Canada

YUKON GEOLOGY PROGRAM

Yukon Economic Development

MINERAL POTENTIAL MAP OF THE CITY OF WHITEHORSE

OPEN FILE 1998-6

BY
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Contour Interval
25 metres

0 300 1500 3000
metres

Scale
1 : 30,000
UTM Zone 8 Projection

Gartner Lee Limited

INTRODUCTION

This mineral assessment was undertaken for the City of Whitehorse. A moratorium on staking within the city limits was in effect from June 1996 to June 1998. This assessment was conducted in order to provide the City with a tool to incorporate mineral resource values in their land use planning.

A compilation phase of geoscientific data was followed by an assessment phase where a panel of experts ranked the geological tracts in order of their relative potential to host metallic mineral deposits. This mineral potential map displays the conclusions of the assessment.

A review of the available geoscientific information included: existing geological maps, government reports and assessment reports. Private archival documents (maps, exploration summaries, etc) were graciously provided by Hudson Bay Exploration and Development (HBED), the owners of the old Whitehorse Copper Mines (WCM) ground and the largest land holders in the Copper Belt at the time of the assessment.

Most of the Whitehorse Copper Belt is included within the city limits. This 32 km long belt is defined by a linear series of copper skarn occurrences. This type of mineralization forms preferentially where the Cretaceous Whitehorse batholith intrudes the partially dolomitized limestones and clastic sediments of the Triassic Lewes River Group. Economic deposits form where irregularities in the contact produce pendants or embayments of sediments within the intrusive. Of all the deposits and showings in the Whitehorse Copper Belt, 28 have been mined intermittently from the turn of the century till the early 1960's. It is estimated that current reserves in the Copper Belt stand at 3 million tons of ore grading 1% copper.

METHODOLOGY

Geological and geophysical data as well as information on mineral occurrences were compiled in preparation for the assessment. The geochemical data was not compiled since the locally thick overburden masks the geochemical signature of the deposits.

A digital geology map at a scale to 1:20 000 was compiled by Craig Hart. The detailed WCM geology maps of various scales were incorporated to the pre-existing 1:50 000 regional mapping and the resulting linework was registered to a topographic base provided by the city.

The state of the geophysical database as well as the scope and the time constraints of this project limited the use of the available geophysical information. Nevertheless, tabulation and ranking of areas of geophysical interest was achieved by interpreting the clustering of airborne EM and ground IP anomalies, and noting if they had any magnetic coincidence or a favorable geological setting. Compilation of this information was contracted out to Amerok Geosciences Ltd.

Mineral occurrence information was compiled from: Minfile, existing geological maps, published reports by Dave Tenney and Pat Watson (DIAND), assessment reports, theses, private studies, internal property descriptions, and exploration summaries and proposals. A summary of the most recent exploration targets and results was tabulated for each area/deposit. It was concluded that outside of the deposits that were actively mined, the level of exploration was quite preliminary.

ASSESSMENT PANEL

On October 16, 1997 an expert panel was convened to assess the relative mineral potential of tracts within the City of Whitehorse. Members of the panel were: Dave Tenney, former chief geologist for Whitehorse Copper Mines; Gerry Bidwell and Robert Strohhein; both employees of HBED at the time of that company's exploration activity in the Copper Belt; Craig Hart, project geologist with the Yukon Geology Program. All of these participants had extensive expertise with the geology and mineral deposits of the Whitehorse area. Other panelists included Jeff Mitchell, geophysicist contracted through Amerok Geosciences to evaluate the geophysical database and Danièle Héon, mineral assessment geologist with YTG and coordinator of this project. Andy Hunsau, former exploration geologist for WCM, was reached by phone at the end of the session and was asked to comment and to supply additional information.

The task of the panel was to divide the study area into tracts of similar geology and then rank those tracts on the basis of their relative potential to host metallic mineral deposits. The potential for limestone was not evaluated due to the lack of information and general expertise within the group. None of the other industrial minerals were thought to occur in significant quantities within the city limits.

Information relevant to each mineral depositarea was reviewed. The study area was then divided into tracts, which were numbered from 1 to 36. Tract definition was influenced by the types of mineral deposits occurring or expected to occur in each area. Since skarn deposits are the most significant targets within Whitehorse, tracts were drawn overlapping the prospective contact and allowing for the uncertainty of the location of that contact. Through the ranking process, the tracts were grouped in 8 categories of mineral potential. The criteria defining each each category and the resulting ranking of tracts are outlined in the legend.

CONCLUSIONS

Categories 1 to 3 represent grund of very high mineral potential. Any withdrawal of these tracts from exploration activities is predicted to meet with resistance and criticism from the mineral industry. Tracts belonging in categories 4 through 6 have undergone various levels of exploration; our panel recommends further studies if any of these areas are to be considered for withdrawal. Categories 7 and 8 represent areas of minimal interest to the industry. Withdrawal of these lands is predicted to be the least contentious.

It must be emphasized that these conclusions are the best estimation of the relative mineral potential of the individual tracts, given the state of knowledge at the time of the assessment and the scope of this project. Conclusions should be revised with time as new discoveries are made within the City and elsewhere.

RECOMMENDED CITATION

HEON, D. and HART, C.J.R.: 1998. Mineral potential map of the City of Whitehorse. Exploration and Geological Services Division, Yukon, Indian and Northern Affairs Canada, Open File 1998-6 (1:30 000-scale)

Digital cartography by Will van Randen, Yukon Geology Program, and Forest Pearson, Gartner Lee Ltd.

Copies of this map may be purchased from Geoscience Information and Sales, c/o Whitehorse Mining Recorder, Indian and Northern Affairs Canada, Room 102-300 Main St. Whitehorse, Yukon, Y1A 2B5, Ph (867) 667-3266 or Fax (867) 667-3267.
This map was released in November 1998.

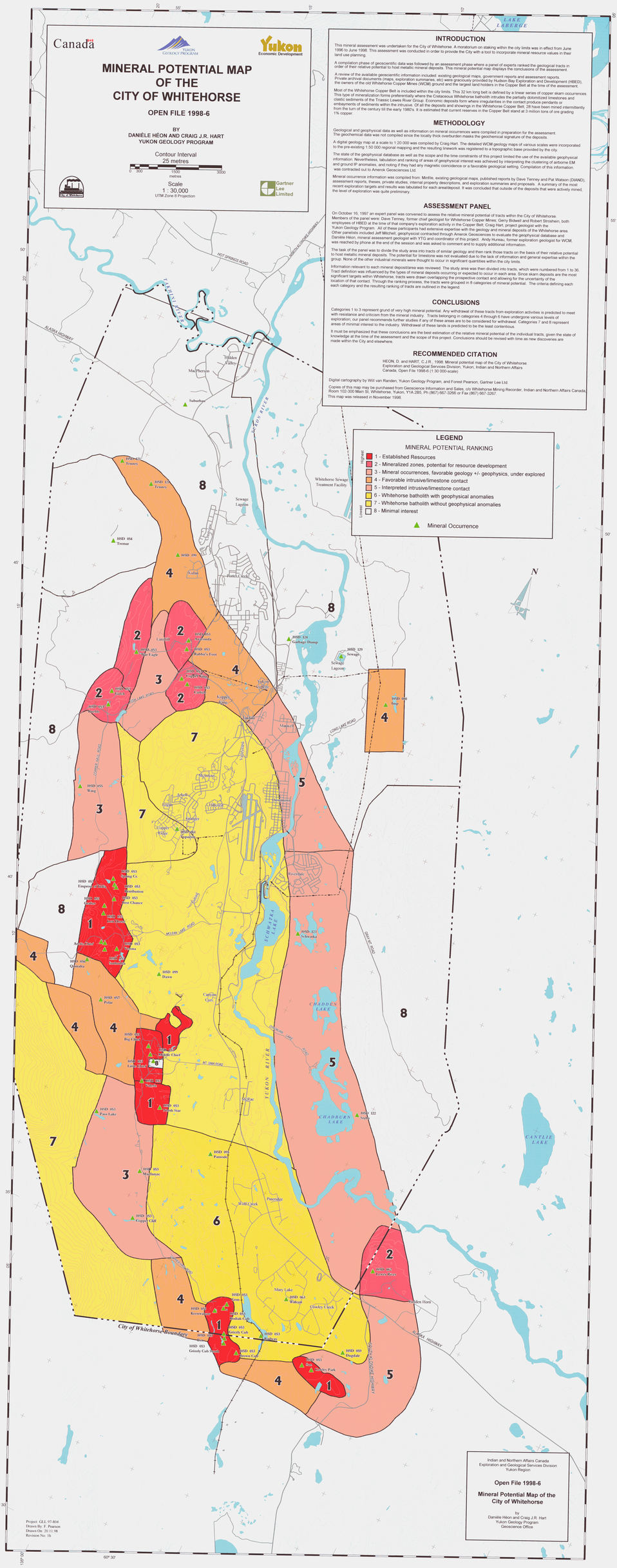
LEGEND

MINERAL POTENTIAL RANKING

Highest
- 1 - Established Resources
- 2 - Mineralized zones, potential for resource development
- 3 - Mineral occurrences, favorable geology +/- geophysics, under explored
- 4 - Favorable intrusive/limestone contact
- 5 - Interpreted intrusive/limestone contact
- 6 - Whitehorse batholith with geophysical anomalies
- 7 - Whitehorse batholith without geophysical anomalies
- 8 - Minimal interest

Lowest

Mineral Occurrence



Indian and Northern Affairs Canada
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