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HIGHLIGHTS OF THE MID-COAST MINERAL POTENTIAL PROJECT (92F, G, H, J, K, L, M, N, 93D, 102P, 103A)

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KEYWORDS: Mineral potential, Mid-Coast, southwest British Columbia, mineral assessment tract

INTRODUCTION

The mineral potential program was designed and implemented by the British Columbia Ministry of Energy, Mines and Petroleum Resources in response to a need for accurate and credible information for land-use planning. As part of that program, the Mid-Coast project was established to evaluate the mineral potential of southwestern British Columbia. This paper gives a geological overview for the Mid-Coast region and describes the results of phase 1 mineral potential analysis.

LOCATION

The Mid-Coast project is one of seven areas being studied (Figure 1). Other project areas include Vancouver Island (Massey, 1995, this volume), Cariboo-Chilcotin, Kootenay, Thompson-Okanagan (Church, 1995, this volume), Skeena-Nass (MacIntyre *et al.*, 1995, this volume) and the currently running Northeast project. The remaining northwest corner of the province is slated for compilation and evaluation in 1995-1996.

The Mid-Coast project covers 76 660 square kilometres of southwestern British Columbia. Its limits contain abundant low-lying islands and marine channels of the western coastal lowlands. Eastward, the topography rises abruptly to encompass the rugged ice-capped terrain of the Coast Mountains. Population centres within the limits of the study area include the city of Vancouver in the south and the northern coastal town of Bella Coola. The project area covers all of NTS map sheets 92M, 93D, 102P and 103A and parts of 92G, F, H, J, K, L, M, N (Figure 2).

PROCESS AND PRODUCTS

The mineral potential evaluation process involves numerous steps. Specific aspects of the approach adopted by the Geological Survey Branch are detailed in the mineral potential overview paper by Kilby (1995, this volume). Briefly the process involves:

- Geological compilation at a scale of 1:250 000.
- Delineation of mineral assessment tracts.
- Compilation of mineral deposit data.
- Review of geology by experts.
- Phase 1 mineral potential analysis.
- Estimations of undiscovered mineral deposits by industry experts.
- Phase 2 mineral potential analysis.

Figure 1. The Mid-Coast mineral potential project (1) is one of seven areas selected for study. Other areas are Vancouver Island (2), Cariboo-Chilcotin (3), Thompson-Okanagan (4), Kootenay (5), Skeena-Nass (6) and the currently running Northeast project (7).

Resources dedicated to the Mid-Coast project included the assignment of two full-time geologists to geological compilation. Compilation of the map sheets was completed in approximately 8 months. Project milestones included two map review sessions and two expert workshops each held in Vancouver and Smithers. These workshops reported to industry and government experts on the geology of the Mid-Coast region and the mineral potential evaluation process. After peer review and editing of the maps, the data were digitized and entered into the Terrasoft GIS system. This work took approximately 4 person-months to complete. The digital format of the geological compilation is GIS compatible and was released as Open File 1994-17 (Bellefontaine

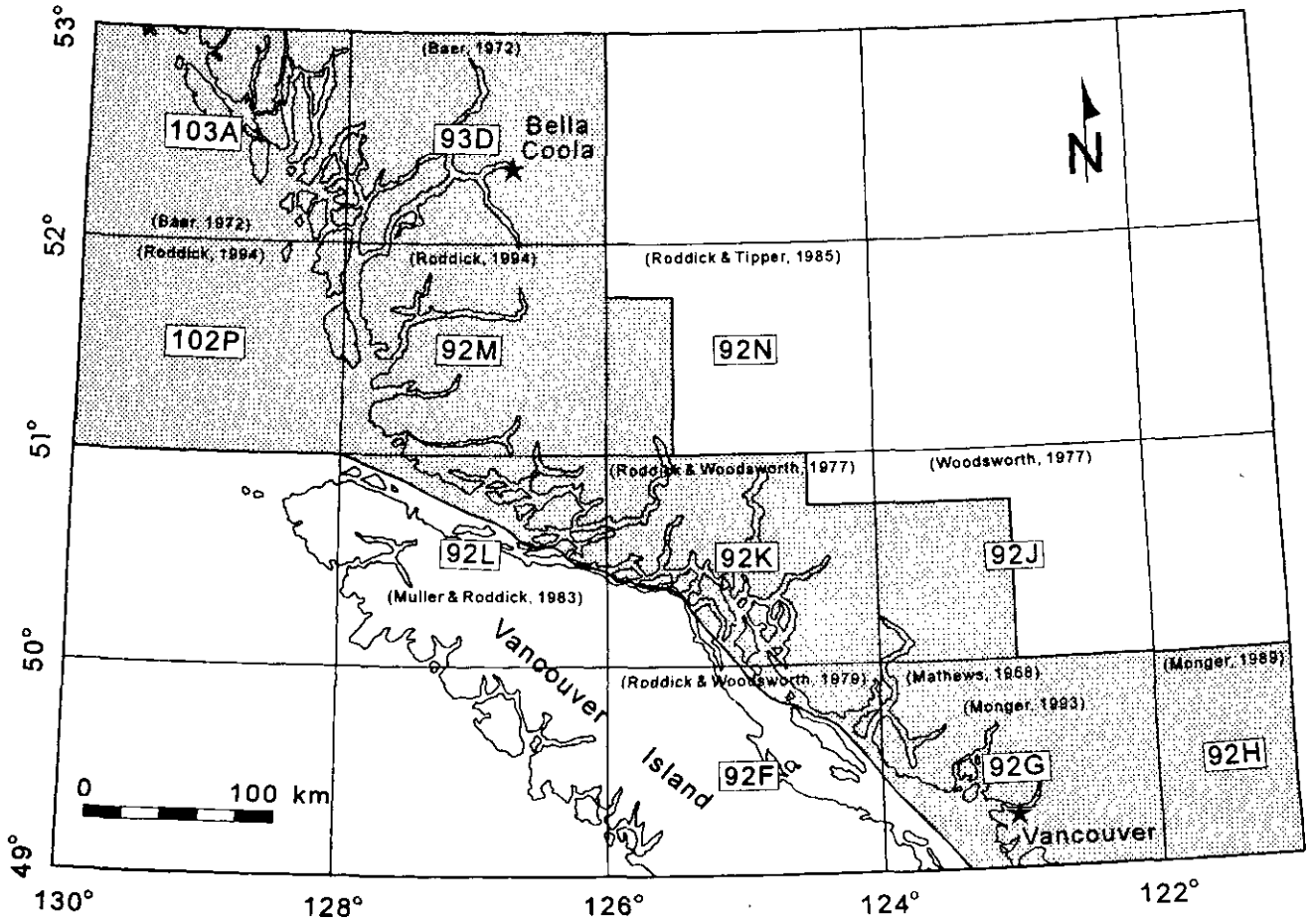

Figure 2. Location of the Mid-Coast mineral potential project detailing the NTS map sheets included in the study. References pertain to the main source of geological data for individual map sheets, mostly at 1:250 000 scale.

and Alldrick, 1994). Figure 3 shows the time line and current products of the Mid-Coast project.

SOURCES OF INFORMATION

All available published and unpublished data were incorporated in the geological compilation. Figure 2 shows the largest scale geological base maps available for the region; almost all are Geological Survey of Canada publications at a scale of 1:250 000. This information was complimented with data from approximately 40 papers, memoirs, bulletins and maps produced by the Geological Survey of Canada, a dozen Ministry of Energy, Mines and Petroleum Resources publications, 110 assessment reports, 20 journaled articles, and four theses. A complete listing of data sources used in compilation is provided in Bellefontaine and Alldrick (1994). The resulting compilation and interpretations have been refined by the expert reviews of Jim Roddick, Glenn Woodsworth, Jim Monger, Peter van der Heyden and Murray Journeay of the Geological Survey of Canada.

Compared to other regions of study, the Mid-Coast yielded a smaller amount of information, especially in the north. This is due lack of access, steep topography, large glacial masses and dense coastal forest which all contribute to the paucity of data. This is well represented in Figures 4a and b which display the location of mineral occurrences recorded in MINFILE and assessment reports in the project area. Exploration activity has clearly been focused in the southern parts of the region where access and infrastructure are better. Consequently the geological database is larger and more complete (*i.e.*, RGS and aeromagnetic coverage).

GEOLOGICAL COMPILATION

Due to the complexity of the geology and the large size of the Mid-Coast project area, the geological setting will be discussed only in very broad terms. A geological map of the project area is not included with this paper due to the difficulty of reproducing the data at page scale. Readers are referred to Bellefontaine and Alldrick (1994) for the most up-to-date geological compilation and detailed lithologic descriptions. The terrane map (Wheeler *et al.*, 1991) and tectonic assemblage map (Wheeler and McFeely, 1991) are ideal for obtaining an overview of the tectonic framework of the area.

The rocks of the Mid-Coast region record the Late Jurassic to Cretaceous subduction and accretion of two composite terranes; the Insular and Intermontane superterranes. The resulting plutonic and metamorphic welt occupies the core of the study area and is comprised of the Coast Plutonic Complex and the Central Gneiss Complex respectively. Strata belonging to pre-collisional terranes are often preserved as interpluton septa and roof pendants. Many of the pendants cannot be definitely correlated with their parent terranes due to the complexity of deformation and degree of metamorphism.

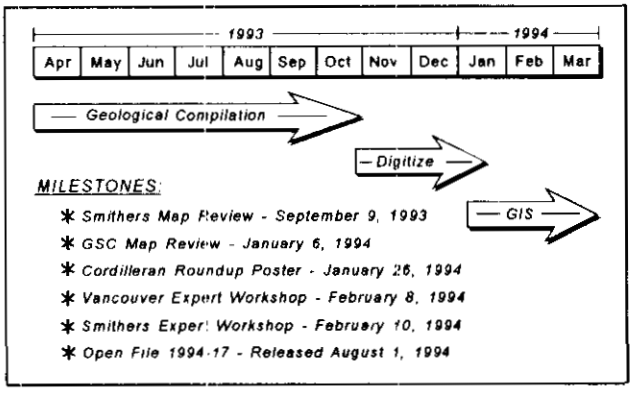

Figure 3. Time-line of the Mid-Coast mineral potential project detailing milestones and current products.

Fragments of eleven terranes exist in the Mid-Coast area. Volcanic arc assemblages occur in both the Insular and Intermontane belts and comprise segments of Paleozoic Chilliwack, Paleozoic and Mesozoic Wrangell, Triassic Cadwallader and Quesnel, and Jurassic Stikine and Harrison Lake terranes. The Paleozoic Alexander Terrane, located in the Insular Belt, comprises a variety of geologic environments including arc, back-arc and rift settings. Metamorphosed continental shelf strata of probable Proterozoic and Paleozoic age are represented by the ill-defined Nisling Terrane and make up a large part of the Central Gneiss Complex. Paleozoic to Mesozoic oceanic crust, accretionary prism and associated sedimentary rocks are restricted to the Intermontane Belt and include the Shuksan and Bridge River terranes. The intrusive rocks of the Coast Plutonic Complex stitch these terranes together and include pre-, syn- and post-deformational plutons. Recent work in the southern Coast Belt has demonstrated that the intrusive rocks fall into broad belts of similar age (Monger, 1993; Monger and McNicoll, 1993; Friedman and Armstrong, 1990). The main pulses of plutonism occurred during the late Middle Jurassic, Late Jurassic, Jura-Cretaceous, and Middle Cretaceous. Subsequent Late Cretaceous and Tertiary intrusions form discreet bodies in the eastern areas of the Coast Belt.

During the accretionary process the Cretaceous Gambier volcanic arc formed on top of the Insular, Coast and Intermontane belts. The Georgia Basin, and its largest component, the sedimentary Nanaimo Group, also formed an overlap assemblage. It contains material eroded from both the Insular and Coast belts. Other major groups of Cenozoic rocks include the Tertiary Chilcotin plateau basalts, the Tertiary to Quaternary Anahim plume volcanics and the Quaternary to Recent Garibaldi arc system. In this study the geology of the Mid-Coast region has been subdivided into 144 distinct lithologic units (Bellefontaine and Alldrick, 1994); 82 are layered and 62 are intrusive.

Large-scale structural features, reflecting a variety of tectonic regimes, are abundant in the project area. Contractional faults and imbricate thrust systems are related to deformation in the Northwest Cascade system and the Coast Mountains. Northeast-verging thrust faults include the Sheemahant thrust, the Ashlu Creek fault zone and the Chuwanten fault. The Thomas Creek fault zone, the Menzies Point shear zone, the Fire Creek thrust and the Shuksan thrust are all southwest-directed structures. Large right-lateral transcurrent fault systems were superimposed during the Cretaceous and Tertiary and include the Harrison Lake shear zone and the many strands of the Fraser fault system. Northeast-striking structures such as the Vedder, Sumas and Coquihalla faults are located in the southernmost parts of the study area and were active during the Tertiary. Additional crustal-scale faults and lineaments include the Grenville Channel fault, the Principe-Laredo lineament and the Work Channel lineament. Other newly recognized, unnamed regional-scale structures have also been identified as a result of this compilation work.

There is a very strong northwest-trending structural grain that extends through the Mid-Coast area. Although the voluminous intrusions of the Coast Plutonic Complex tend to mask much of the pre-accretionary geology, this study has shown that many of the terranes maintain their integrity toward the northwest. This has strong implications for the mineral potential of the northern Mid-Coast area.

DELINEATION OF TRACTS

Mineral assessment tracts are areas of land containing similar internal bedrock geology. For comparative purposes it is essential that these units be of similar size. Large deviations in tract size may result in unrealistic high and low rankings of mineral potential. Tract boundaries are non-political and non-geographic and are usually defined by regional-scale faults and terrane boundaries.

Sixty-one mineral assessment tracts were delineated for the Mid-Coast region (Figure 5). The average tract size is 125 640 hectares. The smallest tract is Silverthrone Mountain (G-1) with an area of 28 846 hectares. The Bella Coola tract (GA-6) is the largest at 340 866 hectares. The main lithologic units in each tract are listed in Table 1.

RESOURCES

Known resources in the Mid-Coast region are listed in Table 2. Some of the most important commodities in

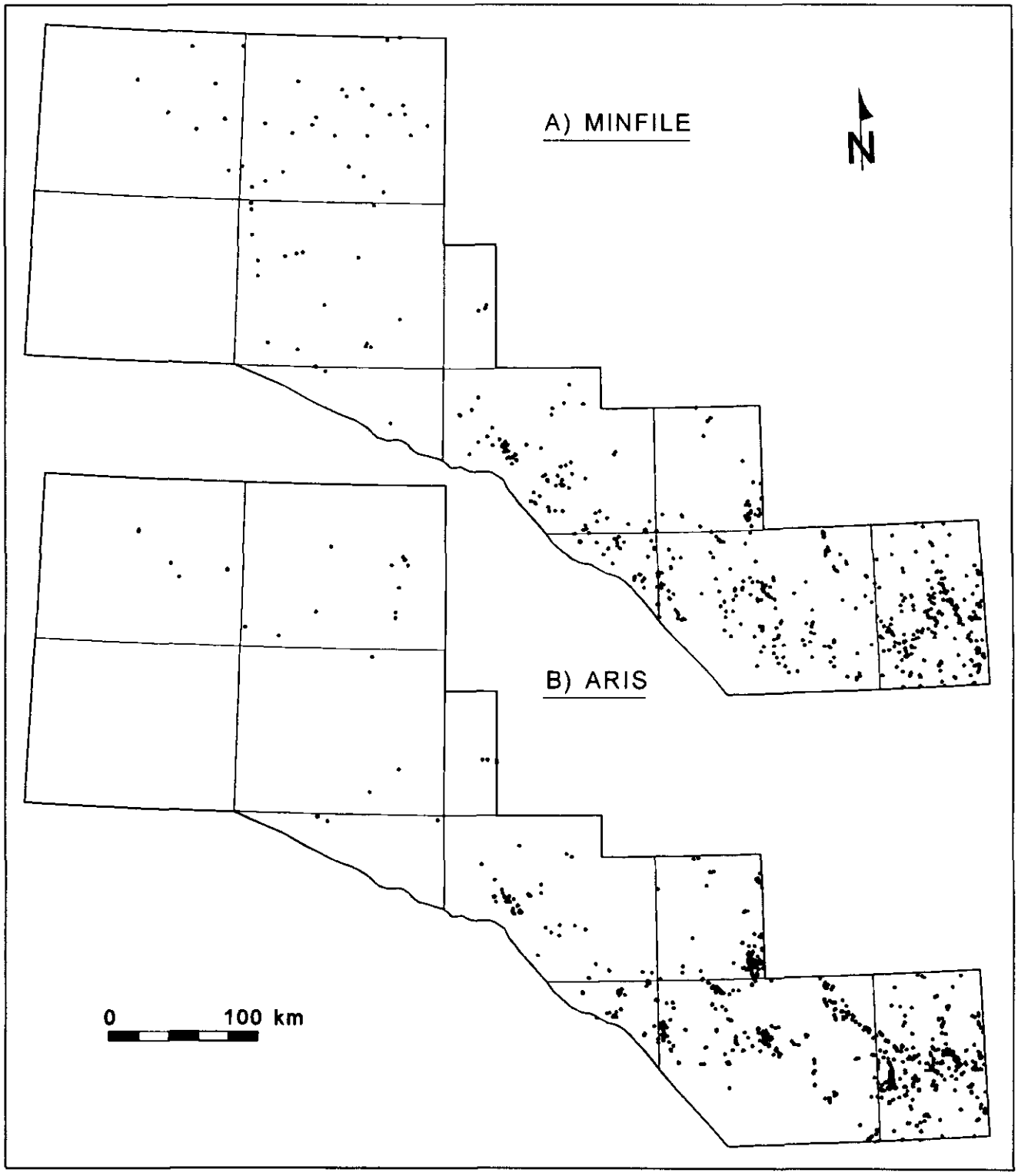

Figure 4. Exploration activity in the Mid-Coast region has clearly focused on areas close to the Lower Mainland. Map A shows the distribution of 600 mineral occurrences in the project area; 83% fall within 200 kilometres of Vancouver. Map B displays the distribution of 1112 assessment reports for the same region; 92% of the reports have been filed within a 200-kilometre radius of Vancouver.

the project area include copper, gold, lead, zinc, silver and molybdenum. The majority of the metallic mineral deposits occur in volcanic terranes often associated with large-scale structures. In general, the mineral potential of the layered rocks is higher than the bulk of the intrusives in the Coast Plutonic Complex.

The project area has been host to many notable past producers. Mining of copper, zinc, silver and gold at the

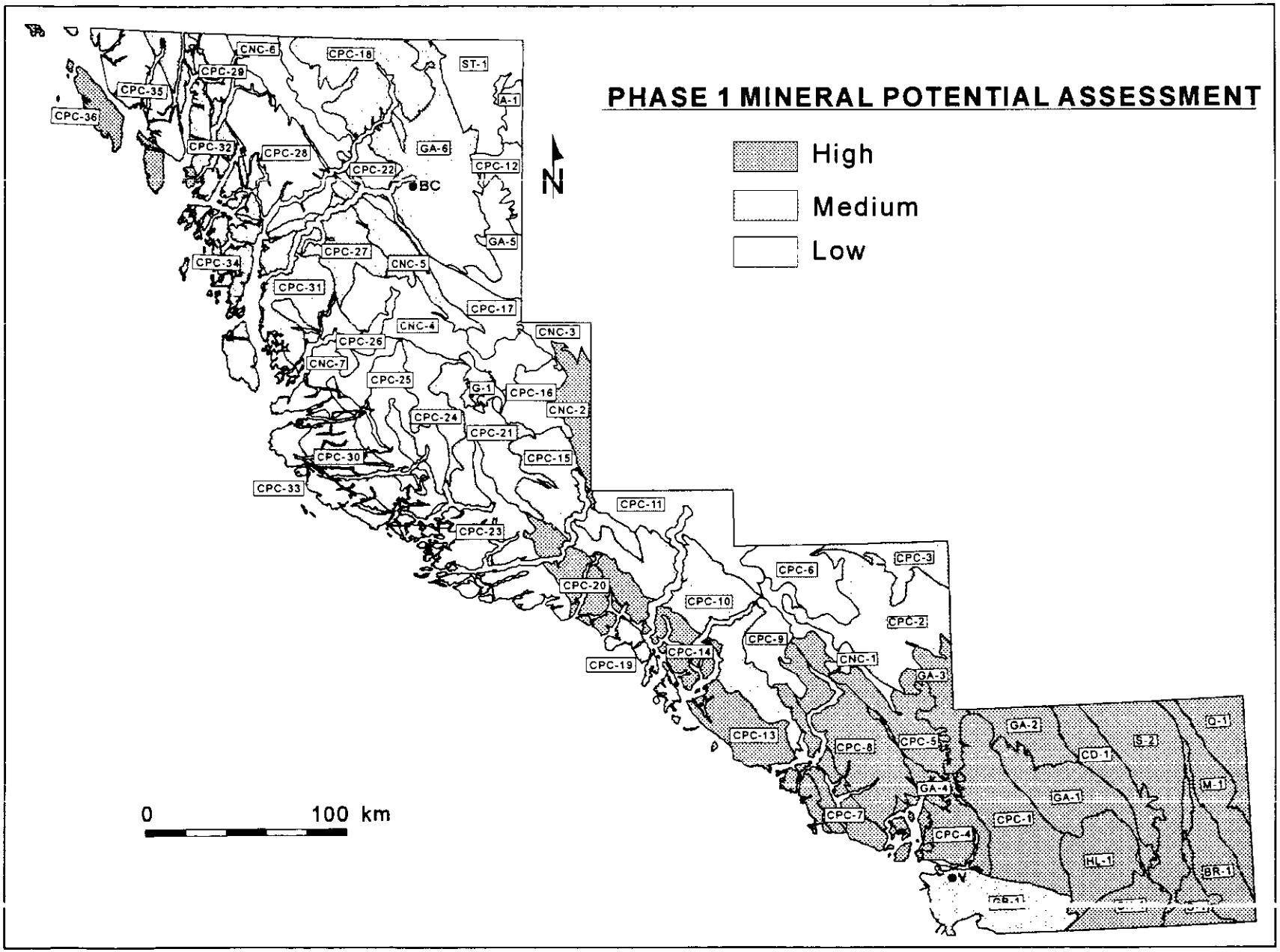

Figure 5. Map showing the 61 mineral assessment tracts of the Mid-Coast region and the results of the phase 1 analysis. The land base is divided equally by total area into high, medium and low mineral potential categories.

TABLE 1. TECTONIC AND LITHOLOGIC COMPONENTS OF MINERAL ASSESSMENT TRACTS

TRACT ID	TRACT NAME	MAIN LITHOLOGICAL UNITS	TECTONIC ELEMENT
GA-4	Britannia	Garibaldi volcanics, Gambier Gp, Coast Plutonic Suite	Tertiary overlap, Mesozoic overlap, Coast Plutonic Complex
M-1	Manning	Princeton Gp, Pasayten Gp, Jackass Mtn. Gp, Thunder Lake sequence, Ladner Gp, Dewdney Ck. Fm, Spider Peak Fm, Mount Lytton Cpx, Bridge River Cpx, Coast Plutonic Suite	Tertiary overlap, Methow, Quesnel, Bridge River, Coast Plutonic Complex
HL-1	Harrison Lake	Unknown metamorphics, Kent Fm, Billhook Creek Fm, Harrison Lake Fm, Camp Cove Fm, Coast Plutonic Suite	Unknown, Harrison Lake, Coast Plutonic Complex
GA-3	Northair	Garibaldi volcanics, Gambier Gp, Cadwallader Gp?, Coast Plutonic Suite	Tertiary overlap, Mesozoic overlap, Cadwallader?, Coast Plutonic Complex
S-2	Spuzzum	Shuksan schist, Hornet Creek gneiss, Chilliwack Gp, Bridge River Cpx, Yellow Aster Cpx, Mt. Barr batholith, Scuzzy pluton, Spuzzum pluton, Coast Plutonic Suite	Shuksan, Bridge River, Chilliwack, Coast Plutonic Complex
GA-1	Mount Clarke	Garibaldi volcanics, Gambier Gp, Coast Plutonic Suite	Tertiary overlap, Mesozoic overlap, Coast Plutonic Complex
CPC-20	Loughborough Inlet	Karmutsen Fm, Quatsino Fm, Coast Plutonic Suite	Wrangellia, Coast Plutonic Complex
CPC-13	Powell River	Nanaimo Gp, Karmutsen Fm, Quatsino Fm, Coast Plutonic Suite	Geogia Basin stratigraphy, Wrangellia, Coast Plutonic Complex
CPC-5	Cloudburst	Garibaldi volcanics, gneiss, Cloudburst pluton, Coast Plutonic Suite	Tertiary overlap, Central Gneiss Cpx, Coast Plutonic Complex
CPC-4	Cypress Bowl	Unknown metamorphics, Nanaimo Gp, Gambier Gp, Bowen Island Gp, Coast Plutonic Suite	Unknown, Georgia Basin stratigraphy, Mesozoic overlap, Wrangellia, Coast Plutonic Complex
S-1	Chilliwack	Skagit Fm, Princeton Gp, Custer gneiss, Shuksan schist, Chilliwack Gp, Bridge River Cpx, Coast Plutonic Suite,	Tertiary overlap, Shuksan, Chilliwack, Bridge River, Coast Plutonic Complex
Q-1	Spences Bridge	Coquihalla Fm, Princeton Gp, Spences Bridge Gp, Nicola Gp, Eagle Plutonic Cpx, Mt. Lytton Cpx, Coast Plutonic Suite	Tertiary overlap, Quesnel, Coast Plutonic Complex
GA-2	Fire Lake	Gambier Gp, Mt. Clarke pluton, Thomas Lake pluton, Pemberton diorite, Coast Plutonic Suite	Mesozoic overlap, Coast Plutonic Complex
CPC-7	Bowen Island	Bowen Island Gp, Karmutsen Fm, Quatsino Fm?, Coast Plutonic Suite	Wrangellia, Coast Plutonic Complex
CH-1	Bridal Falls	Princeton Gp, Slollicum schist, Gambier Gp?, Kent Fm, Cultus Fm, Chilliwack Gp, Vedder Cpx, Bridge River Cpx, Cogburn schist	Tertiary overlap, Cadwallader, Mesozoic overlap, Harrison Lake, Chilliwack, Bridge River
BR-1	Hozameen	Hozameen Cpx, Bridge River Cpx, Coast Plutonic Suite	Bridge River, Coast Plutonic Complex
CD-1	Breakenridge	Breakenridge gneiss, Shuksan schist, Slollicum schist, Bridge River Cpx, Cogburn schist, Chilliwack Gp, Mt. Mason pluton, Coast Plutonic Suite	Mesozoic overlap, Shuksan, Cadwallader, Bridge River, Chilliwack, Coast Plutonic Complex
CNC-2	Klinaklini River	Tertiary volcanics, metamorphics, gneiss, Coast Plutonic Suite	Tertiary overlap, Stikinia?, Central Gneiss Cpx, Coast Plutonic Complex
CPC-14	Bute Inlet	Cretaceous volcanics, Karmutsen Fm, West Redonda pluton, Coast Plutonic Suite	Mesozoic overlap, Wrangellia, Coast Plutonic Complex
CPC-1	Pitt Lake	Garibaldi volcanics, unknown metamorphics, Gambier Gp, Coast Plutonic Suite	Tertiary overlap, Unknown, Mesozoic overlap, Coast Plutonic Complex
CPC-36	Aristazabal Island	Lake Island Fm, metasediments and metavolcanics, Coast Plutonic Suite	Tertiary overlap, Alexander, Coast Plutonic Complex
CPC-8	Jervis Inlet	Gambier Gp, Coast Plutonic Suite	Mesozoic overlap, Coast Plutonic Complex
CPC-33	Cape Caution	Karmutsen Fm, Paleozoic volcanic and sedimentary rocks, Coast Plutonic Suite	Wrangellia, Coast Plutonic Complex
GA-6	Bella Coola	Gambier Gp, Coast Plutonic Suite	Mesozoic overlap, Coast Plutonic Complex
CPC-19	Surge Narrows	Karmutsen Fm, Bonanza Gp, Harbledown Fm, Coast Plutonic Suite	Wrangellia, Coast Plutonic Complex
CPC-3	Sampson-Delilah	Garibaldi volcanics, Gambier Gp, Cadwallader Gp, gneiss, metamorphics	Tertiary overlap, Mesozoic overlap, Cadwallader, Central Gneiss Cpx, Stikinia?
CPC-10	Toba Inlet	Gambier Gp, Karmutsen Fm, metamorphics, gneiss, Paradise River pluton, Goat Lake pluton, Coast Plutonic Suite	Mesozoic overlap, Wrangellia, Stikinia?, Central Gneiss Cpx, Coast Plutonic Complex
CPC-30	Seymour Inlet	Paleozoic volcanic and sedimentary rocks, Coast Plutonic Suite	Wrangellia, Coast Plutonic Complex
CPC-2	Meagher Creek	Garibaldi volcanics, Gambier Gp, gneiss, Coast Plutonic Suite	Tertiary overlap, Mesozoic overlap, Central Gneiss Cpx, Coast Plutonic Complex
CPC-27	Kwatna River	Tertiary volcanics, metasediments and metavolcanics, Coast Plutonic Suite	Tertiary overlap, Alexander, Coast Plutonic Complex
CPC-32	Roderick Island	Lake Island Fm, metasediments and metavolcanics, Coast Plutonic Suite	Tertiary overlap, Alexander, Coast Plutonic Complex
CPC-31	Namu	Metasediments and metavolcanics, Coast Plutonic Suite	Alexander, Coast Plutonic Complex
CPC-24	Wakeman River	Metamorphics, gneiss, Coast Plutonic Suite	Stikinia?, Central Gneiss, Cpx, Coast Plutonic Complex
CPC-15	Knight Inlet	Tertiary volcanics, metamorphics, gneiss, Coast Plutonic Suite	Tertiary overlap, Central Gneiss Cpx, Stikinia?, Coast Plutonic Complex

TECTONIC AND LITHOLOGIC COMPONENTS OF MINERAL ASSESSMENT TRACTS

TRACT ID	TRACT NAME	MAIN LITHOLOGICAL UNITS	TECTONIC ELEMENT
CPC-34	Bella Bella	Lake Island Fm, Bella Bella Fm, metasediments and metavolcanics, Coast Plutonic Suite	Tertiary overlap, Alexander, Coast Plutonic Complex
CNC-5	South Bentick Arm	Metamorphics, gneiss, Coast Plutonic Suite	Nisling?, Central Gneiss Cpx, Coast Plutonic Complex
CPC-18	Kimsquit	Gambier Gp, Gamsby Cpx, metamorphics, gneiss, Coast Plutonic Suite	Mesozoic overlap, Stikinia, Nisling?, Central Gneiss Cpx, Coast Plutonic Complex
CPC-21	Kingcome River	Garibaldi volcanics, gneiss, Coast Plutonic Suite	Tertiary overlap, Central Gneiss Cpx, Coast Plutonic Complex
GB-1	Vancouver	Point Grey eruptives, Kitsilano Fm, Nanaimo Gp, Coast Plutonic Suite	Georgia Basin stratigraphy, Coast Plutonic Complex
CNC-7	Rivers Inlet	Paleozoic volcanic and sedimentary rocks, metamorphics, gneiss, Coast Plutonic Suite	Wrangellia, Stikinia?, Central Gneiss Cpx, Coast Plutonic Complex
CPC-22	Tezwa River	Gambier Gp, metamorphics, gneiss, Coast Plutonic Suite	Mesozoic overlap, Nisling?, Central Gneiss Cpx, Coast Plutonic Complex
CNC-6	Nascall River	Metamorphics, gneiss, Coast Plutonic Suite	Nisling?, Central Gneiss Cpx, Coast Plutonic Complex
CPC-12	Atnarko	Chilcotin Gp, Gambier Gp, Coast Plutonic Suite	Tertiary overlap, Mesozoic overlap, Coast Plutonic Complex
ST-1	Tweedsmuir	Chilcotin Gp, Gambier Gp, Smithers Fm, Hazelton Fm, Coast Plutonic Suite	Tertiary overlap, Mesozoic overlap, Stikinia, Coast Plutonic Complex
CPC-11	Superb Mountain	Tertiary volcanics, metamorphics, gneiss, Coast Plutonic Suite	Tertiary overlap, Stikinia?, Central Gneiss Cpx, Coast Plutonic Complex
CPC-28	Ocean Falls	Metasediments and metavolcanics, metamorphics, gneiss, Coast Plutonic Suite	Alexander, Nisling?, Central Gneiss Cpx, Coast Plutonic Complex
CPC-23	Gilford Island	Paleozoic volcanic and sedimentary rocks, gneiss, Coast Plutonic Suite	Wrangellia, Central Gneiss Cpx, Coast Plutonic Complex
CPC-9	Big Julie	Big Julie pluton	Coast Plutonic Complex
CNC-3	Knot Creek	Metamorphics, gneiss, Coast Plutonic Suite	Stikinia?, Central Gneiss Cpx, Coast Plutonic Complex
CPC-26	Amback	Coast Plutonic Suite	Coast Plutonic Complex
G-1	Silverthrone Mtn.	Garibaldi volcanics, metamorphics, gneiss, Coast Plutonic Suite	Tertiary overlap, Stikinia, Central Gneiss Cpx, Coast Plutonic Complex
CPC-6	Clendenning	Coast Plutonic Suite	Coast Plutonic Complex
CPC-29	Sheep Passage	Metasediments and metavolcanics, Coast Plutonic Suite	Alexander, Coast Plutonic Complex
A-1	Anahim	Anahim volcanics, Chilcotin Gp, Coast Plutonic Suite	Tertiary overlap, Coast Plutonic Complex
CPC-16	Tumult Glacier	Garibaldi volcanics, gneiss, Coast Plutonic Suite	Tertiary overlap, Central Gneiss Cpx, Coast Plutonic Complex
CPC-25	Doos Creek	Gneiss, Coast Plutonic Suite	Central Gneiss Cpx, Coast Plutonic Complex
CNC-1	Princess Louisa	Gneiss, Coast Plutonic Suite	Central Gneiss Cpx, Coast Plutonic Complex
GA-5	Monarch	Gambier Gp, Coast Plutonic Suite	Mesozoic overlap, Coast Plutonic Complex
CPC-35	Princess Royal	Metasediments and metavolcanics, Coast Plutonic Suite	Alexander, Coast Plutonic Complex
CNC-4	Owikeno Lake	Garibaldi volcanics, metamorphics, gneiss, Coast Plutonic Suite	Tertiary overlap, Stikinia?, Central Gneiss Cpx, Coast Plutonic Complex
CPC-17	Sheemahant River	Sheemahant thrust zone, Coast Plutonic Suite	Coast Plutonic Complex

Tectonic elements listed are terranes unless otherwise stated. The tract identification label is based on the most abundant tectonic or lithologic component of the tract. Abbreviations: GA-Gambier, M-Methow, HL-Harrison Lake, S-Shuksan, CPC-Coast Plutonic Complex, Q-Quesnel, CH-Chilliwack, BR-Bridge River, CD-Cadwallader, CNC-Central Gneiss Complex, GB-Georgia Basin, ST-Stikine, G-Garibaldi, A-Anahim, Fm-Formation, Gp-Group, Cpx-Complex.

historic Britannia mine lasted more than 70 years. The Carolin and Aurum mines, located along the East Hozameen fault, produced gold and silver intermittently between 1928 and 1984. The Northair mine, located near the town of Whistler, mined gold, silver, lead and zinc from veins between the years of 1974 and 1982.

In addition to past production and known resources, the Mid-Coast region has potential for future discoveries of numerous types of mineral deposits. Volcanic rocks of the Wrangell, Alexander, Stikine, Harrison Lake and Quesnel terranes and the Gambier Group have potential for hosting porphyries, volcanogenic massive sulphide deposits, skarns, epithermal systems and other vein types. Quaternary volcanics of the Anahim and Garibaldi chains have geothermal potential. Oceanic rocks of the Bridge River and Shuksan terranes may host mesothermal gold veins, gabbroic nickel-copper, Cyprus-type massive sulphide deposits, podiform chromite, talc, asbestos and other industrial minerals. The Coast Plutonic Complex has the potential to host numerous types of industrial minerals, porphyry deposits and veins.

MINERAL POTENTIAL RESULTS

One of the primary goals of the mineral potential project is to predict the future mineral potential of the land base. This is accomplished by a two-phase analysis which ranks the tracts within a study area relative to each other. The phase 1 analysis ranks the land using factual, historical information. It deals only with six major metallic commodities: gold, silver, lead, zinc, copper and molybdenum. Phase 2 predicts the future mineral potential of an area by using probabilistic estimates of undiscovered resources made by experts. It involves additional metallic and nonmetallic commodities including industrial minerals.

TABLE 2. MINERAL RESOURCES IN MID-COAST AREA

TRACT ID	COMMODITIES	DEPOSIT TYPE	DEPOSIT NAME
GA-4	Cu, Zn, Pb, Ag, Au, Cd	Kuroko VMS	Britannia
	Cu, Mo	Porphyry	Gambier Island
	Cu, Zn, Pb, Ag	Polymetallic veins	McVicar
M-1	Au, Ag, Cu, Zn	Gold-quartz veins	Carolin
	Ag, Pb, Zn, Cu, Au, Sb	Polymetallic veins	Treasure Mtn.
	Cu, Au, Ag, Zn, Pb, Mo, U	Porphyry	Giant Copper
HL-1	Zn, Cu, Ag, Au, Pb	Kuroko VMS	Seneca
GA-3	Au, Ag, Pb, Zn, Cu, Cd	Polymetallic veins	Northair
	Au, Ag, Pb, Zn, Cu, Cd	Polymetallic veins	Silver Tunnel
	Ag, Au, Pb, Zn, Cu	Polymetallic veins	Tedi
S-2	Mo, Cu, W, Bi	Porphyry	Gem
	Ni, Cu, Co, Au, Ag, Cr, Pt	Gabbroic Ni-Cu	Pride of Emory
	Ni, Cu	Gabbroic Ni-Cu	Victor
GA-1	Au, Ag, Cu, Zn, Pb, Mo, W	Shear hosted veins	Harrison Gold
	Au, Ag, Cu	Porphyry	Doctor's Point
CPC-20	Au, Ag, Pb, Zn, Cu	Gold-quartz veins	Doratha Morton
	Au, Ag, Cu	Gold-quartz veins	Alexandria
CPC-13	Cu, Mo	Porphyry	O.K.
	Ka, Ge, Ga, In, Cy	Industrial minerals	Lang Bay
	Cu, Mo	Porphyry	Hi-Mars
CPC-5	Au, Ag, Cu, Zn, W	Polymetallic veins	Ashlu
CPC-4	Zn, Ag, Pb	Zn-Pb skarn	Lynn Creek
CPC-30	Fe, Ti, V, Ag	Magmatic magnetite	Wigwam

Commodity abbreviations are: Au-gold, Ag-silver, Bi-bismuth, Cu-copper, Cd-cadmium, Co-cobalt, Cr-chromium, Cy-clay, Fe-iron, Ga-gallium, Ge-germanium, In-indium, Ka-kaolinite, Mo-molybdenum, Ni-nickel, Pb-lead, Pt-platinum, Sb-antimony, Ti-titanium, U-uranium, V-vanadium, W-tungsten, Zn-zinc.

PHASE 1

The phase 1 analysis is a representation of mineral potential based on historical data. Factors such as the number of mineral occurrences recorded in MINFILE, the value of past production, the value of known resources and the amount spent on exploration (from ARIS files) are ranked for each tract. The MINFILE rank is calculated on a per hectare basis. These rank values are weighted to produce the total rank for each mineral assessment tract. A weight of 25 is given to known resources, past exploration work is factored by 10 and the number of mineral occurrences and past production are multiplied by 5 (Kilby, 1995, this volume). Table 3 presents the results of the phase 1 mineral potential analysis for the 61 tracts in the Mid-Coast region arranged from highest to lowest rank.

Figure 5 shows the distribution of mineral assessment tracts with the land base divided into thirds and placed into high, medium and low categories. Readers are reminded that the tracts are ranked relative to each other and that comparisons with tracts in other project areas are not valid. A tract marked "low" mineral potential in Figure 5 means it has lower potential compared to other tracts in the Mid-Coast area. It does not mean the tract has no mineral potential.

Twenty-two tracts in the Mid-Coast area are ranked high potential (Table 3). All but two are located within 200 kilometres of the city of Vancouver. Approximately half of the tracts have well known past-producing mines including Britannia (GA-4), Northair (GA-3), Carolin (M-1) and Treasure Mountain (M-1). All of the currently known resources (for the six metals included in the study) are also located in these high-potential tracts (*i.e.*, Seneca, Harrison Gold, Gambier Island, O.K.; see Table 2). The two anomalous tracts in the northern part of the study area are Klinaklini River (CNC-2) and Aristazabul Island (CPC-36). The Klinaklini River tract ranks high based solely on three occurrences and the value of exploration work conducted on the Hoodoo North and Hoodoo South properties. The Aristazabul Island tract contains three mineral occurrences and has recorded exploration expenditures of approximately $130 000. Both of these tracts have lower topography and easier access compared to most of the northern part of the study area.

All of the mineral assessment tracts ranked as medium contain mineral occurrences or have exploration expenditures recorded for them (Table 3). There are 17 tracts that fit within this category; with the exception of the Vancouver tract (GB-1) they all lie outside the Lower Mainland.

There are 22 tracts in the Mid-Coast area that fit into land base designated as low mineral potential. Fourteen of these are assigned an overall rank of zero based on the number of showings and recorded work. Most are in the northern parts of the project area and all show a strong correlation with the highest topography and the least accessibility.

PHASE 2

Expert estimations for the phase 2 mineral potential analysis have been conducted for the Mid-Coast project area. Preliminary results have yet to be evaluated. In other project areas the phase 2 analysis has not significantly changed the ranking of the land.

TABLE 3. RESULTS OF PHASE 1 MINERAL POTENTIAL ANALYSIS FOR MID-COAST PROJECT

Status	Tract ID	Tract Name	Area (Hectares)	No. of MINFILE	MINFILE Rank	Resource Value	Resource Rank	ARIS Value	ARIS Rank	Production Value	Production Rank	Total Rank
HIGH	GA-4	Britannia	53165	33	58	743729157	61	3285062	61	1285576201	61	2730
	M-1	Manning	110325	118	61	176387535	59	4900942	60	20182068	59	2675
	HL-1	Harrison Lake	135193	44	56	97785036	57	3356463	58	36919	54	2555
	GA-3	Northair	89111	18	47	37957746	54	2239167	59	93052360	60	2475
	S-2	Spuzzum	215969	67	54	176101740	58	1128227	46	22946240	58	2470
	GA-1	Mt. Clarke	160102	16	43	106355200	56	2771951	57	420126	55	2460
	CPC-20	Loughborough Inlet	97937	27	52	6826199	52	1552022	56	2236677	57	2405
	CPC-13	*Powell River*	*145260*	*37*	*51*	*1627180000*	*60*	*2264256*	*55*	*0*	*0*	*2305*
	CPC-5	Cloudburst	132513	14	44	11302775	53	588447	44	2732355	56	2265
	CPC-4	Cypress Bowl	86713	15	45	50620830	55	119050	38	0	0	1980
	S-1	Chilliwack	63299	47	60	0	0	627004	51	0	0	810
	Q-1	Spences Bridge	98478	32	55	0	0	1250513	53	0	0	805
	GA-2	Fire Lake	86824	18	49	0	0	1140810	54	0	0	785
	BR-1	Hozameen	109067	68	59	0	0	667993	47	0	0	765
	CH-1	Bridal Falls	84186	33	57	0	0	597225	48	0	0	765
	CPC-7	Bowen Island	104609	31	53	0	0	971728	50	0	0	765
	CD-1	Breakenridge	108440	23	50	0	0	843063	49	0	0	740
	CNC-2	Klinaklini River	85293	3	34	0	0	882907	52	0	0	690
	CPC-14	Bute Inlet	99458	19	46	0	0	503341	45	0	0	680
	CPC-1	Pitt Lake	232841	23	42	0	0	428877	41	0	0	620
	CPC-8	Jervis Inlet	209880	15	40	0	0	312183	39	0	0	590
	CPC-36	Aristazabal Island	73408	3	38	0	0	129685	40	0	0	590
MEDIUM	GA-6	Bella Coola	340866	9	31	0	0	674013	42	0	0	575
	CPC-33	Cape Caution	81895	2	29	0	0	226491	43	0	0	575
	CPC-19	Surge Narrows	43449	9	48	0	0	23506	33	0	0	570
	CPC-3	Sampson-Delilah	78274	3	36	0	0	74719	36	0	0	540
	CPC-10	Toba Inlet	299455	11	35	0	0	225844	34	0	0	515
	CPC-30	Seymour Inlet	155835	6	37	0	0	74452	32	0	0	505
	CPC-2	Meagher Creek	260635	5	25	0	0	226065	35	0	0	475
	CPC-32	Roderick Island	144915	4	32	0	0	33219	30	0	0	460
	CPC-27	Kwatna River	109800	1	18	0	0	136360	37	0	0	460
	CPC-31	Namu	134289	3	27	0	0	14845	28	0	0	415
	CPC-24	Wakeman River	89064	2	28	0	0	9840	27	0	0	410
	CPC-15	Knight Inlet	146135	1	16	0	0	40063	31	0	0	390
	CPC-34	Bella Bella	127358	2	24	0	0	6906	26	0	0	380
	CNC-5	South Bentick Arm	102384	1	20	0	0	5309	25	0	0	350
	CPC-18	Kimsquit	214607	2	19	0	0	2242	24	0	0	335
	CPC-21	Kingcome River	167285	0	0	0	0	20180	29	0	0	290
	GB-1	Vancouver	175981	17	41	0	0	0	0	0	0	205
LOW	CNC-7	Rivers Inlet	155953	8	39	0	0	0	0	0	0	195
	CPC-22	Tezwa River	104739	3	33	0	0	0	0	0	0	165
	CNC-6	Nascall River	117034	3	30	0	0	0	0	0	0	150
	CPC-12	Atnarko	51769	1	26	0	0	0	0	0	0	130
	ST-1	Tweedsmuir	154585	2	23	0	0	0	0	0	0	115
	CPC-11	Superb Mountain	173371	2	22	0	0	0	0	0	0	110
	CPC-28	Ocean Falls	191301	2	21	0	0	0	0	0	0	105
	CPC-23	Gilford Island	236071	2	17	0	0	0	0	0	0	85
	CPC-9	Big Julie	73306	0	0	0	0	0	0	0	0	0
	CNC-3	Knot Creek	44786	0	0	0	0	0	0	0	0	0
	CPC-26	Amback	35616	0	0	0	0	0	0	0	0	0
	G-1	Silverthrone Mtn.	28846	0	0	0	0	0	0	0	0	0
	CPC-6	Clendenning	118636	0	0	0	0	0	0	0	0	0
	CPC-29	Sheep Passage	60268	0	0	0	0	0	0	0	0	0
	A-1	Anahim	33591	0	0	0	0	0	0	0	0	0
	CPC-16	Tumult Glacier	79608	0	0	0	0	0	0	0	0	0
	CPC-25	Doos Creek	159214	0	0	0	0	0	0	0	0	0
	CNC-1	Princess Louisa	58549	0	0	0	0	0	0	0	0	0
	GA-5	Monarch	92540	0	0	0	0	0	0	0	0	0
	CPC-35	Princess Royal	137053	0	0	0	0	0	0	0	0	0
	CNC-4	Owikeno Lake	205392	0	0	0	0	0	0	0	0	0
	CPC-17	Sheemahant River	97506	0	0	0	0	0	0	0	0	0

Tracts are arranged from highest to lowest total rank of mineral potential. Values for resources, production and exploration expenditures (ARIS) are in 1986 dollars. The rank of known resources is given a weight of 25, the rank of past work is factored by 10 and MINFILE and past-production ranks are multiplied by 5. The sum of these four ranks yields the total rank for each tract. One third of the total land base (by area) is placed in high, medium and low mineral potential categories.

DISCUSSION

Historically, exploration and research have been focused in the southern areas of the Mid-Coast region. Geological compilation (Bellefontaine and Alldrick, 1994) has demonstrated that many of the terranes maintain their integrity even through abundant intrusive rocks of the Coast Belt. This suggests that rock units in the northern areas should have similar mineral potential to their southern counterparts. However, due to the lack of recorded exploration and the paucity of data in the northern areas, most of the southern Mid-Coast region ranks high in the phase 1 mineral potential analysis.

Ideally, estimations by experts for the phase 2 analysis should capture a wide range of thinking on the future mineral potential of this little known region of the province. Although phase 2 has not significantly changed the ranks of tracts in other study areas, in no region has the lack of available expertise for estimations been as large as in the Mid-Coast project area.

There are approximately 600 mineral occurrences in the Mid-Coast region; 80% of them occur within 200 kilometres of Vancouver. Similarly, there are 101 present or past producers in the project area; 83% are located within 200 kilometres of Vancouver. The northward geological continuity and lack of previous exploration work in the northern part of the Mid-Coast area highlights the potential for exploration opportunities.

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