Regional mineral resource assessment of Cassiar Terrane and eastern Yukon-Tanana Terrane

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ABSTRACT

In February 2000, Yukon Government Mineral Resources Branch convened a panel of industry geologists to estimate the likelihood of new discoveries in Cassiar Terrane and eastern Yukon-Tanana Terrane. The estimates were processed in a mineral deposit simulator. The simulated tonnage of metal for each tract (approximately 1000 km^2 of coherent geology) was converted to a dollar value, which in turn was used to rank the tracts relative to each other, from lowest to highest mineral potential. Separate runs of the simulator for significant deposit models were completed to produce model specific maps.

RÉSUMÉ

En février 2000, la Direction des ressources minérales du gouvernement du Yukon a convié un groupe de géologues du secteur privé pour estimer la probabilité de nouvelles découvertes dans le terrane de Cassiar et la partie est du terrane de Yukon-Tanana. Les estimations ont été traitées dans un simulateur de gisements minéraux. Le tonnage simulé de métaux pour chaque périmètre évalué (contenant une géologie cohérente sur environ 1000 km^2) a été converti en dollars, valeur ensuite utilisée pour établir le rang des périmètres les uns par rapport aux autres, en commençant par celui présentant le potentiel minéral le plus faible et en terminant par celui dont le potentiel est le plus élevé. Des essais séparés du simulateur pour des modèles de gisements significatifs ont été réalisés afin de produire des cartes propres au modèle.

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INTRODUCTION

Cassiar Terrane and the eastern part of Yukon-Tanana Terrane were the subject of a regional mineral resource assessment. The goal of the assessment was to outline the regional mineral potential of a large portion of the Teslin Tlingit First Nations Traditional Territory, and of the area of interest proposed for the Wolf Lake National Park Feasibility Study. The Cassiar/Yukon-Tanana regional mineral resource assessment area covers over 86% of the Teslin-Tlingit Council Traditional Territory (Fig. 1), as well as parts of the traditional territories of Selkirk First Nation, Little Salmon/Carmacks First Nation, Ross River Dena Council, and Liard First Nation.

REGIONAL MINERAL RESOURCE ASSESSMENT – METHODOLOGY

The methodology used by the Yukon Government for the production of regional mineral potential maps was developed by the United States Geological Survey (USGS; Drew, 1986), and refined by the British Columbia Geological Survey (BCGS; Kilby, 1995) to best fit the Canadian Cordillera. The mineral resource assessment of Cassiar and Yukon-Tanana terranes consisted of seven phases: 1) compilation, 2) definition of tracts, 3) preparation of deposit models, 4) assessment workshop, 5) data entry, 6) Monte Carlo simulation, and 7) ranking.

Regional mineral resource assessments make use of a publicly available geoscientific database, such as geological maps at 1:250 000 and 1:50 000 scale, including the recent bedrock geological compilation by Gordey and Makepeace (1999), regional airborne geophysical surveys, regional stream and lake sediment surveys (Hornebrook and Friske, 1988), and exploration history databases (Yukon MINFILE, 1997). No fieldwork or new data collection was completed.

The assessment workshop took place in February 2000. Five members from industry examined all the geological data one tract at a time, agreed upon which metallic mineral deposit models were pertinent to the tract, and made estimations of the likelihood of finding new deposits of each type in the tract. Each member recorded their confidence in the current knowledge of the geology of the tract, and distributed 100 points between the other four estimators to record their confidence in their knowledge and experience. The estimation data was digitized and processed by a Monte Carlo statistical simulator, which compares the estimations with grades and tonnages of existing deposits worldwide. Another software application converts simulated tonnages to dollar values, which are used to rank the tracts from highest to

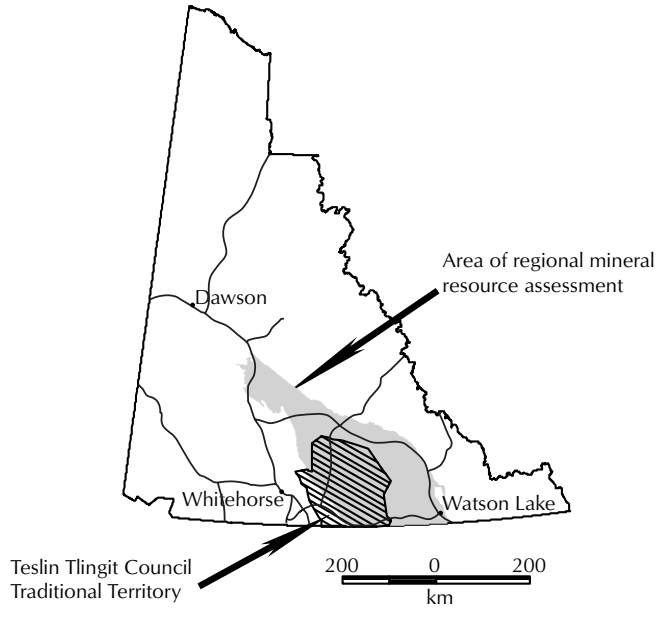

Figure 1. *Location map displaying the area of this regional mineral resource assessment, and the Teslin Tlingit First Nation Traditional Territory.*

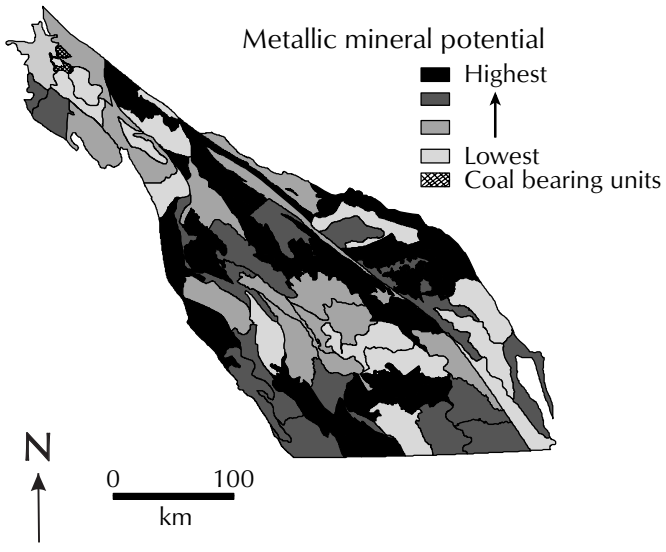

Figure 2. *Mineral potential map of Cassiar Terrane and eastern Yukon-Tanana Terrane.*

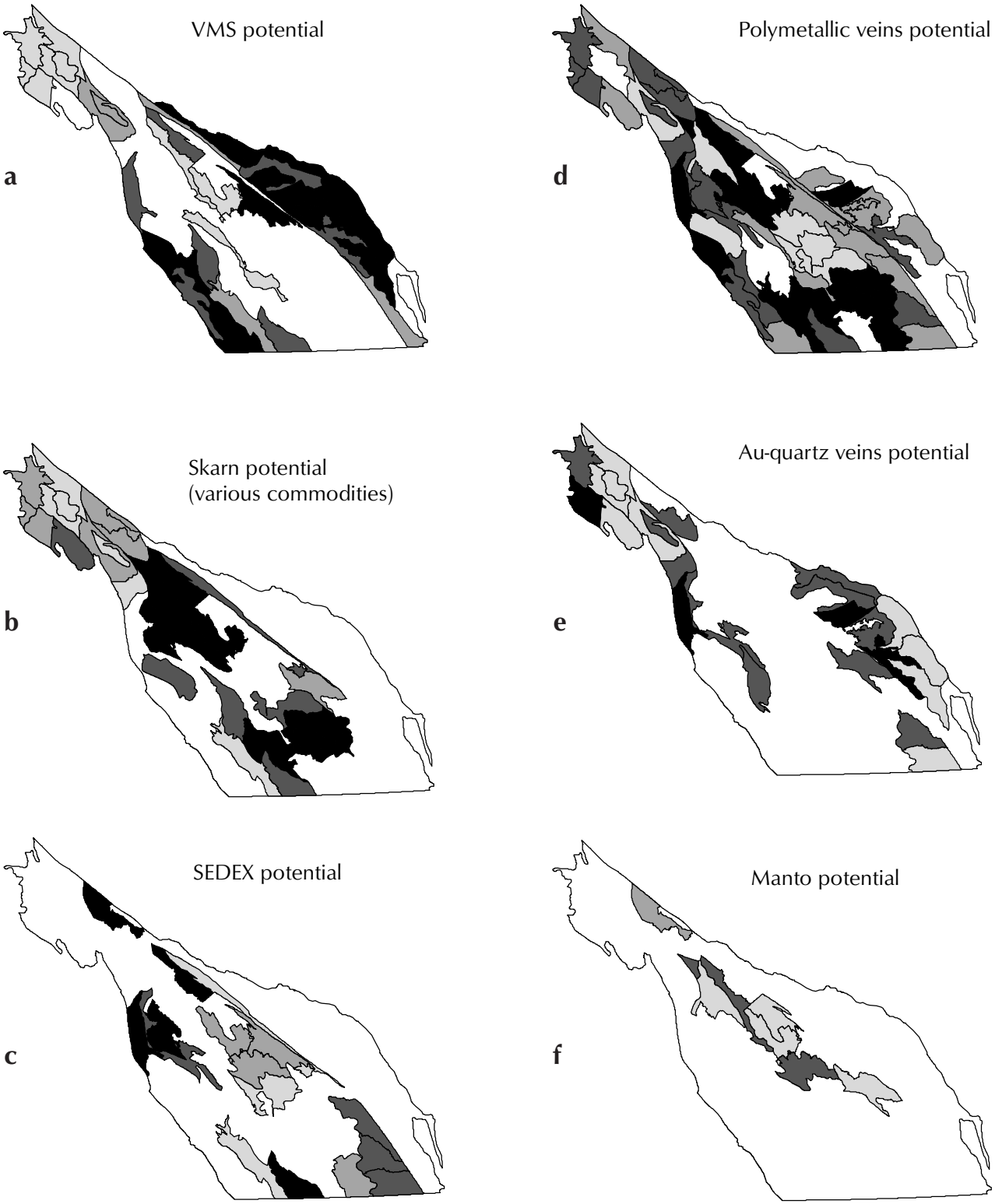

Figure 3. *Map of potential for (a) volcanogenic massive sulphide (VMS) deposits; (b) skarn deposits; (c) sedimentary exhalative (SEDEX) deposits; (d) polymetallic vein deposits; (e) gold-quartz vein deposits; and (f) polymetallic manto deposits.*

lowest potential. Separate runs of the simulator were also completed for individual deposit models.

The regional mineral potential map (Fig. 2) shows a relative rank, from highest to lowest potential for a variety of mineralization styles and commodities. Figure 3 displays maps of potential for specific mineral deposit models.

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