

Table 4: Summary geological, mineral and geochemical data for selected areas of potential for subaqueous hot-spring deposits in British Columbia. Areas are outlined on Maps 1 and 2. References in Appendix 4.

	NAME	GEOLOGY	MINERAL DEPOSITS	RGS ANOMALIES	REFERENCES	COMMENTS
A1	Hankin Peak	uTrS Stuhinni Group: volcanic derived sediments (siltstone, feldspathic sandstone, greywacke, augite bearing greywacke), limestone, lesser augite-phyric flows and tuffs (<i>More Creek sedimentary facies</i>) ImJH Hazleton Group: siltstone and sandstone; subaerial to submarine massive rhyolite, andesite flows and tuffs (<i>Unuk River, Betty Creek, Mt Dilworth fms</i>); siltstone, bimodal pillow basalt, tuff and breccia (<i>Salmon River Fm - Eskay Creek facies</i>).	Porphyry Cu-Au mineralization (Little Les, Biskut). Polymetallic subvolcanic veins (Forgold) and silicified shears (Mal, Snoball). No VMS deposits. Polymetallic sub-volcanic veins (GOZ/RDN) may be Eskay related.	Significant multielement anomalies along tributaries to More and Bull creeks. Sparse moderate anomalies in northern part of area.	Souther, 1972 Logan et al., 1997	Area borders Mt Edziza Park; significant ice cover around Hankin Peak.
A2	Eskay-Sulphurets	ImJH Hazleton Group: subaerial and submarine andesite pyroclastics and flows, turbiditic tuffaceous sandstones and conglomerate, plag-Kspar-hornblende porphyry (<i>Unuk River Fm</i>); subaerial-submarine andesite to dacite tuffs and flows, volcanic sediments (<i>Betty Creek Fm</i>); thin subaerial felsic pyroclastics (<i>Mt Dilworth Fm</i>); siltstone, shale, limestone, pillow lava and breccia (<i>Salmon River Fm - Eskay Creek facies</i>).	Type area for Eskay-type VMS with 8 deposits (eg Eskay Creek, Corey); numerous deposits of both high- and low-sulphidation Au-Ag epithermal type (e.g. Brucejack Lake, Treaty Glacier), plus porphyry mineralization, are of early Jurassic age.	Numerous high multi-element anomalies spatially related to both Eskay-type deposits and epithermal deposits (eg Sulphurets). Anomalies in TrS related to porphyry deposits (eg Kerr).	Britton et al., 1989 Britton et al., 1990 Grove, 1986 Anderson & Thorkleson, 1990 MacDonald et al., 1996	Eskay Creek deposit hosted in lower Salmon River Fm.
A3	Stewart-Salmon River	ImJH Hazleton Group: dominantly subaerial andesite pyroclastics and flows, turbiditic siltstone, plag-Kspar-hornblende porphyry (<i>Unuk River Fm</i>); subaerial andesite to dacite tuffs and flows, volcanic sediments (<i>Betty Creek Fm</i>); thin subaerial felsic pyroclastics (<i>Mt Dilworth Fm</i>); interbedded black cherty radiolarian-bearing shale and white tuff, minor limestone, conglomerate (<i>Salmon River Fm - Troy Ridge facies</i>).	2 possible Eskay-type deposits (Delta North, 4-J) in Salmon River Fm; several ?Kuroko type VMS in cherty iron formation at top of ?Unuk River (e.g. George Gold, Vet). Numerous Jurassic-age Au-pyrrhotite (Scottie Gold) and Au-Ag-base metal veins (Big Missouri, Silbak Premier), as well as Eocene Ag-Pb-Zn veins (e.g. Prosperity-Porter Idaho).	Numerous high and moderate multi-element anomalies probably related to epithermal vein deposits (104B, 103P). No RGS for 104A.	Alldrick, 1993 Britton and Alldrick, 1988 Greig et al., 1994 Anderson & Thorkleson, 1990 Grove, 1986	Significant ice cover in higher parts of area.
A4	Alice Arm	<i>Kitsault</i> : ImJH Hazleton Group: subaqueous, andesitic tuffs and breccia, flows, minor limestone, siltstone, sandstone, chert (<i>Unuk River Fm</i>); volcanic breccia and conglomerate, siltstone, sandstone (<i>Betty Creek Fm</i>); dacitic flows, tuffs and lapilli tuffs ?waterlain (<i>Mt Dilworth</i>); siliceous siltstone, sandstone, wackes, minor limestone, conglomerate (<i>Salmon River Fm</i>). <i>Anyox pendant</i> : ?Tr/J: pillowed and massive tholeiitic basalt, breccia, minor tuffs; saccharoidal meta-chert (? <i>Salmon River Fm - Eskay Creek facies</i>); flysch - shales and siltstone, minor limestone and coarse clastics (? <i>Bowser Lake Group</i>). <i>Georgie River "pendant"</i> : ?ImJH Hazleton Group: massive to pillowed basalt to andesite flows, coarse volcanic conglomerate, breccia, sandstone, minor siltstone and felsic tuff; pyritic siltstone and shale, minor volcanic sandstone; massive ?subaqueous rhyolite flows, breccia, conglomerate.	<i>Kitsault</i> : one possible Eskay type (Left Over) plus possible ?Kuroko-type VMS (Sault) and Jurassic-age epithermal Ag-Pb-Zn veins (Torbrit, Dolly Varden) in Unuk River Fm. Shear-hosted base-metal veins in Illiance River area <i>Anyox</i> : numerous lenses of Cyprus-type VMS (eg Hidden Creek). <i>Georgie River</i> : Au-base metal quartz veins probably Eocene age.	<i>Kitsault</i> : Numerous high and moderate multi-element anomalies within and peripheral to Hazleton rocks. <i>Anyox</i> : one multielement anomaly and several single element anomalies but peripheral to volcanic outcrop area. <i>Georgie River</i> : moderate multi-element anomalies on SE periphery (along Sutton River)	Alldrick, D.J., 1986 Dawson & Alldrick, 1986 Greig, 1992 Devlin and Godwin, 1986 Evenchick and Holm, 1997 Evenchick and Snyder, 1999.	

A5	Houston-Babine	ImJH Hazleton Group (<i>Telkwa Fm</i>) - subaerial calc-alkaline andesitic pyroclastics; amygdaloidal basaltic flows and tuff; siliceous pyroclastics (<i>Howson facies</i>). Overlain by IJ <i>Nilkitkwa Fm</i> - rare black shale, limestone and greywacke; and, E of Babine Lake, predominantly subaerial ImJ <i>Saddle Hill volcanics</i> - rhyolite flows and pyroclastics; basalt flows, breccia and tuff; and feldspathic tuffs, minor marine sediments.	3 VMS deposits at or near Telkwa/Nilkitkwa contact - Ascot and Del Santo contain tetrahedrite. Numerous epigenetic polymetallic quartz veins (Cu-Zn-Pb-Ag-As) of several generations (Jurassic - Tertiary) hosted in sheared volcanics and intrusions (Grouse Mtn, Dome Mtn). Porphyry Cu-Mo deposits (eg Graniele).	Highly anomalous multi-element RGS anomalies related to Dome Mtn and ?Mt Cronin. Several single element Ag anomalies in south. No anomalies in eastern part of the area.	Tipper & Richards, 1976 MacIntyre et al., 1987 MacIntyre et al., 1989 MacIntyre et al., 1996 MacIntyre et al., 1997 Wojdak, 1999	Telkwa Fm basalt flows preferred host for Cu-Ag veins Saddle Hill volcs = ?Mt Dilworth + Salmon River fms (same age, bimodal) though subaerial
A6	Bait-Sikanni Ranges	ImJH Hazleton Group (<i>Telkwa Fm</i>) - dominantly intermediate calcalkaline pyroclastics and flows, basalt common, rhyolite rare, subaerial (<i>Bear Lake facies</i>); basalt-andesite amygdaloidal flows, pillowed flows, breccia, tuffs, limestone lenses, shale, greywacke, submarine (<i>Katsine facies</i>); well-bedded pyroclastics and coarse sediments, dominantly intermediate-felsic, subaerial (<i>Sikanni facies</i>); Overlain by submarine IJ <i>Nilkitkwa Fm</i> - pelite, greywacke, tuffaceous sediments, andesite-rhyolite tuff, basaltic volcanic members.	One gold-rich Kuroko-style VMS (Day-Porcupine Zone). Numerous Cu occurrences - either porphyry-Cu related or volcanic redbed Cu.	Several moderate multi-element anomalies.	Richards, 1976 Tipper & Richards, 1976	?Nilkitkwa correlative with Mt Dilworth + Salmon River fms in Eskay area 93M 141 - stockwork py-sp-gn in submarine Nilkitkwa. RGS anomalies include epi-elements but not recorded in deposits!
B1	Taku River	CPS Stikine Assemblage (<i>Mt Eaton suite</i>): massive to brecciated mafic flows, felsic flows, breccia, volcanoclastics, massive limestone (lower division); augite-plagioclase phyric breccia, agglomerate, tuff, volcanic turbidite (middle division); volcanic conglomerate and sandstone, coarse debris flows, tuffs, volcanogenic turbidites, pillowed K-spar basalt, intermediate to mafic, breccia and flows, limestone (upper division). uTrS Stuhinni Group: conglomerate, argillite; subaqueous augite-phyric tuff, flows, breccia, pillowed flows, hyaloclastite, heterolithic lapilli tuff; massive limestone; coarse debris flows, volcanic sandstone, calcareous siltstone, argillite, greywacke and grit (<i>King Salmon fm</i>).	Precious metal-rich Kuroko-type VMS hosted in Stikine Assemblage lower division rocks (Tulsequah Chief, Big Bull); ?Jurassic mesothermal Au-quartz veins (Polaris Taku). Eocene epithermal veining common.	Many high and moderate multi-element anomalies in the area including areas underlain by uTrS rocks; ?related to Eocene epithermal mineralization.	Mihalynuk et al., 1994 Mihalynuk et al., 1995 Souther, 1971 Sherlock et al., 1996	BWM not VMS (though still ?Eskay related) - breccia pipe, epithermal, age uncertain. Ericksen-Ashby - Kuroko type VMS or skarn?
B2	Telegraph Creek	uTrS Stuhinni Group: subaqueous to subaerial mafic pyroxene-phyric tuffs, breccia, massive and pillowed flows, bladed feldspar porphyry, andesitic tuffs and flows, conglomerate, tuffaceous wacke, siltstone, minor limestone. ImJH Hazleton Group: subaerial to submarine massive andesite flows and tuffs, breccia, siltstone, wacke, felsic flows and tuff.	Mesothermal and porphyry-Cu related base and precious metal veins; One gold-rich ?VMS/vein in uTrS (Tuff).	One high (S of Barrington River) and a few scattered moderate multi-element anomalies; several single element precious metal anomalies. No RGS for 104J.	Brown & Greig, 1990 Brown et al., 1992 Gabrielse, 1977 Souther, 1959 Souther, 1972	ImJH restricted in outcrop (Mt Kirk-Helveker Creek). Note: No MINFILE shown in area of RGS multi-element high!!
B3	Spatsizi Plateau	ImJH Hazleton Group: subaerial basalt to andesite flows and breccias, intermediate-felsic tuff and sills (<i>Griffith Creek volcs</i>); marine and subaerial, bimodal alkaline to tholeiitic mafic flows, rhyolite tuff and sills (<i>Cold Fish volcs</i>); marine fine-grained clastic sediments (<i>Spatsizi Fm</i>); subaerial mafic flows, felsic volcanoclastics (<i>Mount Brock volcs</i>).	No VMS. Several occurrences of Jurassic age, intrusion-related porphyry Cu-Au mineralization hosted in Triassic and Jurassic rocks (Red Chris, Edon, Rose of Klappan).	Several multi-element (epi + prec) anomalies in western part of area. No RGS data for 104H.	Souther, 1972 Evenchick & Thorkleson, 1993 Ash et al., 1997 Marsden & Thorkleson, 1992	Area includes Spatsizi Plateau Wilderness Park.

B4	Iskut River	<p>uTrS Stuhinni Group: submarine mafic-intermediate, plagioclase-hornblende-phyric flows, breccia, tuff, wacke, conglomerate and limestone; submarine pyroxene-phyric volcanics and turbiditic sediments; subaerial alkalic flows, tuffs and epiclastics.</p> <p>ImJH Hazleton Group: intermediate-felsic tuffs, lapilli tuffs, agglomerate, volcanic conglomerate, wacke and siltstone (<i>Unuk River, Betty Creek fms</i>); subaerial felsic tuffs, lapilli tuffs, siltstone (<i>?Betty Creek, Mt Dilworth fms</i>)</p>	<p>One precious-metal enriched VMS (Rock & Roll) ?Besshi-type; alkalic porphyry-Cu (Galore Creek) deposits in northern part; variety of mesothermal (Tr-J) gold-base-metal veins (Johnny Mt, Snip).</p> <p>Mesothermal gold-base-metal veins (Inel).</p>	<p>A few moderate multi-element anomalies, scattered single element precious metal anomalies.</p> <p>No RGS anomalies. (?sample distribution)</p>	<p>Britton et al., 1990 Anderson & Thorkleson, 1990 Logan & Koyanagi, 1994</p>	<p>Extensive ice cover at higher elevations No RGS anomaly around Rock and Roll. Correlation uncertain. ? if Salmon River Fm (Snippaker Mtn facies).</p>
B5	Bulkley Ranges	<p>ImJH Hazleton Group (<i>Telkwa Fm</i>) - calc-alkaline andesitic subaerial pyroclastics; amygdaloidal mafic flows; felsic flows, domes and pyroclastics (<i>Howson facies</i>). Overlain by <i>Nilkitkwa Fm</i> - black shale, limestone and greywacke; non-marine red tuff, volcanic sediments and marls (<i>Red Tuff Mbr = Eagle Peak Fm</i>).</p>	<p>VMS mineralization limited to the Kitimat area (Bow Byes); ubiquitous epigenetic polymetallic quartz veins (Cu-Zn-Pb-Ag-As) of several generations (Jurassic - Tertiary) hosted in sheared volcanics and intrusions. Some may be related to porphyry Cu-Mo showings.</p>	<p>Numerous moderate multi-element anomalies throughout the area. Probably relate to the extensive epigenetic mineralization</p>	<p>Tipper & Richards, 1976 Duffell & Souther, 1964 Gareau et al., 1997 MacIntyre et al., 1989 Desjardins et al., 1990</p>	<p>?Eagle Peak Fm (Red Tuff Mbr) is equivalent to Mt Dilworth. Subaerial, however. Telkwa Fm basalt flows preferred host for Cu-Ag veins</p>
B6	Tahtsa-Whitesail	<p>ImJH Hazleton Group (<i>Telkwa Fm</i>) - dominantly subaerial andesitic pyroclastics, lesser mafic-felsic flows (shallow submarine in Michel Lake area, 93E/10). Overlain by subaerial to submarine felsic volcanics and chert (<i>"Whitesail Fm"</i>).</p>	<p>Only one possible Kuroko-style VMS (Poor Sam); quartz-basemetal-gold veins, some with tetrahedrite, occupy northeasterly trending faults (?Tertiary).</p>	<p>One highly anomalous and several moderately anomalous multi-element RGS anomalies throughout the area.</p>	<p>MacIntyre, 1985 Diakow & Mihalyuk, 1987 Diakow & Koyanagi, 1988 Diakow & Drobe, 1989 Diakow, 1990</p>	<p>Generally porphyry-Cu and epigenetic quartz-Au country. Host of Poor Sam uncertain (?Kasalka).</p>
B7	Adam's Lake	<p>Middle Devonian to Mississippian Eagle Bay Assemblage: units <i>EBA</i> - felsic to intermediate metavolcanics (chlorite-sericite-quartz phyllite and schist), local mafic metavolcanics (chlorite schist), minor metasediments (phyllite and siltstone); and <i>EBF</i> - intermediate feldspathic metatuff and metabreccia. Calc-alkaline to alkaline. Probably submarine.</p>	<p>Numerous Kuroko-type VMS and base-metal veins in units EBA and EBF including precious metal-rich deposits (e.g. Rea Gold, Homestake). U-Th-F-pyrite replacements in EBF. No epithermal mineralization though several deposits contain tetrahedrite +/- argentite or ruby silver (Homestake, Rea Gold, Samotosun).</p>	<p>A few moderate multi-element anomalies (in area of Rea-Samotosun-Homestake), several single element precious or base-metal anomalies. No Hg data.</p>	<p>Schiarizza & Preto, 1987 Höy, 1999</p>	<p>One highly anomalous RGS sample probably related to Fennell Fm or Blackpool fault. No Epi min, ?Homestake-Rea area - deposits all show some epi character.</p>
B8	Bella Coola	<p>ImJH Hazleton Group: "<i>Hotnarko volcanics</i>" - marine to non-marine volcanoclastics, flows, breccias and intercalated shales and volcanic sandstones. Bimodal - predominantly mafic-intermediate, minor rhyolite, ?calc-alkaline.</p> <p>(Includes pendants formerly mapped as Gambier Group)</p>	<p>Area is poorly explored. Two VMS prospects (Nifty, Keen) show some Eskay Creek-type characteristics.</p>	<p>No RGS data available.</p>	<p>van der Hayden, 1990 van der Hayden, 1991 Ray et al., 1998 Baer, 1973</p>	<p>Area adjacent to Tweedsmuir Park Area is poorly mapped and understood. Volcanics ?time equivalent to Salmon River +/- Ashman fms, though one eJ age date. Mid-Coast RGS (1999) may include this area.</p>
B9	Nechako River	<p>ImJH Hazleton Group: <i>Entiako Fm</i> - deep to near-shore, mudstone, arkosic sandstone, sharpstone conglomerate, subaerial rhyolite flows, tuffs and lapilli tuff, minor mafic lapilli tuff; <i>Naglico Fm</i> - augite-phyric mafic flows, tuffs, breccia, scarce marine volcanic sediments, tholeiitic to calc-alkaline (previously mapped as uTrS).</p>	<p>Epithermal mineralization of Late Cretaceous and Tertiary age. No massive sulphides.</p>	<p>No RGS data available.</p> <p>Till and lake sediment data available for parts of area. Anomalies can be related to epithermal mineralization.</p>	<p>Diakow et al., 1997 Anderson & Snyder, 1998 Anderson et al., 1998 Struik et al., 1999 Lane & Schroeter, 1997</p>	<p>Age equivalents to Salmon River & ?Nilkitkwa fms. Nomenclature being revised.</p>

C1	Tatsamenie Lake	CPS Stikine Assemblage: chloritic intermediate metavolcanics, tuffs and flows, feldspar and augite-phyric tuffs and flows, rare pillow basalt, argillite; felsic-intermediate tuff, tuffaceous sandstone and argillite, local conglomerate; slate, phyllite, minor siltstone, limestone; felsic phyllitic metatuff, chloritic intermediate to mafic metavolcanics, dolomite, marble, phyllite; limestone, crinoidal limestone, carbonaceous limestone. uTrS Stuhinni Group: mafic-intermediate augite-plagioclase pyroclastics, flows and sills, volcanic turbidites, pillow basalt, minor limestone, chert, conglomerate.	No known VMS, though stratabound pyritic alteration zones occur in Stikine Assemblage volcanic rocks; Jurassic and Tertiary epithermal veining (Au +/- base-metals) in silicified zones in Stikine Assemblage limestone (Golden Bear, Fleece); quartz-base metal veins occur in Stuhinni Group volcanics (Bandit, Honk).	Scattered high and moderate multi and single element anomalies. Appear to be peripheral to intrusions.	Bradford & Brown, 1993 Souther, 1971 Oliver & Hodgson, 1990	
C2	Toodoggone	ImJH Hazleton Group (<i>Toodoggone Fm</i>) - interstratified, dominantly intermediate to felsic, high-K calcalkaline flows and pyroclastics in 2 volcanic cycles. Subaerial; rare late submarine sediments.	Profusion (>100!!) of epithermal Au-Ag deposits (Lawyers, Chapelle, Al), syngenetic with volcanism. No VMS.	Several moderate multi-element anomalies; numerous single-element anomalies - base-metals to NE, precious-metals throughout.	Diakow et al., 1991 Diakow et al., 1993	?becoming submarine to NE (poorly mapped in that area).
C3	Harrison Lake	ImJHL Harrison Lake Fm - calc-alkaline, mafic - felsic, early volcanics are shallow water to subaerial, later subaqueous with local subaerial to shallow water. KG Fire Lake Group (<i>Brokenback Hill Fm</i>) - mafic to intermediate pyroclastics & flows, slates, wackes, rare felsics. Lower units submarine, Upper unit subaerial.	Weaver Creek member of JHL hosts Kuroko VMS and basemetal veins. Seneca and Fleetwood are precious metal-rich. No epithermal mineralization. Epigenetic Au-Ag veins & disseminated deposits probably Tertiary in age (related to Oligocene intrusions)	1 highly anomalous sample, 2 moderate. 1 moderate multi-element anomaly; a few precious metal anomalies.	Mahoney et al., 1995 Sherlock et al., 1996 Lynch 1992	Felsics at top of Weaver Creek mbr - submarine!, shallow water portion is mafic.
C4	Slocan	uTr Slocan Group: argillite, quartzitic argillite, limestone, minor tuff. Submarine (deep water). Massive intermediate to felsic grey tuff (uTrS) and greenstone (?IJR) in Nakusp area	One massive sulphide deposit (Kusp) ?Kuroko-type. Epigenetic precious metal veins of the Slocan Camp are Eocene in age.	Strong to moderate multi-element anomalies in the Slocan Camp area; many moderate anomalies elsewhere in the belt. No Hg data for western part of area (82L)	Hedley, 1952 Little, 1960 Beaudoin et al, 1992 Hyndman, 1968	Mostly sediments - volcanics in Nakusp area though no felsics. Mineralization later
C5	Rossland	IJR Rossland Gp: (<i>Elise Fm</i>): dominantly mafic flows and pyroclastics, local sediments and rare felsic flows. K-rich calc-alkaline to alkaline. Deep to shallow submarine becoming subaerial in upper units.	Only one possible Kuroko-type VMS deposit (Perrier - Lucky Boy Adit). Polymetallic veins of several generations, many bearing tetrahedrite, arsenopyrite or stibnite. However, all are Middle Jurassic, post-Elise Fm.	A few moderate multi-element anomalies; single element precious or base-metal anomalies. Related to known polymetallic vein mineralization.	Höy & Dunne, 1997 Fyles, 1984 Höy & Andrews, 1991	Rare felsics, Ag mineralization is later. Some debate regarding presence of VMS deposits.
C6	Quatsino-Kyuquot	ImJB Bonanza Group: siliceous siltstone, argillite, sandstone, limestone, debris flows, mafic-intermediate subaqueous tuff, breccia and flows; subaerial, mafic - felsic, calcalkaline flows and pyroclastics, minor volcanic conglomerate and sandstone.	Acid-sulphate transitional to epithermal mineralization hosted in subaerial rhyolites (Expo zone, LeMare Lake). No massive sulphides.	Scattered moderate to highly anomalous multi-element anomalies; ?spatially related to faults and mesothermal Au-carbonate mineralization; moderate anomalies in north reflect transitional mineralization.	Nixon et al., 1993 Nixon et al., 1994 Nixon et al., 1995 Panteleyev & Koyanagi, 1993	Submarine volcanics are dominantly mafic; felsics only in upper subaerial sequence.
C7	Nitinat-Cowichan	ImJB Bonanza Group: subaqueous maroon tuffs, tuffaceous sandstone, conglomerate, argillite (<i>Redbed Creek facies</i>); subaerial, calcalkaline, plagiophyric mafic to intermediate flows, lapilli and crystal tuffs, felsic lapilli tuffs and welded tuffs (<i>Klanawa facies</i>).	Massive sulphides (Jasper) and epithermal deposits rare; mesothermal Au-carbonate veins are Tertiary.	Moderate multi-element and anomalous gold samples scattered throughout the area; ?related to mesothermal veins and older quartz-gold veins.	Massey, 1995 Yorath et al., 1999	Volcanics in submarine section are predominantly mafic to intermediate, felsics are subaerial.