DATE: January 16, 2003 **cc:** Gary Pearson

TO: Al Mowat, Perry Heatherington – Emerald Fields Resource Corp.

FROM: Sean McKinley, M.Sc.

RE: **Port Renfrew, B.C. Ni-PGE property**

The following is a summary of information pertaining to the Port Renfrew claim block that I have gained first hand from two personal visits to the property, from discussions with Gary Pearson and from research on the internet. The claims discussed in this report comprise those held by Emerald Fields and Mr. Gary Pearson (and associates) as well as the immediate surroundings.

Location

The community of Port Renfrew is located on the southwest coast of Vancouver Island approximately 100km WNW from the city of Victoria. The Emerald Fields/Pearson claims are located near Port Renfrew north of the San Juan River in the vicinity of Gordon River, Fairy Creek and Granite Creek. The roughly rectangular claim block is approximately 25km east to west by approximately 10 km north to south. The area comprises some quite rugged and steep topography, heavy west coast rain forest vegetation, second-growth forests and logging clear-cuts. Despite the remote and rugged location, the area is relatively easily accessed via a network of logging roads which also provide some excellent geological exposures.

Geology

The geology of southwestern Vancouver Island is composed of three distinctly different terranes: 1) Mesozoic and older volcano-sedimentary rocks (and their metamorphosed equivalents) of the Wrangellia Terrane, 2) Mesozoic volcano-sedimentary rocks of the Pacific Rim Terrane (including the mostly sedimentary Leech River Complex), and 3) the Tertiary volcanics of the Crescent Terrane (including the ophiolitic Metchosin Igneous Complex). The older rocks of Wrangellia were thrust against the younger Leech River rocks along the San Juan Fault which runs roughly east-west from Port Renfrew to Cobble Hill. The Leech River Complex (Pacific Rim Terrane) was thrust onto the younger Crescent Terrane rocks along the Leech River Fault. This obduction was accompanied by a magmatic event between 40 and 50 Ma ago.

The area in question north of the San Juan River has been mapped in the past as predominantly a mixture of rocks from the West Coast Complex and the younger Island Plutonic Complex. Individual lithologies include undifferentiated Paleozoic to Jurassic intrusive rocks of the West Coast Complex and early to middle Jurassic granodioritic intrusive rocks of the Island Intrusive Suite. Lesser lithologies in the claim block include Triassic volcanics of the Karmutsen Formation and undivided Triassic sedimentary rocks of the Vancouver Group. More extensive areas of Karmutsen basalts and Jurassic Bonanza volcanics are found north of the claim block. To the south of the

claim block, and separated from the rocks described above by the San Juan Fault are Jurassic to Cretaceous age metasediments of the Leech River Complex.

Mineralization

In the past 30 to 40 years, this area has received considerable exploration attention by companies (including Noranda, 1960s) searching for skarn-type Fe and/or Cu deposits. Skarn deposits are a logical exploration target here given the presence of both limestones and intrusive rocks. Indeed numerous skarn zones have been identified including a number of bodies of massive sulphide (pyrrhotite, chalcopyrite +/- magnetite, pyrite). The most significant of these occurrences are perhaps the Reko deposits (MINFILE nos. 092C090, -091, -110 and –146; discussed below). Other occurrences of what is reported as skarn Fe/magnetite from within the claim block include the following: Bugaboo (MINFILE 092C022), David (092C023), Elijah (092C024), Sirdar (092C025), Baden Powell (092C027) and Rose/Thorn (092C030). Little or no reporting of Ni and/or PGE exploration exists for this area. Published geochemical data usually only includes analyses for Fe, Cu and/or gold.

Disseminated to net-texture pyrrhotite with lesser pyrite and chalcopyrite is quite common in the ultramafic rocks on the claim block. However, exposures of semi-massive to massive sulphides were observed on the Fairy Main and Granite Creek Main logging roads. The latter was the more impressive of the two, comprising a several metre-wide outcrop of massive pyrrhotite with blebs of chalcopyrite; the true extent of this mineralization was not exposed. This mineralization was documented by Reako Explorations Ltd. during their exploration in the 1970s. They interpreted the sulphides to be skarns. However, given their close association to cumulate rocks, the possibility exists that the sulphides are of magmatic origin. This would be a highly important divergence in geological interpretation. Past assays of this mineralization did not show significant Ni or PGE contents, but this by no means precludes the existence of a PGE-bearing reef in the area. In fact, during the 1980s, prospector Matti Tavela discovered several pieces of mineralized float in the area between Fairy and Granite Creeks, several kilometres to the southwest of the massive pyrrhotite occurrences. Two of these samples graded 0.5% Ni, 0.6% Cu, 0.07-0.1% Co and >200ppb Pd. A third sample graded 0.66% Ni, 0.25% Cu, 0.07% Co, 75ppb Pt and 520ppb Pd. Follow-up prospecting by Mr. Pearson confirmed the presence of the mineralized float. Mr. Pearson has extensively sampled this belt of ultramafic rocks and has returned many assays in excess of several hundred ppb Pt+Pd.

Regional Geochemistry

The B.C. Ministry of Energy and Mines conducts regional reconnaissance-scale stream sediment and water geochemical surveys (RGS). The samples are analysed for numerous elements including Au, Ag, Cu, Pb, Zn and Ni (Note: PGEs are not reported in the datasets). This data is available on the Ministry website. Approximately 20 of these samples have been taken from within the claim block with numerous more existing in the surrounding areas. Of particular note to this project are the numerous RGS samples that are anomalous in Ni (>90th percentile) within and close to the claim block. These are particularly prevalent in the eastern parts of the claim block. The most anomalous sample lies on Tenure No. 392327 which is held by Harley Haugen.

However, the stream from which this sample was taken drains, and therefore possibly has sampled, rocks from claims held by Emerald Fields (i.e. Tenure 394703 and 394704). This anomalous sample (RGS ID 92C891386) contained 157 ppm Ni and 426 ppm Cr (It is not clear at this time if these numbers are reflecting the inherent higher amounts of Ni and Cr in the ultramafic rocks of the area or correspond to mineralization). Although many of the RGS samples within the claim block did not yield particularly high Ni values, a large number of streams remain unsampled, as well as the upstream portions of the sampled streams (usually only one sample was taken from one stream). Also of note are two additional anomalous samples (RGS ID 92C891326 and 92C891332) located approximately 4 km to the northeast of the claim block. These samples contain 169 and 93 ppm Ni respectively and 426 and 202 ppm Cr respectively. According to the government maps, these samples lie within an area underlain by Triassic Karmutsen basalts and undivided sediments.

Recent Exploration

In the past two years Mr. Gary Pearson encountered many occurrences of what he identified as ultramafic rocks. This would not normally be very unusual as they might, at a first pass, be identified as migmatized mafic/ultramafic volcanics forming part of the West Coast Complex. However, following a visit to the area, by Dr. Dante Canil, an igneous petrologist from the University of Victoria, identified these rocks as **cumulate peridotites** having 25-35% fresh olivine surrounded by 60-70% oikocrystic orthopyroxene. A total of 12 specimens from the area were confirmed to be cumulate peridotite. Mr. Pearson has since identified over 30 peridotite bodies in the area. Additional samples have been analysed by Vancouver Petrographics and some of these have been confirmed to be ultramafic in composition. The occurrence of these ultramafic rocks corresponds quite closely to a strong aero-magnetic high. This aeromag high trends roughly east-west and in the study has dimensions of 25-30km by 5-10km for a total area of approximately 250km^2.

Discussion

Ultramafic rocks, and particularly cumulate ultramafics, are significant as they are associated with layered intrusions such as the Bushveld and Stillwater Complexes which host major PGE deposits. The peridotites in this area may have been misidentified or underidentified in the past since they tend to be more easily eroded or weathered than the nearby granitoid rocks. Although only a very loosely based observation, from my visit it appeared that the peridotites were more prevalent on the middle to lower slopes of the ridges and mountains and that they graded (?) into more gabbroic and granitic rocks upwards. Given that the higher peaks in this area are over 1100 metres in elevation it seems reasonable that a thickness in excess of 500 metres of peridotite is exposed; this, however, gives no indication of their extent at depth.

Several researchers have documented the usefulness of Cu/Pd ratios as a prospecting tool for reef-style PGE mineralization within ultramafic rocks. These authors suggest that Cu/Pd ratios greater than 10,000 (i.e. mantle composition) suggest that the rocks are relatively PGE-depleted and therefore enrichments of these metals may occur at depth. Ultramafic complexes such as those above the Merensky Reef in South Africa or the Munni Munni Complex in Australia show this PGE depletion above the ore-grade

PGE reefs. Preliminary examination of the data collected by Mr. Pearson indicate that the Cu/Pd ratios for the peridotites in this area often exceed 15,000 and locally exceed 50,000. Using the PGE reef/layered intrusive model, this would indicate that the exposed peridotites are relatively PGE-depleted and that PGE enrichments may exist at depth.

Conclusions and Recommendations

The identification of previously unknown cumulate ultramafic rocks is in itself quite an exciting development from a mineral exploration point of view given their close association with Ni-PGE deposits. However, the discovery of these rocks and their extensive occurrence along with the occurrence of known massive sulphides, mineralized float enriched in Ni, Cu, Co, Pt and Pd, and the apparent existence of PGE-depleted rocks would suggest that this geological environment is highly prospective for Ni-PGE mineralization. This is potentially an unprecedented discovery for Vancouver Island and possibly even for all of British Columbia. Although there are known enrichments of Ni +/- Co +/- Pd associated with mineralization in the Eocene Sooke Gabbro (e.g. Sunro/Jordan River Deposit; Willow Grouse prospect), no known economic Ni-PGE deposits exist in this region as yet (Note: the distinctive fresh nature of the olivine as reported by Dr. Canil (G. Pearson, pers. comm.) may indicate that these ultramafic rocks are much younger than the surrounding Paleozoic to Jurassic rocks i.e. they may be related to the obduction of the Metchosin volcanics that are more common to the south. One reason for the lack of known Ni-PGE prospects in the region may be a lack of a concerted exploration effort in the past; most of the previous exploration was aimed at Cu, Au or skarn-Fe deposits and Ni and PGEs seem to have been largely ignored.

A number of questions and problems need to be addressed to advance this property. These include the following:

- Geological model for emplacement of the ultramafic rocks – the relative age and intrusive relationships of the ultramafic rocks and the surrounding rocks should be determined; is there any evidence for a layered intrusion ?; the regional extents of the ultramafic rocks should be defined; this information should be used to conclude if this package of rocks is favourable for Ni-PGE mineralization.
- Mode of occurrence of massive pyrrhotite-chalcopyrite showing on Reko claims – are the sulphides skarn-related or magmatic in origin ?
- Source of Ni-Cu-Co-rich float at Ebb showing
- Source of geochemical RGS anomalies

In order to advance the property, a two-phase approach is recommended. This program will involve an initial, reconnaissance-style geological and geochemical study to evaluate the property with a more intensive follow-up if warranted.

Phase 1 will involve the following:

- Data gathering – geological data, reports and maps from all sources will be gathered and studied; where possible, all data will be converted to digital form for future plotting and interpretation.
- Geological assessment - a first-pass mapping, sampling and digitizing of roadcuts and easily accessible outcrops on the property will be carried out to determine the various lithologies present and their distributions; it will be important at this stage to bring in an expert(s) on magmatic sulphide deposits (e.g. Dr. Hulbert, GSC) to help determine if the property geology is permissive for Ni-PGE deposits; age-dating of the intrusive suite(s) may be a useful endeavour at this stage.
- Geochemical survey – a stream sediment/heavy mineral sampling program should be carried out to follow-up on known RGS anomalies and to fill-in unsampled drainages in the area; this will help to define future targets for further geological and geochemical work.
- Outcrop stripping/trenching of known zones of mineralization will be important in the determination of the mode of sulphide occurrences.

I believe that this work could be carried out for under $100,000 depending on the size of geochemical sampling program desired and the accessibility of sample sites (the need for a helicopter would obviously adversely affect this). This should be sufficient expenditure to secure all of the claims in good standing for at least an additional year.

Phase 2 would be largely dependent on the results of Phase 1. If the stream sampling program yielded sufficient new anomalies and targets and the geological work suggested the environment was still favourable for Ni-PGE mineralization, then a follow-up geological and geochemical program would be recommended to outline potential drill targets. If this follow-up work was successful then a drill program would be the obvious next step. Expenditures for Phase 2 are very difficult to estimate due to the fact that should the program reach the drilling phase, costs would be most greatly influenced by the location of the drill targets and the possible need for helicopter support versus road access.

I believe it is feasible for an aggressively implemented program to reach the drilling stage of Phase 2 within one exploration season. However, it may be more prudent to implement Phase 1 and some of the follow-up work of Phase 2 in the first year and carry out further follow-up and possible drilling in the second year.