SURFICIAL GEOLOGY AND DRIFT EXPLORATION STUDIES IN THE TSACHA LAKE AND CHEDAKUZ CREEK AREAS (93F/2, 7), CENTRAL BRITISH COLUMBIA

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KEYWORDS: Surficial geology, drift prospecting potential, till, diamicton, glaciofluvial outwash, glaciolacustrine sediments, applied geochemistry, mineral dispersal, dispersal trains

INTRODUCTION

Quaternary geological investigations were undertaken in NTS areas 93F/2 (Tsacha Lake) and 93F/7 (Chedakuz Creek; Figure 1) in the Interior Plateau, funded in part by the Canada/British Columbia Mineral Development Agreement (1991-1995). The Interior Plateau project has three other components: bedrock geology, lake sediment geochemistry and mineral deposit studies (see Diakow *et al.*, Cook and Luscombe, and Lane and Schroeter, respectively, 1995, this volume). Previous surficial geology studies as part of this program include mapping and till geochemistry studies in 93F/3 (Fawnie Creek) in 1993 (Giles and Levson, 1994a,b; Levson and Giles, 1994; Levson *et al.*, 1994), 93C/1 and 8 (Chilanko Forks and Chezacut, respectively; Giles and Kerr, 1993, Kerr and Giles, 1993a,b) and 93C/9 and 16 (Clusko River and Toil Mountain, respectively; Proudfoot, 1993, Proudfoot and Allison, 1993a,b) in 1992.

A thick mantle of drift and widespread Neogene lava flows has hindered mineral exploration on the Interior Plateau. The geological, geochemical and geophysical databases in the region were until recently lacking in detail; the combined efforts of the Geological Survey of Canada and the British Columbia Geological Survey Branch, under the auspices of the MDA, have provided much new information. The lack of mineral exploration in this area is a measure of the difficulties involved and a perception of better chances elsewhere. Now, as the inventory of easily explorable lands decreases, new exploration methods are being developed in areas previously avoided.

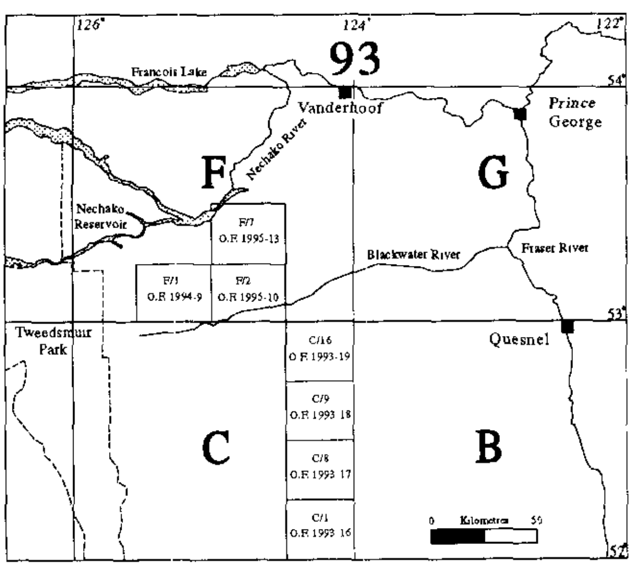

Figure 1: Location map of Tsacha Lake (93F/2) and Chedakuz Creek (93F/7) map sheets. The 1993 study area, 93F/3, and the 1992 study areas 93C/1, 8, 9, 16 are also shown.

Surficial geological mapping was completed on 93F/2 and 7 in order to understand the glacial history and aid in interpreting till geochemical data. Detailed case study work was conducted near known mineral prospects to help define models of glacial dispersal and evaluate the effects of surficial processes on geochemical distribution patterns (O'Brien *et al.*, 1995 this volume).

This years objectives are to:

- Compile 1:50 000 surficial geology maps of the Tsacha Lake (93F/2) and Chedakuz Creek (93F/7) areas, conduct stratigraphic and sedimentologic studies of Quaternary deposits in the area, and define the glacial history and ice-flow patterns.
- Complete a regional (1:50 000) till sampling program for 93F/2 and F/7 and produce a series of till geochemistry maps and reports for mineral exploration purposes.
- Develop and refine methods of drift exploration applicable to the Interior Plateau region by conducting detailed case studies around known mineral prospects.

STUDY AREA

The study area lies on the Nechako Plateau, in the west-central part of the Interior Plateau (Holland, 1975). The Fawnie Range trends south-southeast on the southwest side of the area and the Nechako Range parallels this on the northeast side (Figure 2). The highest peaks are Mount Davidson at an elevation of 1861 metres (6107 feet) in the Fawnie Range and Kuyakuz Mountain at 1781 metres (5842 feet) in the Nechako Range. The Fraser Plateau reaches as far north as the Blackwater River across the southern portion of the area. The Chedakuz valley extends through the centre of the area, from the Blackwater River northwest to the Nechako Reservoir and is flanked on either side by the Fawnie and Nechako ranges. Chedakuz Creek flows south from the east side of Kuyakuz Mountain,

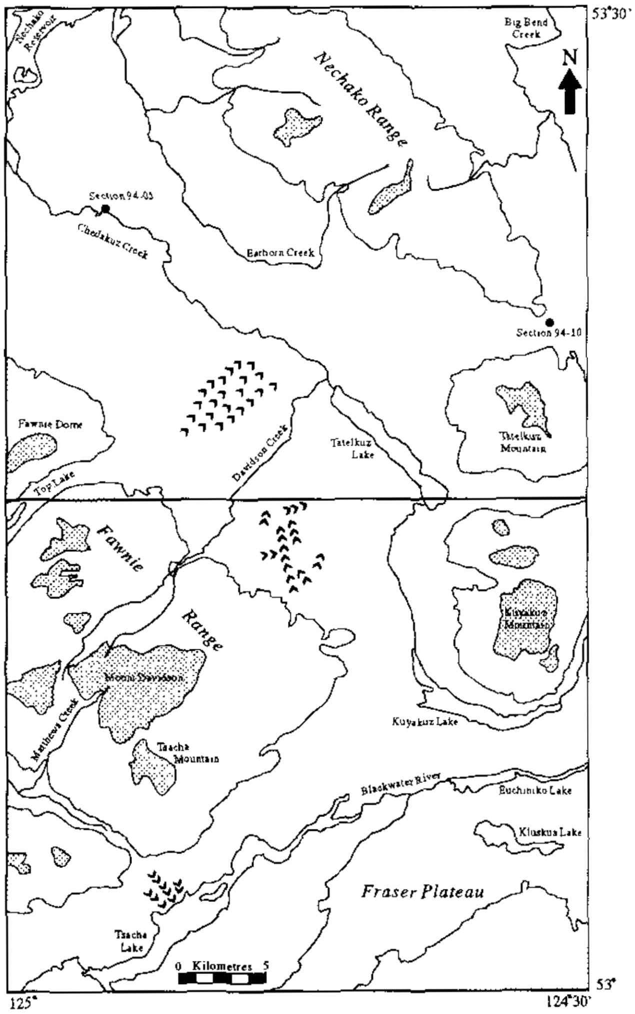

Figure 2: General physiography of the Tsacha Lake-Chedakuz Creek area. Light shading represents areas with elevations above 1220 metres (4000 feet) and darker shading areas in excess of 1520 metres (5000 feet). Major esker complexes and locations of sections noted in the text are also shown.

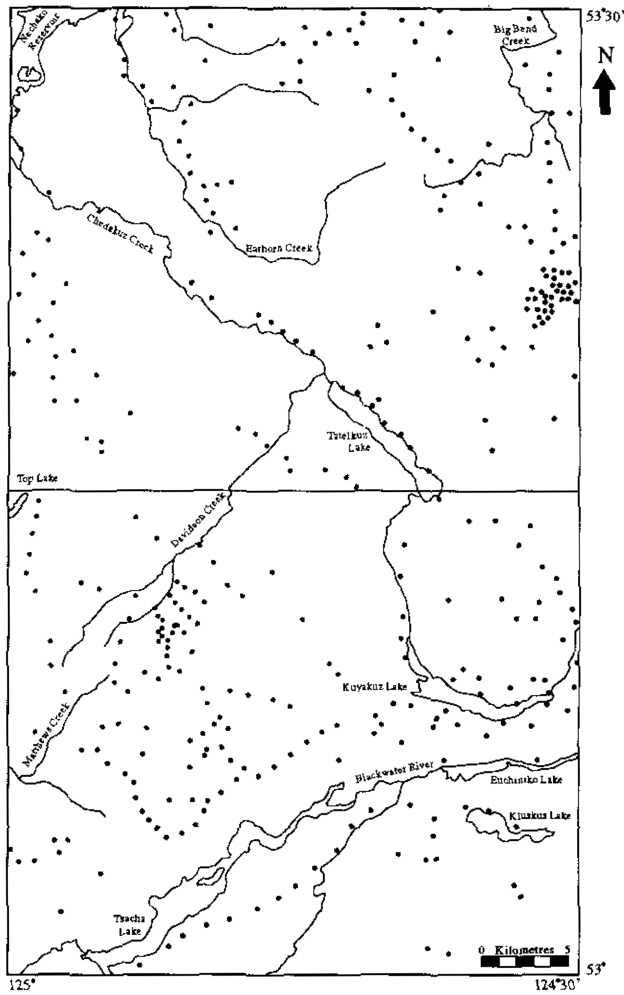

Figure 3: Location map of sample sites in the study area.

north through Kuyakuz Lake to Tatelkuz Lake and then northwest until it finally empties into the Nechako Reservoir. The Fraser Plateau and the southern flanks of the Fawnie Range drain into the Blackwater River which flows east into the Fraser River. The lowest elevation in the area is on the Nechako Reservoir, around 915 metres (3000 feet). Valleys in the area are broad with gently sloping sides reflecting glacial modification. During Late Wisconsinan glaciation, ice moved into the area from the Coast Mountains before flowing further north, northeast and east onto the Interior Plateau (Tipper, 1963,1971).

The study area is approximately 100 kilometres southwest of Vanderhoof and is accessed by the Kluskus-Ootsa forest service road. Logging road access is good for most of 93F/7 but much of 93F/2 is unlogged and accessible only on foot.

METHODS

Surficial geology mapping was completed by preliminary interpretation of air photographs (suites BC87050, BC88074 and BC88075), field checking and stratigraphic and sedimentologic investigations of Quaternary exposures in the study area. Ice-flow history was largely deciphered from the measurement of the orientation of crag-and-tail features, flutings, drumlins and striae.

Basal till samples (each 3-5 kg in weight) were collected for geochemical analysis in order to detect buried mineralization. Sampling was conducted mainly in truck accessible areas near logging roads and forest clear-cuts. Trail bikes, boats and helicopters were also used where feasible. Numerous foot traverses were completed in otherwise inaccessible regions. Sample locations were selected to obtain complete coverage of the map area, with the greatest density of samples along transects perpendicular to the established ice-flow direction (Figure 3). Where roads parallel the former ice flow direction, wide-spaced sampling was used, as closely spaced samples would repeatedly represent the same terrain directly up-ice and therefore duplicate each other. An intermediate sample spacing was used on transects oblique to flow.

Samples were collected from the C mineral soil horizon, which is comparatively unaffected by the pedogenic processes operative in the A and B-horizons (Agriculture Canada Expert Committee on Soil Survey, 1987; Gleeson *et al.*, 1989). Sample sites consist of natural and man-made exposures (roadcuts, streamcuts, lake shores, borrow pits, soil pits and trenches). Sample depths in soil pits vary from 50 to 150 centimetres, averaging about 1 metre and are almost always greater in roadcuts (up to 8 m). Locations of sample sites were plotted on a 1:50 000 topographic base map with the aid of air photographs. A total of 195 till samples were collected in 93F/2 and 206 in 93F/7, for a total of 401 samples throughout the study area (Figure 3). A density of approximately one sample per 5 square kilometres was achieved. Higher density sampling was conducted in areas of perceived higher mineral potential and around known mineral prospects to provide a clearer understanding of glacial dispersal processes. At each sample site, data collected included descriptions of sediment type, primary and secondary structures, matrix texture, presence of fissility or jointing, compactness, topographic position, slope and aspect, and sediment genesis and thickness. Further information was noted on surrounding vegetation, soil horizons, oxidation, bedrock striae and bedrock lithology.

Till samples were dried, split and sieved to -230 mesh (<62.5 µm). This fraction was analysed by instrumental neutron activation analysis (INA) and inductively coupled plasma analysis - atomic emission spectroscopy (ICP-AES) for a total of 47 elements. The -230 mesh fraction is frequently dominated by phyllosilicates which are generally enriched in metallic elements (Shilts, 1993) and for this reason is the preferred fraction to analyse. Half of each sample split was reserved for grain size or other follow-up analyses.

Detailed till and soil geochemical sampling was conducted at three mineral prospects: CH (MINFILE 93F 04), Uduk Lake (MINFILE 93F 057) and Pem (Blackwater-Davidson, MINFILE 93F 037, O'Brien *et al.* 1995, this volume). Follow-up studies based on results from the Fawnie Creek survey of 1993 (Levson *et al.* 1994) were also completed to document mineral dispersal processes. These include surveys on the Wolf (MINFILE 93F 045), Malaput (MINFILE 93F 056) and Buck (MINFILE 93F 050) prospects and the Van Tine and Cigar anomalies. Two further investigations were completed north of the Nechako Reservoir: on the Yellow Moose property (MINFILE 93F 058) and on the Stubb property. Eighty-five samples were collected along linear or fan-shaped traverses to document glacial dispersal and transport distance at these sites.

SAMPLE MEDIA

Sampling was restricted to basal tills rather than other types of surficial materials for several reasons (Giles and Levson, 1994a):

- Basal tills are deposited directly down-ice from their source and therefore mineralized materials dispersed within these tills can be more readily traced to their origin than can anomalies in other sediments. Processes of dispersal in ablation tills, glaciofluvial, and glaciolacustrine sediments are more complex and they are typically more distally derived than basal tills.
- Dominance of one regional ice-flow direction throughout much of the last glacial period has resulted in simple linear, down-ice transport of material. This makes tracing of basal till anomalies to source relatively easy compared to areas with more complex ice-flow histories.
- Due to the potential for development of large dispersal trains, mineral anomalies in basal tills may be readily detected in regional surveys.

ANALYSIS OF CLASTS IN TILLS

A new field procedure introduced this season included an evaluation of clasts in the till at each sample site. The objectives were to look for mineralized clasts, decipher patterns of glacial dispersal, determine the distances of glacial transport and rates of clast abrasion and rounding, and relate till-clast lithology to the bedrock lithology to aid in bedrock mapping. The procedure involved field identification of lithology, angularity and abrasion characteristics of each of five categories of clasts: 1) pebble-sized clasts of local origin in the basal tills (*e.g.* angular clasts lacking evidence of glacial transport; 2) cobble to boulder sized surface erratics of presumed supraglacial distal origin (*e.g.* rocks of Coast Mountain origin); 3) cobble to boulder-sized clasts showing abundant evidence of glacial abrasion (*e.g.* heavily striated and faceted Chilcotin basalts); 4) clasts of any size or shape showing evidence of potential mineralization (*e.g.* sulphides, heavy iron oxidation, drusy quartz); and 5) other rock types. A visual survey of a wide area around the sample sites was conducted to locate rocks of category 4, the main focus of the sampling program; these clasts were described and collected for assay. These data will be useful for tracing mineralized float to its source and to help determine bedrock lithology where exposure is limited due to drift cover.

SURFICIAL GEOLOGY

Different types of surficial sediments have distinctly different provenances based on their transportation and depositional histories. Six genetic categories of surficial sediment were defined and mapped in the study region: morainal, glaciofluvial, glaciolacustrine, fluvial, colluvial and organic sediments. Subdivisions within these categories were noted and mapped accordingly.

MORAINAL SEDIMENTS

Surficial geology mapping in the area shows that morainal sediments are the most widespread Quaternary deposits. They form a cover of variable thickness across much of the area and may occur as hummocky, kettled, fluted or relatively flat topography. In the Chedakuz valley, till thickness varies from a few to several metres in low-lying area to less than 2 metres in upland regions and along steep slopes. Morainal sediments are commonly overlain by glaciofluvial outwash or a glaciolacustrine veneer at lower elevations.

Two distinct facies of morainal sediments are recognized: a compact, fissile, matrix-supported, sandy silt diamicton and a loose, massive to stratified, sandy diamicton. The first is interpreted to be basal lodgement and/or melt-out till and the latter to be glacigenic debris-flows and resedimented deposits. Basal tills seldom occur at the surface, usually being overlain by glacigenic debris-flow deposits and, on slopes, by resedimented diamictons of colluvial origin.

Basal tills are moderately to well compacted but range from weakly consolidated to very compact or overconsolidated. Moderate to strong platy fissility exists in the majority of samples, although they are occasionally weakly fissile or nonfissile. Weak to very strong oxidation, characterized by red-brown staining, is common and can occur pervasively or along vertical joint planes and horizontal partings. Subhorizontal slickensided surfaces are sometimes present, especially in clay-rich till. Clasts in the basal tills range in size from small pebbles to large boulders with medium to large pebbles dominating most exposures. As much as 50% of the till may be comprised of clasts, but most exposures have between 10 and 30%. Striated, faceted and embedded clasts are common and typically up to about 20% of the clasts are striated. Striated clasts are commonly flat lying and bullet shaped, and may be aligned parallel to ice-flow. Crude bedding, locally visible in the diamicton, is indicated by higher percentages of small pebbles in some beds. Lower contacts of basal till units vary from sharp and planar to gradational and irregular. Where till overlies competent bedrock that was abraded slowly by sediment-rich basal ice, there is a clear and sharp contact.

Glacigenic debris-flow deposits are loose to weakly compacted and are either massive or interbedded with stratified silt, sand or gravel. Clasts vary in size from small pebbles to large boulders but are usually medium to large pebbles. These diamictons typically contain 20 to 50% clasts although up to 70% are present locally. Subangular to subrounded clasts are most common, but local angular clasts may also occur. Typically up to 10% of the clasts are striated. Lenses and beds of sorted silt, sand and gravel occur in many exposures and may be continuous for up to 5 metres, although they are most frequently 10 to 100 centimetres wide. Debris-flow deposits may exhibit weak to very strong, preferential oxidation along the more permeable sand and gravel beds. Debris-flow units have gradational to clear lower contacts and typically overlie basal till or occur within glaciolacustrine or glaciofluvial sequences, such as in the Chedakuz valley, at elevations below 1040 metres (3400 feet). At one exposure along Chedakuz Creek (Figure 2, section 94-05) a silty-sand diamicton, 2 to 3 metres thick, with a broad, trough-shaped, erosive lower contact, overlies ripple-bedded, fine sands. This diamicton is loosely to moderately consolidated, matrix supported and contains up to 40% subangular to subrounded clasts. A thin bed of gravel overlies the diamicton and fills in an incised channel, 2 metres deep by 5 metres wide. Low consolidation, sandy matrix texture, stratigraphic associations and channelized form of the diamicton suggest that it is a glacigenic debris-flow deposit. Similarly, on the east side of the Chedakuz valley north of Tatelkuz Lake (Figure 2, section 94-10), a unit of horizontally bedded sand is erosionally overlain by a poorly exposed bed of massive, matrix-supported, sandy diamicton, 0.5 to 1.5 metres thick. This diamicton contains up to 30% subangular to subrounded clasts, is moderately compact and contains lenses of coarse sand. A second sand bed, 3 to 5 metres thick, overlies the diamicton and the section is capped by a pebble-cobble gravel. The presence of sand lenses within the diamicton, sand beds above and below it, and its moderately compact nature suggest a glacigenic debris-flow origin.

GLACIOFLUVIAL SEDIMENTS

Glaciofluvial sediments are common in valley bottoms and along valley flanks, occurring as eskers, kames, terraces, outwash fans and plains. They consist mainly of poorly to well sorted, stratified, pebble and cobble gravel and sand in deposits up to 10 metres thick. Clasts are mainly rounded to well rounded and vary in size from small pebbles to cobbles with rare boulders. Structureless or crudely bedded, small-pebble to cobble, sandy gravel beds are common. Frequently these deposits are interbedded with glacigenic diamictons indicating that they are proximal outwash deposits. Hummocky topography, consisting of ridges or hills of sand and gravel with large intervening depressions (kettle holes), is commonly associated with these deposits and indicates the presence of ice blocks.

On the eastern flank of Mount Davidson, meltwater channels, deeply incised into the morainal blanket, extend northward into eskers formed under stagnant ice masses in the Chedakuz valley (Figure 2). A large esker complex also occurs on the western margin of Chedakuz valley where Top Lake valley cuts through the Fawnie Range. The eskers fan out into the Chedakuz valley, indicating that they were formed subglacially by waters flowing out of the Top Lake valley. As the glacier retreated up Top Lake valley, stagnant ice remained in the Chedakuz valley and impounded drainage in the Top Lake region (Giles and Levson 1994a).

GLACIOLACUSTRINE SEDIMENTS

Glaciolacustrine sediments are found throughout the Chedakuz valley up to an elevation of approximately 1070 metres (3500 feet). Glaciolacustrine sediments were also found in the Top Lake valley. They include horizontally to wavy bedded, fine to coarse sand and horizontally laminated fine sands, silts and clays.

At section 94-05 (Figure 2), 6 metres of sand occurs beneath a 1 to 3 metre thick diamicton. Up to 2 metres of subhorizontally laminated clayey silt, with numerous sand and pebble lenses as well as rip-up clasts, overlies the diamicton. The basal unit is interpreted to be advance phase fluvial and proximal lacustrine sand deposited as glaciers moved into the valley. The diamicton is inferred to be a glacigenic debris-flow deposit. The deposits capping the section are interpreted as glaciolacustrine sediments deposited in quiet water with interbedded glaciofluvial deposits. The sequence of deposits at this section and others in the region indicates ice damming in Chedakuz valley during both advance and retreat stages of the last glaciation.

POSTGLACIAL FLUVIAL AND ORGANIC SEDIMENTS

Fluvial sediments occur in valley bottoms throughout the area, especially in the Chedakuz, Blackwater and Top Lake valleys. Most modern creeks and rivers in the area are meandering streams with gravel channels. Floodplains are dominated by fine sands, silts and organics. In upland areas small gravelly creeks have reworked glacial, glaciofluvial and colluvial sediments and locally are incised into bedrock. The flat, open terrain of Chedakuz valley and the Fraser Plateau (Figure 2) is characterized by marshes and shallow lakes filled with organic sediment. The organic deposits consist of decayed marsh vegetation with minor sand, silt and clay. Organic deposits also occur in low areas in valley bottoms.

POSTGLACIAL COLLUVIAL SEDIMENTS

A thin veneer of weathered and broken bedrock clasts in a loose sandy matrix occurs on steep slopes throughout the area. These deposits grade downhill into a thicker cover of colluvial diamicton derived from both local bedrock and till. Colluvial veneers are commonly found over tills on slopes. Colluvial diamictons are differentiated from till by their loose, unconsolidated character, dominance of coarse, angular clasts of local bedrock, crude stratification and lenses of sorted sand and gravel.

ICE-FLOW HISTORY

Results of ice-flow studies in the area indicate that there was one dominant flow direction towards the east-northeast. Striation measurements from exposed bedrock sites typically indicate northeast to east flow, varying from 055° to 080°. Topographic control of ice flow during early glacial phases is indicated by valley-parallel striae on bedrock surfaces that are buried by thick till sequences. A more complex local ice-flow history is indicated by highly variable striae trends at one site east of Kuyakuz Lake. At the Late Wisconsinan glacial maximum, ice covered the highest peaks in the region and movement appears to have been unaffected by topography, suggesting the elevation of the ice surface to be in excess of 1750 metres. This is supported by northwest trending striae and flutings on top of Tsacha Mountain (Figure 2; elevation 1734 metres). Crag-and-tail features, drumlins and glacial flutings are present throughout the area and indicate flow towards the east and northeast during full glacial time.

SUMMARY OF GLACIAL HISTORY

The first lobes of Late Wisconsinan Fraser glaciation ice advancing from the southwest were probably confined to the major valleys of the Nechako Reservoir and Blackwater River. Ice in the former probably led to damming of the Chedakuz drainage and development of a large proglacial lake there. At the margins of the advancing ice, coarse-grained proglacial outwash was deposited locally in the valley bottoms. Massive, matrix-supported, compact lodgement and melt-out tills were subsequently deposited by the advancing ice. Drumlins, crag-and-tails, flutings and striations all indicate that when the glaciers were thick enough to be relatively unaffected by topography during full-glacial times, ice flow was east-northeasterly (Giles and Levson, 1995: Weary *et al.*, 1995). During deglaciation, loose, sandy gravelly diamictons were deposited on top of the tills by debris flows.

Top Lake valley was the main outlet through the Fawnie Range for meltwaters from ablating ice to the west. Stagnant ice masses in the Chedakuz valley dammed water and created a glacial lake in the Top Lake area (Giles and Levson, 1994a; Levson and Giles, 1994). A large esker complex is located at the eastern end of Top Lake valley where meltwaters flowed under stagnant ice masses into Chedakuz valley. Confined subglacial flow also created eskers on the eastern flank of Mount Davidson and on the northwest shore of Tsacha Lake. Deeply incised meltwater channels are also common in Tsacha Lake and Blackwater River areas. Gravelly outwash plains formed in main valley bottoms as water and sediment were transported away from glacial ice.

During deglaciation a large glacial lake formed in the Chedakuz valley. Lake waters deposited sediment as high up as 1070 metres (3500 feet) on the valley sides, approximately 160 metres (500 feet) above the present valley floor. This lake was probably confined to the Chedakuz valley by an ice mass to the north in the Nechako Reservoir valley and by stagnant ice and higher land to the south in the Chedakuz valley. Glacigenic debris-flow deposits and kettled topography in the valley and on the margins indicate that the lake was in contact with stagnant ice. Melting ice on the Fraser Plateau appears to have had free drainage eastward along the Blackwater River, away from the study area.

DRIFT PROSPECTING POTENTIAL

The ease with which a surficial sediment can be traced back to its original bedrock source using common methods of sampling near-surface sediments is referred

TABLE 1. DRIFT PROSPECTING POTENTIAL MATRIX IN THE STUDY AREA

Map symbol	Dominant surficial materials	Transport distance	Derivative phase	Traceability to bedrock source	Dispersal pattern	Applicable survey scale and type
VERY HIGH POTENTIAL						
R	bedrock	N/A	source	N/A	N/A	N/A
C	colluvial diamicton and rubbly talus deposits	< 100 m to 1 km	first	very good	downslope, linear to fan shaped	1:5000 (property-scale) S, C
HIGH POTENTIAL						
Mv	morainal diamicton, mostly basal tills < 1 m thick	< 2 km	first	good	down-ice, linear dispersal train	1:5000 to 1:50 000 S, C, T, HM
Mb	morainal diamicton, mostly basal tills > 1 m thick	< 5 km	first	good to moderate	down-ice, linear dispersal train, narrow, elongated	1:5000 to 1:100 000 S, C, T, HM
MODERATE POTENTIAL						
M : FG	sandy diamicton, often mantled by < 1 m of glaciofluvial deposits	> 1 km	second	moderate to poor	broad, down-ice, elongated fan	1:10 000 to 1:100 000 S, C, T, HM
LOW POTENTIAL						
F + FG	fluvial and glaciofluvial gravels and sands, > 1 m thick	> 5 km	second or third	generally poor	broad, down flow, fans, discontinuous	1:50 000 to 1:250 000 (regional scale) C, HM
VERY LOW POTENTIAL						
O	organics	> 5 km	third or fourth	generally poor	irregular, discontinuous	1:100 000 to 1:250 000 (regional scale); N
L + LG	lacustrine and glaciolacustrine sand, silt and clay	> 5 km	third or fourth	generally poor	irregular, discontinuous	1:100 000 to 1:250 000 (regional scale); N

to as drift prospecting 'potential'. It refers only to the relative usefulness of different surficial sediments for geochemical, lithological and heavy mineral sampling programs, particularly those conducted at property scales (~1:5000), and does not apply to other types of surveys including geophysical surveys, biogeochemistry, lake and stream sediment geochemistry and vapour geochemistry which are not strongly influenced by the nature of the surficial sediments at the sample site.

Drift prospecting potential categories are derived from surficial geology data. Five categories of potential are outlined in Table 1, with different surficial sediments being ranked by genesis, sediment thickness, transport distance, number of erosional and depositional phases (derivatives) and traceability to bedrock source. The probable dispersal pattern of mineralization and the applicable type and scale of survey to locate such mineralization are also indicated on Table 1. Transport distance is the expected distance of sediment travel, measured from the bedrock source to the place of deposition. One cycle of erosion, transport and deposition of bedrock material to form a sedimentary deposit is considered to be one derivative phase. If the sediment is then re-eroded, transported and redeposited then the sediment is a second derivative. Basal till, formed of comminuted bedrock material, transported and deposited directly by ice by lodgement or melt-out processes is a first derivative of bedrock. Glaciofluvial sediments, derived from till or from material within the ice, have undergone two episodes of transport and are viewed as second derivatives of bedrock. Resedimented glacial deposits, consisting of a mix glacigenic debris-flow deposits and minor glaciofluvial sediments, are for this work, considered to be second derivatives. Traceability to bedrock source is a reflection of the probable transport distance, the number of derivative phases, and the size, shape and continuity of the dispersal plumes.

CONCLUSIONS

To reflect mechanical dispersal processes, samples should be collected from within the C mineral soil horizon. Sedimentologic data should be collected at all sample sites in order to distinguish till from glacigenic debris-flow, colluvial, glaciofluvial or glaciolacustrine sediments. These sediments have different processes of transportation and deposition which must be recognized in order to understand associated mineral anomaly patterns. For example, local variations will be reflected in some sediments while regional trends may be evident in others. Analysis of these sediments will be useful only if their origin is understood.

A basic understanding of ice-flow direction, glacial dispersal patterns, and transportation distances is also required for successful drift exploration programs. Interpretation of data with respect to glaciation may provide the explorationist with new avenues to explore for bedrock sources of mineralized float or geochemically anomalous soil samples.

Till geochemical sampling combined with surficial geology mapping has proven to be a useful method for detecting mineralization elsewhere in the Interior Plateau region. This was demonstrated by the detection of all documented mineral occurrences in the 1993 map area (Levson *et al.*, 1994), including several sites not identified in the literature before the sampling program was conducted. In addition, several new multi-element till geochemical anomalies, with values comparable to those down-ice of advanced prospects in the area, were discovered. These data strongly suggest that geochemical surveys, using basal tills as a sampling medium, are an effective tool for regional exploration in the Interior Plateau region.

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