legal harvesting practices by subsistence and licensed harvesters and were submitted voluntarily for testing. Tissues from one moose found dead in Game Management Subzone 258 was also included in the study. That moose was found dead in the South McQuesten River, retrieved by a conservation officer and had an undetermined cause of death.

For each animal, information such as the date, location of harvest and the animal's sex was recorded. Age determination is underway. Age can be an important piece of information, as bioaccumulation of elements and metals happens over time.

The submitted tissue samples were subsampled by an experience contractor following established protocols. The mercury analysis was completed at the Yukon Research Institute and all other analyses were performed by ALS laboratories in Ontario.

Ungulate results summary

Tissue from two caribou (hudzi) and four moose (denyák) were tested for 35 trace elements and heavy metals listed below. Similar studies have been conducted in the Yukon in the past (from samples collected between 1993-2005), but conclusive comparisons cannot be made because the study area, herd, tissues and subspecies studied were different. However, mercury concentrations in moose and caribou tissues were similar or lower compared to the historical data and average cobalt concentrations were also lower than historical data, in all but the caribou liver tissues. With the small number of samples for both the moose and caribou, statistical comparisons cannot be made.

Muscle tissue from the one moose that was found dead in the South McQuesten River had particularly high concentration of aluminum. The kidney and liver aluminum concentrations were not high, which indicates that the aluminum exposure may have occurred after the animal had died.

The element concentrations found in the moose and caribou tissues did not indicate toxicity in these individuals.

Furbearer results summary

Samples of kidney and liver from six furbearing species (one beaver, three ermine, twenty-four marten, one red fox, two wolves, one wolverine) were tested for 35 trace elements and heavy metals listed below. Similar furbearer studies have been conducted in the Yukon in the past (from samples collected between1993 and 1995), but laboratory techniques and detection limits have changed. A recently published study of element concentrations in Yukon wolverine was used for comparison for that species. Element concentrations were also compared to domestic animal data where reasonable comparison existed.

20 elements analyzed were present at similar or lower concentrations than the best available historical comparison. Fifteen elements were present in higher concentration than the historical comparison (arsenic, calcium, iron, lead, magnesium, manganese, molybdenum, phosphorus, potassium, rubidium, selenium, silver, sodium, strontium, zinc), and the potential for toxicity is unknown. Due to the small number of samples per species, and lack of any previous data from the same ecoregion and same species, statistical analysis can not be completed.

What have we learned, and what are the next steps?

This study has enabled an understanding of trace elements and heavy metals in mammal tissues harvested from the area around the Eagle Gold Mine. Further monitoring will continue in the 2025-2026 harvest season for both ungulates and furbearers.

If you are interested in collecting samples from animals you harvest, please visit a Department of Environment office in Whitehorse, Mayo or Dawson or at the First Nation of Na-Cho Nyäk Dun Lands Branch to pick up a sample collection kit and detailed instructions. Contact the Animal Health Unit for additional information about this study, by phone at 867-667-5600 or by email at animalhealth@yukon.ca.

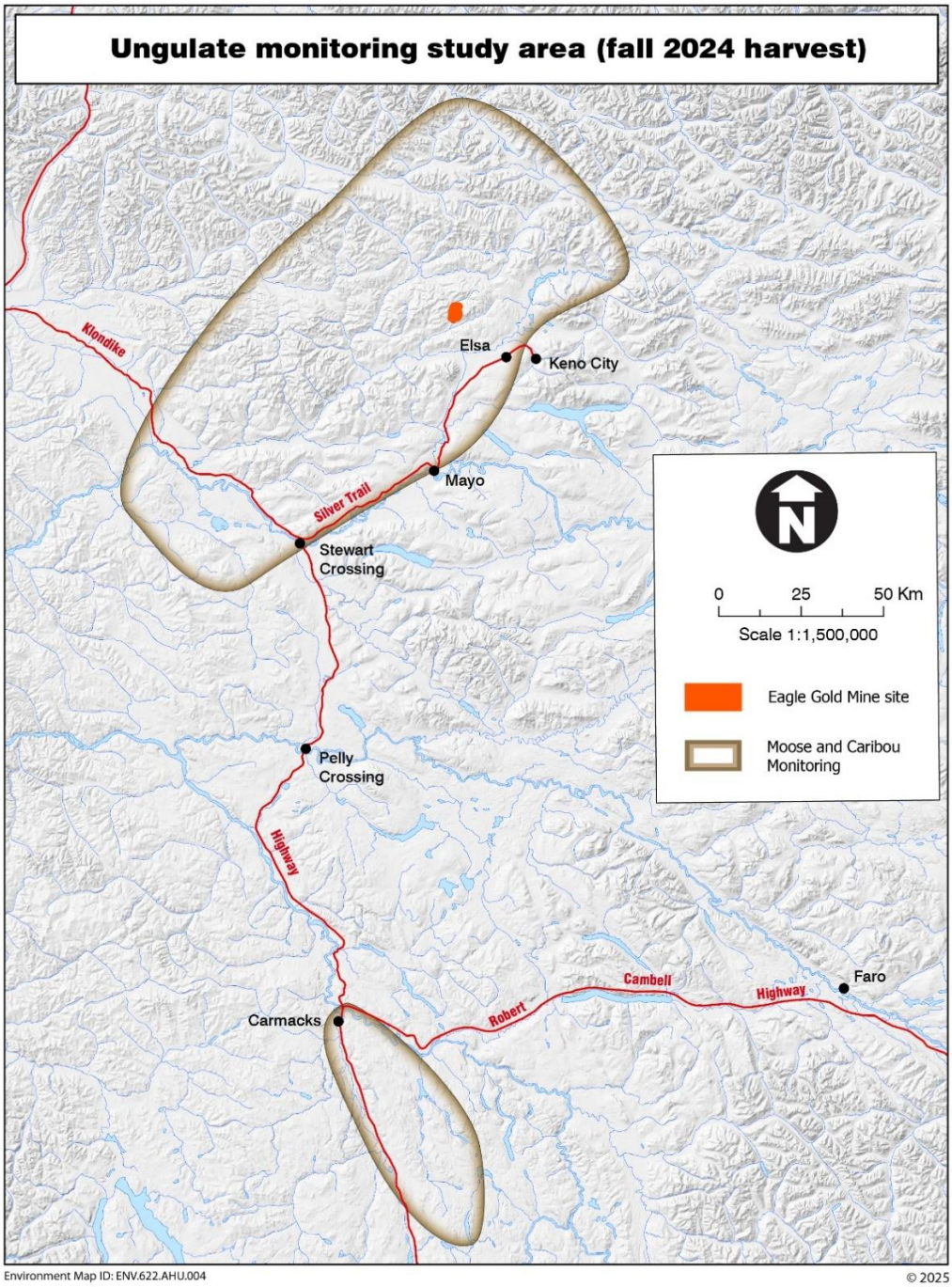
Appendix 1

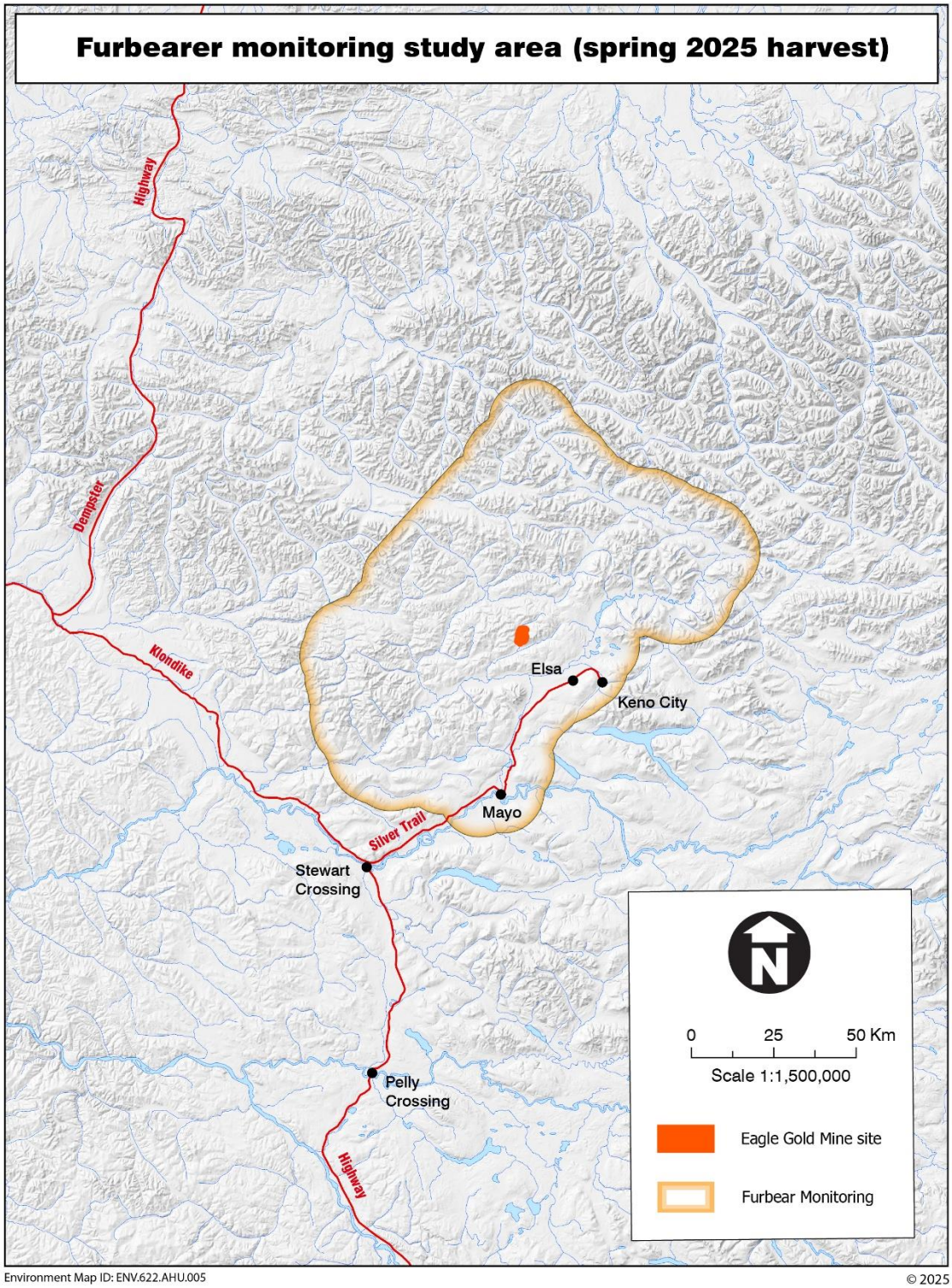
List of 35 elements tested

Aluminum	Cadmium	Lithium	Potassium	Thallium
Antimony	Calcium	Magnesium	Rubidium	Tin
Arsenic	Chromium	Manganese	Selenium	Tungsten
Barium	Cobalt	Mercury	Silver	Uranium
Beryllium	Copper	Molybdenum	Sodium	Vanadium
Bismuth	Iron	Nickel	Strontium	Zinc
Boron	Lead	Phosphorus	Tellurium	Zirconium

Appendix 2

Maps





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