BRITISH COLUMBIA

PROSPECTORS ASSISTANCE PROGRAM

MINISTRY OF ENERGY AND MINES

GEOLOGICAL SURVEY BRANCH

PROGRAM YEAR:	1997/1998
REPORT #:	PAP 97-34
NAME:	JACK KRUSCHE

BRITISH COLUMBIA PROSPECTORS ASSISTANCE PROGRAM
PROSPECTING REPORT FORM

Ministry of Employment
and Investment
Kamloops, B.C.
Rec'd FEB 11 1998

JACK B. KRUSCHE, P.ENG.,

REFERENCE NUMBER 87

January 29, 1998

Geological Survey Branch
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JAN 30 1998

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BRITISH COLUMBIA PROSPECTORS ASSISTANCE PROGRAM
PROSPECTING REPORT FORM

JACK B. KRUSCHE, P.ENG., REFERENCE NUMBER 87

DAYS

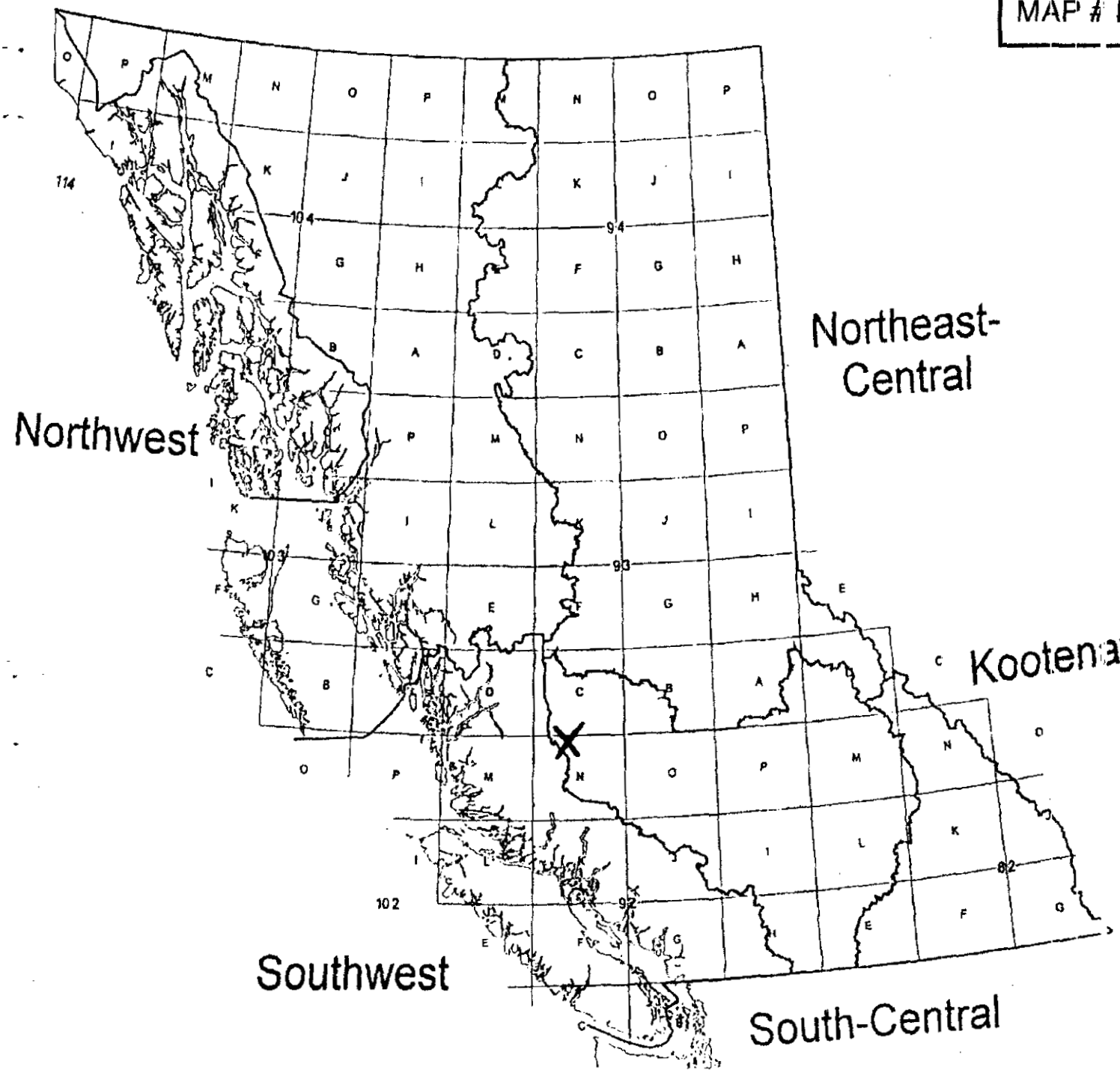
PROJECT AREA	PROJECT COMPLETED	PROSPECTING DAYS	OTHER DAYS	TOTAL DAYS
Kleena Kleene	Yes	54	30	84

Prospecting Assistants:

Agnieszka Bak, B.A.; Geological field assistant, yearly since 1990; worked in: South Central and Mid Coast B.C., Northern Alberta.

CLAIMS STAKED DURING/AFTER PROSPECTING ACTIVITY = NONE
OPTION AGREEMENTS = NONE

MAP # 1



" X " *indicates the general location of* the Kleena Kleene Prospect Area

September - October 1997
Jack Krusche, P.Eng.

BRITISH COLUMBIA PROSPECTORS ASSISTANCE PROGRAM
PROSPECTING REPORT FORM (continued)

JACK B. KRUSCHE, P.ENG. REFERENCE NUMBER 87

LOCATION/COMMODITIES

Project Area MINFILE No. = NONE

Location of Project Area NTS 92N; 14 & 15W Lat. 125°10'E Long. 51°57'N

Description of Location and Access

The Kleena Kleene area is approximately 10 - 20 Km. west-southwest of the Kleena Kleene Post Office. The Kleena Kleene Post Office is approximately 300 Km. West of Williams Lake, on Highway #20 - the Bella Coola Highway. (See Map I/II.)

One approach, from the north east, is about sixteen kilometers on a very rough, very old logging trail from Highway #20. At that point, one must cross the Klina Klini River - which is extremely dangerous due to waterfalls and rapids. The prospect area may then be reached on foot - 'cross country' through approximately 5 - 15 km. of thick bush, with windfall and muskegs. Alternatively, one can access the area from the east from the Miner Lake logging road, about 10 km. from highway #20, but then a similar trek is involved, from 10 to 16 km., crossing steep cliffs, canyons and bush (but at least no river.)

Main commodities Searched For

Gold, Silver vein deposits, Copper. Looking for alteration of country rock and gossans.

Known Mineral Occurrences in Project Area

Approximately 12 km to the southeast of the Kleena Kleene area is an operating gold mine that has been worked since the 1920's on the north slope of Perkins Peak. (The mine is known by various names: the Apex Claims, Pin Claims, and Mountain Boss - believed to be owned by Kleena Kleene Gold Mines of Vancouver). At present, the mine is in the development stage.

Approximately 16 km to the northwest, is another group of claims; the Pine Woods Property, believed to be optioned by Bond Gold Canada.

The Kleena Kleene area is on trend with some of the more famous gold mines and gold discoveries in B.C.. For example to the south are Bralorne/Goldbridge, to the north are Iskut/Sulphurets and Taku; numerous smaller gold properties also extend along this trend.

It was stated by B.P. McLaren in 1990 that the general area including Kleena Kleene is considered to be of high mineral potential, undeveloped only because of the lack of exploration. Low exposure to exploration has been due to poor accessibility, rugged terrain, and poor documentation.[1] This situation still exists today - although logging is opening up much new country.

The Kleena Kleene area is cut by at least two faults-subsidiaries to the Klinaklini Normal fault zone. According to H.W. Tipper, this is a most favourable structural configuration for mineral occurrences in the general region.[2]

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[1] A MINERAL RESOURCE ASSESSMENT OF THE CHILKO LAKE PLANNING AREA; by G.P. McLaren, page 90; Bulletin 81; March 1990.

[2] G.S.C., Paper 68-33, page 87; H.W.Tipper; the Geological Survey of Canada. (The map of 1967, and report of 1969).

WORK PERFORMED

1. The primary work performed was conventional prospecting, covering an approximate area of 400 Km.^{2}, (with some Geological Mapping). Over 100 samples were collected; rock, stream sediment, and 1 moss sample. 14 samples were sent for analysis to Chemex Labs, Vancouver. 32 element ICP and gold assays were to be done. It was hoped that 3 - 5 samples would be given for thin section analysis, however due to time constraints this was not done before the production of this report. Also, a geological map was to be made of the explored area. If the Ministry states an interest in these further results, then they can be forwarded to the Ministry upon their completion.

SIGNIFICANT RESULTS

The project goal was to find and explore the contact of the Coast Plutonic Complex with the Interior Plateau. The 'Contact' was found in many places along the boundary, although at times extreme bushwacking skills were required. Samples from both sides of the contact were taken.

Encouraging signs of alteration and silicification of the country rock exist in most Contact locations. However only minor gossans, and very minor, visible sulphides were observed. Assays of those samples, selected to date, gave negative results. In many places, overburden, bush cover, and water or muskeg, prevented sampling and observation of the contact.

Why no soils? Stream sed's?

Best assay/sample type

The most interesting outcrops were those found in the Contact zones; showing signs of alteration, silicification, also the dull gray quartz veins, and areas with local, rusty, weathering characteristics. Composite rock samples and stream sediment samples were sent for analysis (gold and ICP.) The assay results (together with the field data), will indicate which individual samples (if any), warrant further testing. Areas of intense mineralization were not found, and it is doubtful that there are any deposits of mineable quantity, in the areas visited. However, the outcrops studied, verify that the area is of interest, and further exploration should be continued along the Contact zone These areas are inaccessible, except by foot, and that only with difficulty.

Please refer to Sample Descriptions. Comments: ANALYZE or THIN SECTION; were noted if a sample is of particular interest.

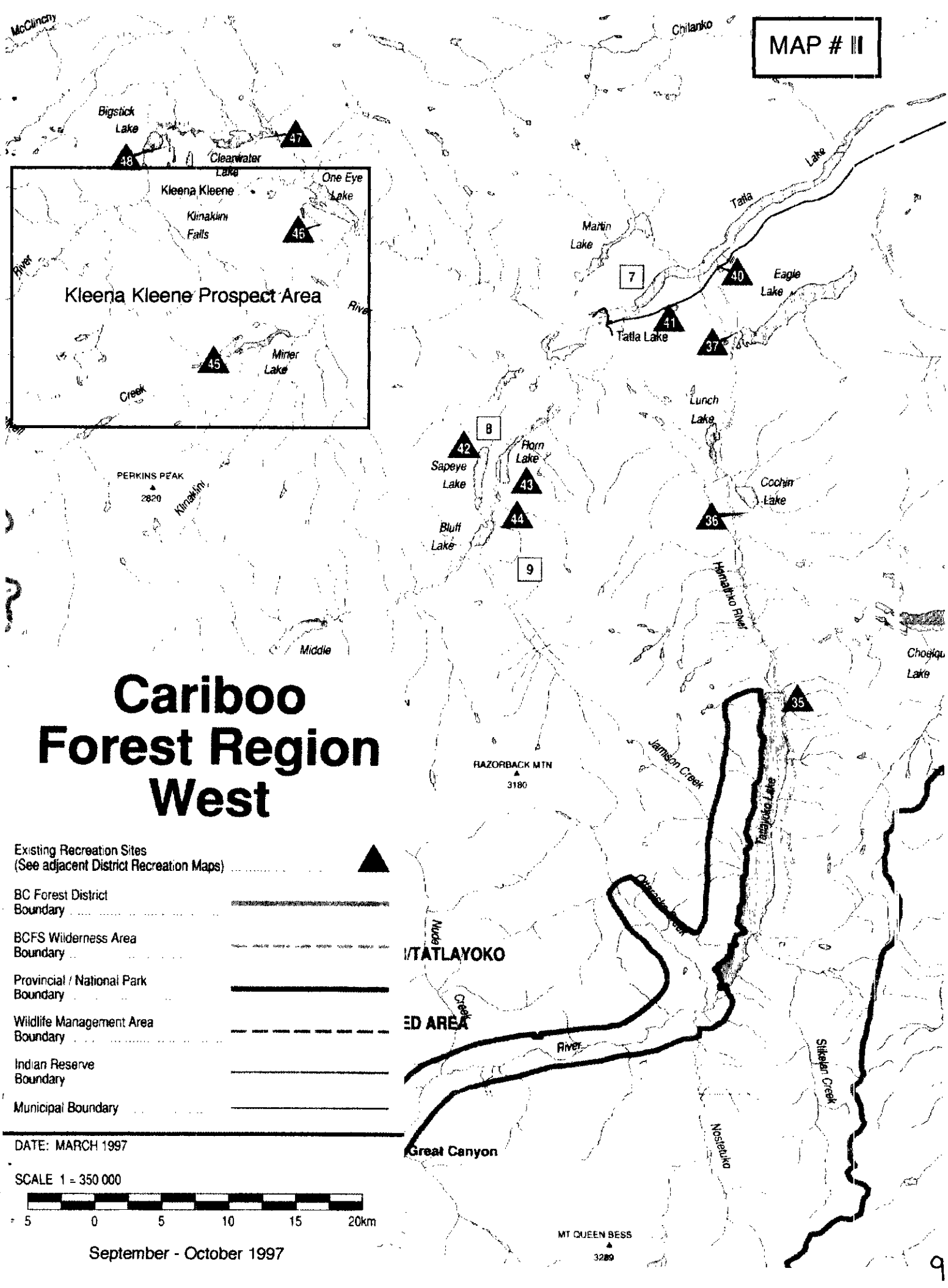
Description of mineralization, host rocks, anomalies

See Sample Descriptions and Maps attached.

Conclusion

The Prospectors Assistance Program was very much a success, as without the extra funding, staging an exploration expedition into the Kleena Kleene prospect area would have been highly improbable. The limited access to the area is daunting to the individual prospector, and the funds provided made the expedition possible. Contact areas found, were as exciting as one could expect. The amount of time and work just to reach outcrops, was considerable. It is for this reason that more work was done in the Kleena Kleene area, (and the Bella Coola area, was forsaken.)

For the future, an extremely interesting area to explore, is between Finger Peak and the 'great cliff' (see maps). Access is again the primary consideration, however, the access problem has prevented this area from being mapped and explored in the past. Who knows what can be found there (quien sabe?). The writer hopes to return and continue exploring to the south. This area is cut through by a strong, normal fault to the Tchaikazan Fault. (Hopefully the weather will be better.)



Cariboo Forest Region West

Existing Recreation Sites (See adjacent District Recreation Maps)

BC Forest District Boundary

BCFS Wilderness Area Boundary

Provincial / National Park Boundary

Wildlife Management Area Boundary

Indian Reserve Boundary

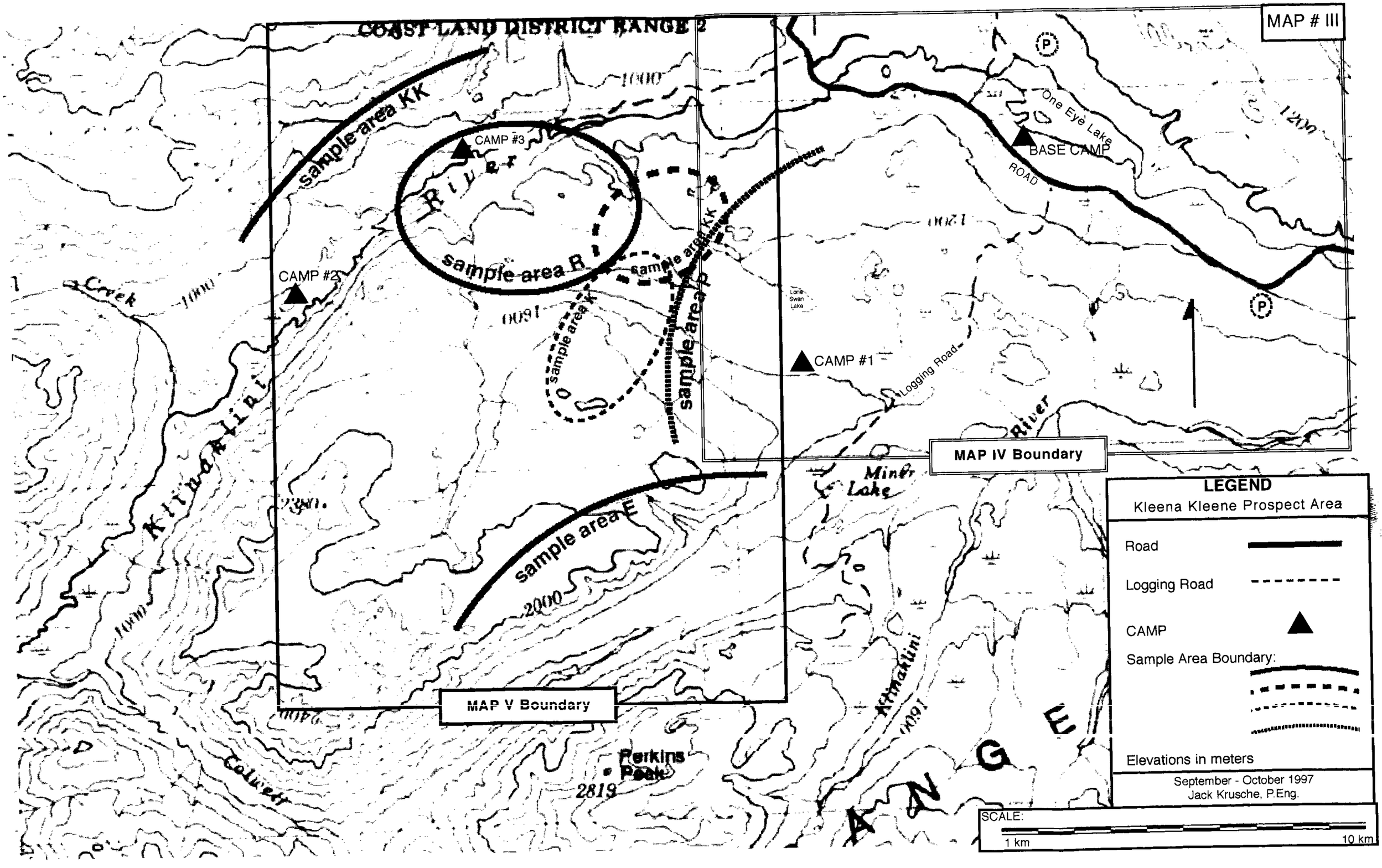
Municipal Boundary

DATE: MARCH 1997

SCALE 1 = 350 000

5 0 5 10 15 20km

September - October 1997


COAST LAND DISTRICT RANGE 2
MAP # III
sample area KK
CAMP #3
River
sample area R
CAMP #2
Creek
sample area KK
sample area K
sample area P
One Eye Lake
BASE CAMP
ROAD
Lone Swan Lake
CAMP #1
Logging Road
River
MAP IV Boundary
Miner Lake
sample area E
2000
MAP V Boundary
Perkins Peak
2819
Colwell
Athmaklini
LEGEND
Kleena Kleene Prospect Area
Road
Logging Road
CAMP
Sample Area Boundary:
Elevations in meters
September - October 1997
Jack Krusche, P.Eng.
SCALE:
1 km
10 km

MAP # IV

N

KlinaKlini River

One Eye Lake

BASE CAMP

P50

P51

P42

P43

P41

P40

P 3(boulder)

P1

P 2

P17

P16

P10

Lone Swan Lake

P 4

CAMP 1

granitic(?) boulder (till)

River

LEGEND

Kleena Kleene Prospect Area

Road

Logging Road

Camp

Sample:

Rock (outcrop): R

elevation in meters

September - October 1997
Jack Krusche, P.Eng.

SCALE:

1 km — 10 km

KK40
N
R3A
RKK1
RKK2
CAMP# 3
RS 4
RS 1
KK49
R 1
R 2
R 3
R
SS 1
RS 2
R 4
RS 3
R8
R7
RS10
KK51
KK50
KK52
R11
G 2
S 1
P32
R
P31
P30
KK51
KK50
G
K53
S 5
K54
K55
CAMP 5
S 3
S 4
KK55
Finger Peak
S 2
P29
K20
K 13
K 14
K 11
K 10
P28
K 3
K 2
K 1
S-01
S-02
R
E10
E12
E13
E11
E14
E16
ES11
E18
E17
R
E9
E8
E5
E6
E4
E3
E2
E1
2000
LEGEND
Kleena Kleene Prospect Area
Rock R
Camp ▲
Sample: ●
Elevations in meters
September - October 1997
Jack Kruschke, P.Eng.
SCALE:
1 km
10 km
Perkins Peak
2819
MAP # V

SAMPLE LIST :

QUARTZITE - CHERT (?) - This term was used here to describe abundant silicious rocks in the area. The aphanitic texture of these rocks resembles chert. (Yet the term chert is generally associated with sedimentary sequences where as the term Quartzite implies a metamorphic rock with coarser texture.)
Note: similar, commonly brecciated silicious rocks were observed by the writer in the Osoyoos District of B.C., west of Farleigh & Brent Lakes. These rocks were associated with volcanics near the boundary of batholiths.

SAMPLE AREA E:

Samples E1-9, are from the eastern edge of the mountain on the west side of the valley, west of Perkins Peak. (see Map III/V). they represent an approximate cross section from south to north covering a distance for approximately 2-3 km. The mountain itself, rises steeply from the valley floor about 1400 meters vertically. The cliffs show interesting colours ranging from green to red, and the scree slopes weather from grey to black. The face of the mountain in places is folded and twisted. In places the weathering rocks, normally hard and solid, are red, rusty, and flaky. These samples are southwesterly of the canyon that cuts the cliff face. Access is from km. 14 on the Miner Lake road, by all terrain vehicle, then by foot. (SEE PHOTO #1)

- E1
  - A. Hornfels, black to dark grey, angular, shattered, fractured (?), silicified, shot through with quartz veins, in every direction, from 0.5 mm to 2 cm, some with quartzite - chert (?), some porous cavities, small pirates - 3%
  - B. Hornfels, black, weathering to rusty brown, red, cryptocrystalline, very small pyrites, up to 30%, up to 3mm long; some quartz veins, micro size to 3 mm
- E2
  - A. Hornfels, dark grey to grey, weathering to brown , rusty red, light green; microcrystalline; quartz veining with cavities - some filled ; schisted; some pyrites; non magnetic
  - B. Hornfels; as above; weathering to a blacker color from dark brown, fractures less angular
- E3
  - A. North - Hornfels, dark grey to black, cryptocrystalline, silicified; glistening; broken edges are very sharp; some quartz veining; not weathering to rusty - no pyrites(?); non magnetic
  - B. South - Hornfels; dark grey to grey, cryptocrystalline, weathering to rusty brown, red, many very fine pyrite - up to 60%, up to 0.5 mm; non magnetic
- E4
  - A. Hornfels, contact with Diorite; dark grey to greenish grey, Diorite creme white, all weathering to rusty red and brown; cryptocrystalline grading to crystalline, some pyrites - 5%; non magnetic
  - B. Hornfels; black to dark grey; porous, vesicular - 2 mm to 1 cm; weathering to very rusty brown and red, many pyrites emplaced - up to 2 mm; creme - white quartz veins, from 1 mm to 2 cm; non magnetic.

PHOTO #1

- C. Hornfels; dark grey, weathering to a very glossy, shiny, dark brown, almost black platy surface, reflecting bright green, blue and violet

- E5 - Hornfels, a collection of sharp, flint like fragments, breaking conchoidally; many very fine pyrites, up to 0.5 mm - 30-60%; weathering to rusty brown, dark red to black, shiny green, blue, violet (iridescent). These pieces show a very high tensile structure, signs of extremely rapid cooling; THIN SECTION

- E6 - A. Hornfels; black; cryptocrystalline; quartz veins from 1mm to 3 cm; big vein vesicular with infillings, pyrites (?) weathering to red and black, one pyrite collection dark sliver colored, lustrous , platy, very soft, scratchable by fingernail, malleable; Hornfels weathering to dull grey; non magnetic; silicified; see photo.
  - B. quartzite - chert (?); grey; aphanitic; angular fracture; this is from the crack in the cliff face as a vein, the walls on each side of the crack are made of the Hornfels. SEE PHOTO #2
  - C. quartzite - chert (?); same as above, but quartz vein 2 mm white through sample, SEE PHOTO #3
  - D. Tuff (?); light grey; fine grained; silicified; rusty pyrite crystal 3 mm long, lustrous, scree.

- E7 - A. Hornfels; black; cryptocrystalline; contacting with diorite (?) or is it phenocrystic or it phenocrystic; very fine pyrites; shiny, weathering to rusty red. Pegmatitic (?)
  - B. Tuff (?) - Hornfels (?); grey; very fine crystals, silicified.

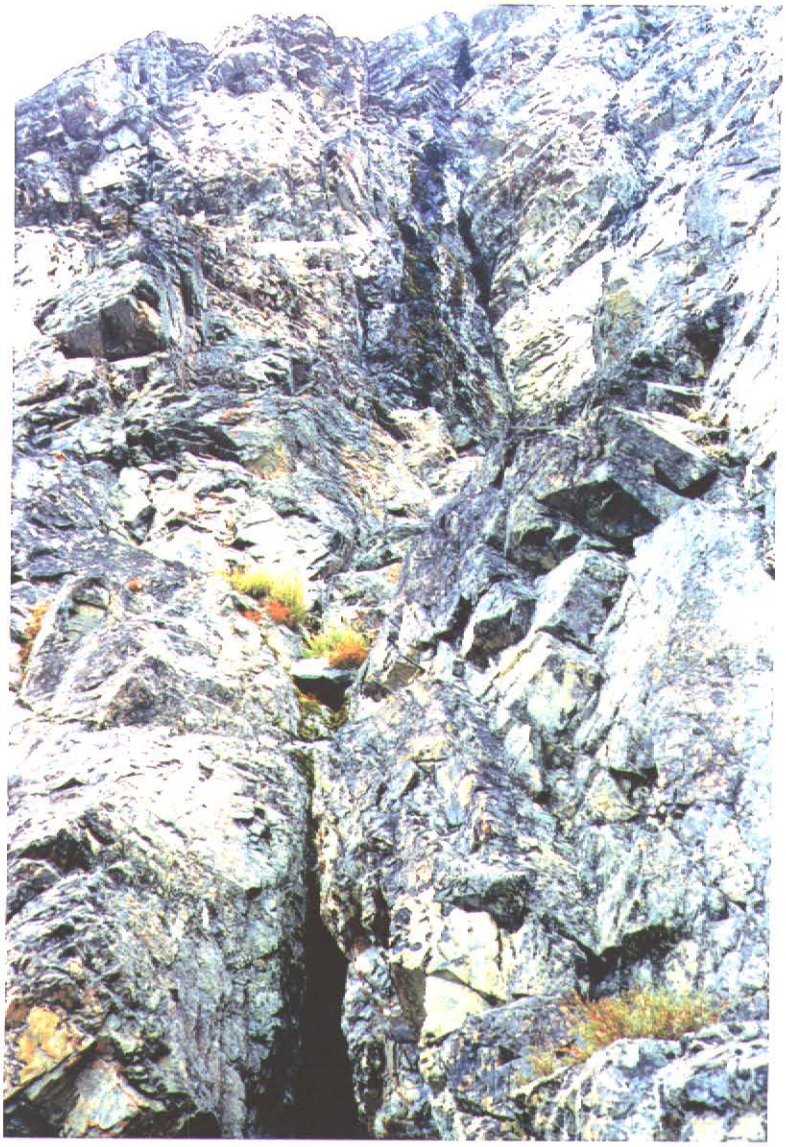
- E8 - A. Hornfels (?) - Tuff (?); greenish-grey, cryptocrystalline, blebulous quartz - vesicular, filled with very dark brown to grey, quartz is creme white to dirty grey; non silicified; slight slickenside.
  - B. same as above ANALYZE

- E9 - A. quartzite - chert (?) - diorite leftovers(?), light grey to brownish grey; very fine to medium crystalline structure; speckled appearance, black, brown, tan, rusty red ; pyrites.
  - B. Hornfels; black; cleavage rounded and angular; pyrite - 20-30%, cryptocrystalline; rusty; weathered.
  - C. Hornfels; dark grey to light grey; cryptocrystalline with phenocrysts and vesicles up to 3 mm; weathering to rusty brown and brown , iridescent
  - D. same as above

Samples E10 - 18 are from the north and eastern edge of the mountain west of Perkins Peak. (see Map III/V). The samples represent a cross section from north to south, at two elevations: approximately 1600 meters and 1400 meters. The higher elevation being on the cliff face. Samples E10-15 (except ES-11), from the higher cross section. In general the rocks to the north of the canyon are rounder than the cliff faces to the south of the canyon - which are much more rugged and form long scree slopes.

Rock outcrop described from base to top of the outcrop.

Photo #2



Sample Area E.
Looking SW.
Sample E6 B.
Close up of the crack.

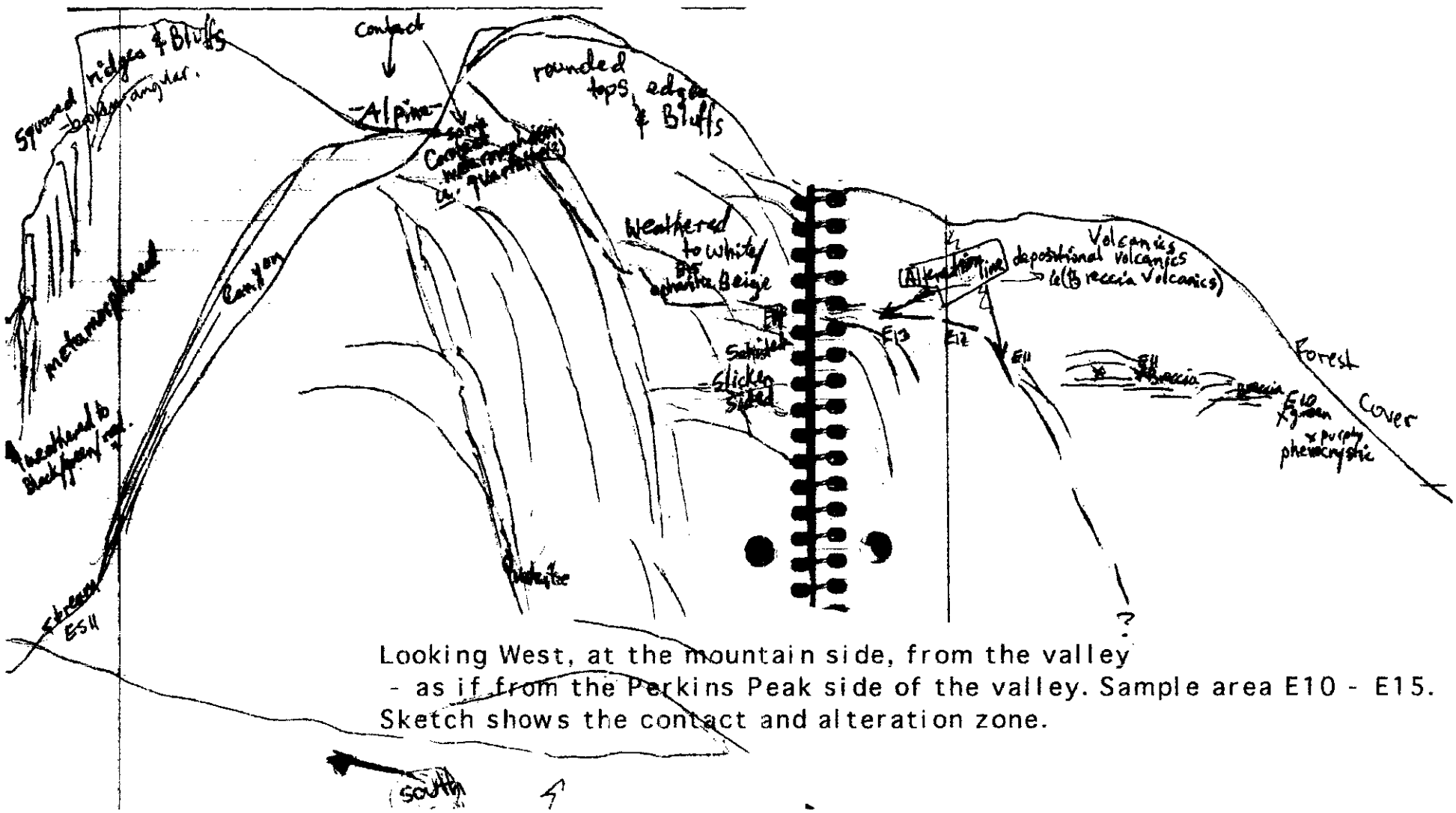
Photo #3

To the right of above. (N.)

Sample E6 C.

Volcanic sequence lighter in colour than P10 - 17. Probably more acidic lava. Particularly: free quartz inclusions observed in the bright green sequence B. Further up flow structure will be quartzitic, observed in E. SEE SKETCH #1

- E10 - A. Volcanic Rock; medium to light gray; fine grained with (30 %) distinct white euhedral phenocrysts, Orthoclase (?), average 1 mm. to 3 mm. in size, also tiny block crystals visible.
  - B. grading to bright green similar rock, but with larger phenocrysts and free quartz inclusions. Locally brecciated, chloritic(?).
  - C. grading to Breccia - Conglomerate (?); with poorly sorted fragments of A. and B., and a surrounding mass of volcanic rock; gray; crystalline as above, fine uniform phenocrystic; silicified ash(?).
- E11 - Same as E10 C., fragments are angular to rounded fine crystals, to conglomerate pebbles.
- E11S - a stream sediment sample, from the stream flowing out of the canyon that cuts the mountain, and flows from the alpine down .
- E12 - Diorite (?); cream coloured; distinct flow texture.
- E13 - Breccia as E11; silicified in patches; cement locally very fine grained. Contact concealed.
- E14 - Muscovite Schist; greenish gray;
- E15 - Hornfels (?); gray; non silicified.
- E16 - as above; Similar to E15, with scattered white dots, (5%); weathered crosses, light to dark grey; very fine grained.
- E17 - As above; remnants of micro fragmented texture.
- E18 - Very weathered rock; white clays enclosing Quartzites,white to light gray; cryptocrystalline to finely crystalline; spotted locally with darker minerals - very fine to medium in size.



Looking West, at the mountain side, from the valley - as if from the Perkins Peak side of the valley. Sample area E10 - E15. Sketch shows the contact and alteration zone.

Sketch #1

SAMPLE AREA P:

Samples P1 and P2, from outcropping, partially covered rocks, approximately 2 Km. North of from the east-west centre, of Lone Swan Lake (see Map III/IV), which is 1 Km. North of Camp #1. Similar to rocks found on trend to the west.

- P1 - Lava Rock (Andesite (?)) Breccia - Conglomerate(?); cement is gray to greenish, some pinkish; very fine grained; sub angular fragments in the matrix, 1/2 - 3 cm. matrix silicified, and fragments are quartzitic gray to dark gray. Some signs of flow structure (?) or pressure striations (?).
- P2 - Lava Rock (Andesite (?)); gray to purple colour; filled with small phenocrysts, 80%, up to 1 mm. Some micro quartz veins visible, 0.1 - 0.5 mm.; not silicified. Very magnetic.

Sample P3 is from a boulder pile, approximately 1/2 Km. North of samples P1 and P2.

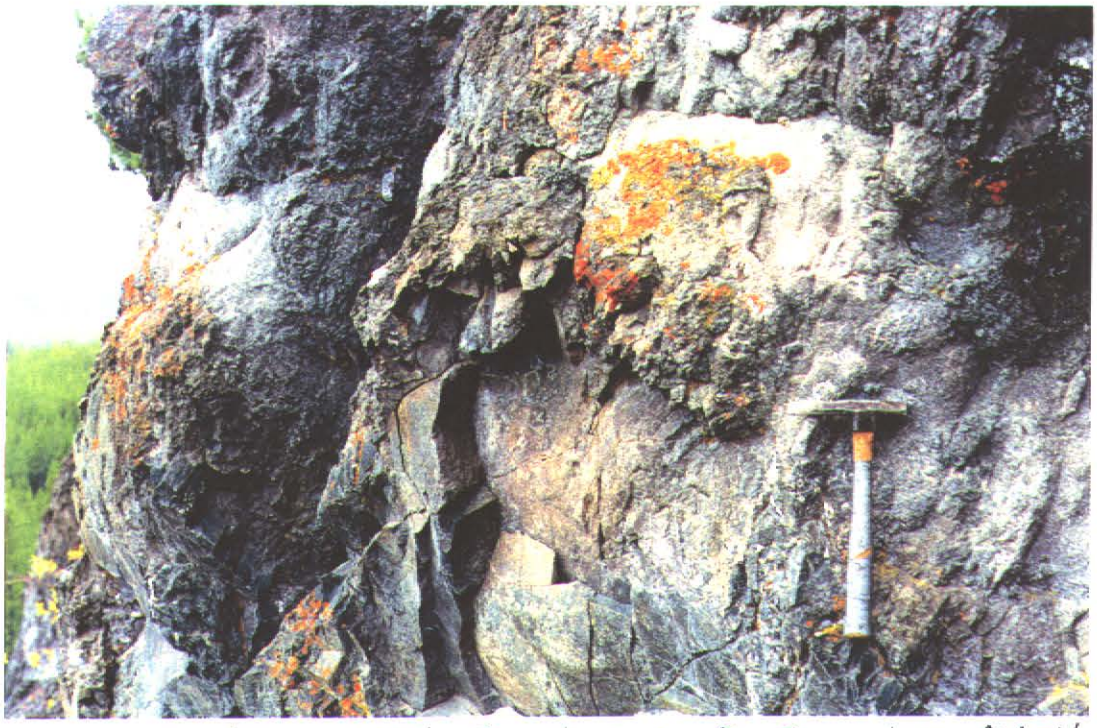
- P3 - A. Tuff (?); Altered(?); creamy white to sandy beige, micro crystalline, phenocrysts and filled vesicles - no pattern, from 1/2 mm. - 1 cm., dull rusty brown; and smaller dark gray phenocrysts - silicified feldspar (?); the whole mass is striated/banded; everything silicified; weathered to rusty brown. Not magnetic.
  - B. 50 meters further north. Same as above.

Sample P4, is from an outcrop of angular rock, approximately 5 meters high, 20 meters long, striking on trend with all other ridges and outcrops in the country, NNE. P4 is at CAMP #1, which is 1 Km. South of Lone Swan Lake, (see Map III/IV), that is south of the south shore of the lake, at it's approximate east-west centre. A - C. cross section from east to west. A breccia (?).

- P4 - A. Lava Rock (Andesite (?)); dark gray to greenish gray; very fine structure; phenocrystic, 80%, of feldspar, 1 - 3 mm., non magnetic; all silicified.
  - B. Similar to A.; Breccia - Conglomerate (?); less phenocrystic, however more silicified, sub angular fragments of quartzite (?) 1/2 mm. - 3 cm., and some black globular fragments, 1 - 2 cm., nothing magnetic; some rusty weathering.
  - C. Similar to B.; pinkish quartz vein.

Samples P10- P17, are from the butte, approximately 1 Km. to the North of Lone Swan Lake (see Map III/IV). The butte (SEE PHOTO #7), is a ridge formed by hard, dense, Andesite, with small phenocrysts of feldspar, 1/2 - 1 mm. The south and east faces of the butte, break away with massive breccias of included country rock (Andesite), the breccia cement is grey, sandy, and phenocrystic. When there are few encrustations the breccia weathers easily, however when the breccia has approximately 80% encrusted rock, it is hard and forms small pinnacles 1 - 3 meters across, and 2 - 3 meters high. The butte itself, on the eastern half, is shot through with small quartz veins 1 to 4 cm. across. The quartz is pale milky white in places, in others, it is translucent and pinky, greenish, or greyish. (There is a bear rumbling and growling nearby.) In some places the veins are continuous and are causing the butte to erode, in others the quartz is emplaced as blobs, making inclusions up to 6 cm. wide. SEE PHOTO #4 , PHOTO #5, & PHOTO #6.

Photo #4



Looking West, Sample are P. Samples P10-16

Photo #5

Close-up of above

- P10 - A. Lava Rock (Andesite(?)); dark gray; grading from fine grained like P11 A., to medium crystalline, with shiny plagioclase crystal faces.
  - B. Lava Rock (Andesite (?)); very weathered; gray, dull, with 40% tiny , 0.1 - 0.5 mm., dull white phenocrysts, or these may be filled vesicles.
- P11 - A. Lava Rock (Andesite (?)); medium gray, very fine grained, with bright green chloritic (?) patches, locally grading to vesicular tiny vesicles filled a white mass. SEE PHOTO #4.
  - B. Quartz Veins; containing sharp fragments of A. in them. The quartz is mainly as white chalcedony, only locally as white crystals.
- P12 - Lava Rock (Andesite (?)); dark gray; medium crystalline like P10 A.; some visible biotite. Good example for THIN SECTION, to determine if Andesite.
- P13 - Similar to P11 B; quartz veins with encrusted Lava Rock (Andesite (?)); veins 2 - 8 cm., milky white, some coloured tinges of pink, green, etc.
- P14 - Similar to P11 B; many quartz pieces.
- P14B - Similar to P11 B.
- P15 - Lava Rock (Andesite (?)); similar to P12 and P10A; local metallic(?) luster, in the medium crystalline parts; quartz veins. ANALYZE.
- P16 - Lava Rock (Andesite (?)); grading like P10 A. (type of grading), and cut by quartz veins, in a ratio of 3 : 1, (rock to quartz veins. Observation: the veins cut across the rock, therefore the veins are younger.
- P17 - Similar to P13; milky gray quartz.

Sample P28 is close to the bend in stream S1, where it bends to the NW, after flowing down the mountain towards the North. See Map IV. It is approximately 100 meters east of stream S1, and 100 meters southeast of the bend in the stream.

- P28 - Hornfels(?); dark gray; very fine grained, weathers to soft brown; magnetic.

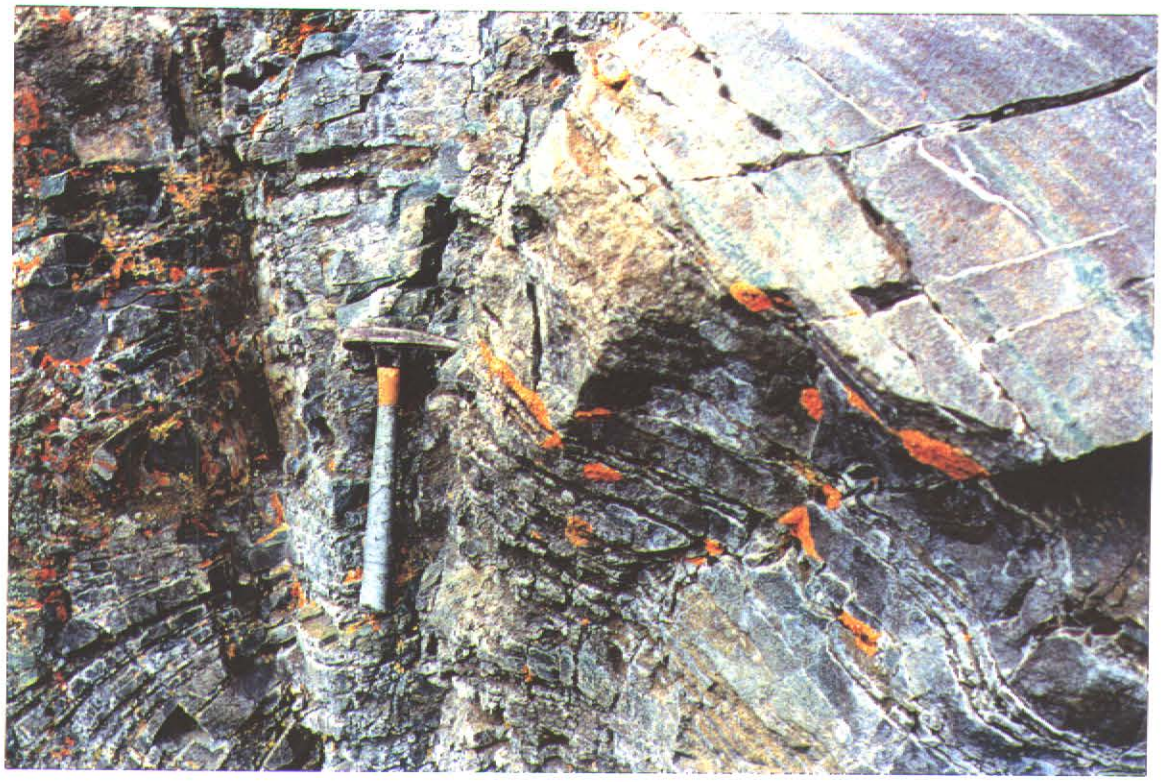
Sample P29 is approximately 600 meters north of sample P28. (see Map III/IV).

- P29 - A. Hornfels; gray to greenish gray; fine crystalline structure; small vesicles with black fillings, up to 0.1 mm., some (1%) quartz pieces in place, 0.1 mm. - 2 mm.; magnetic.
  - B. Tuff (?); sandy beige to gray colour; fine - medium grained; up to 5% feldspar phenocrysts, 0.1 mm - 1 mm.; soft; non magnetic.

Samples P30-32, are from a cross section of an outcropping hill, approximately 1400meters north of sample P29. The outcrop is partially overgrown by brush and windfall - so a continuous cross- section was impossible. The hill is on trend with the butte 1km. north of Lone Swan lake. (see Map III/IV), to the east. The outcropping hill gradually rises about 20 meters, and is about 120 meters long. Contacts of P30, P31 concealed.

- P30 - A. Lava Rock Andesite (?) - Breccia (?); not silicified.
  - B. Quartzite - Chert (?); beige crystalline, brecciated, fractured; some porosity,

Photo #6



Sample area P. Sample P11.

Sample Area K

Photo #7

Looking West ↑ The ridge on the right makes a line WNW, on trend with further ridges and outcrops. Sample are P.

vesicular, due to leaching (?).

- C. Hornfels (?); similar to K1 and K2; non magnetic.

- P31 - A. Quartzite; light green veins in a light beige, fine crystalline massive, dotted with black pyroxene or amphibole crystals, Probably silicified volcanic ash.
  - B. Agglomerate (?); the rock is completely weathered to white clay, 'chalky' appearance; within this - remnants of very poorly sorted, rounded to angular fragments of quartzite - chert (?); similar to P30 B.
  - C. Floats (?) or in place (?); Lava Rock (Andesite (?)); dark gray, very small phenocrysts, abundant white feldspars (?), 1 mm. long - 0.1 mm. wide.
  - D. Lava Rock (Andesite (?)); as above; non phenocrystic.
- P32 - A. Agglomerate or Breccia; similar to 31B, but better preserved. Excellent, abundant, large angular fragments - visible, 1/2 - 3 cm.
  - B. Lava Rock (Andesite (?)); similar to 31D.
  - C.

Samples P40 - 43, are 4 Km. Southeast of the Southeast end of One Eye Lake, (see Map III/IV). They are from freshly exposed outcrops on both sides of highway # 20.

- P40 - Lava Rock (Andesite (?)); light bright green; similar to P43, but brecciated; angular crystal fragments, 1/2 mm. - 2 cm. in size. A result of pressure ?; the rock fractures into rounded uneven chunks; calcite veins and calcite crystals.
- P41 - Same as above.
- P42 - Same as above.
- P43 - Lava Rock (Andesite (?)); beet red; very fine grained, uniform, massive and heavy, but repeatedly cut (every 2 cm., by roughly parallel sheets of calcite - deposited in their hairline to 1/2 cm. wide fractures.) The rock fractures into angular, elongated blocks.

Samples P50 - 51, are from the north shore of One Eye Lake, at its north west end. (See Map IV.) The outcrops were studied to verify and compare the described and expected geology of the lava plateau as reported in the literature. Very little outcroppings are to be found here, although ridges are parallel with those south of the lake, in the areas of Samples K50-55. These ridges however, (north of One Eye), are not as steep, or sharp - i.e.: not like buttes.

- P50 - Lava Rock (Andesite (?)); gray to light gray, weathering to black and rusty brown, fine grained, with phenocrysts, (feldspars(?)), up to 80%, 1/2 mm. - 1 cm.; porous micro holes, some with black - up to 0.1 mm.; very magnetic.

A sand sample, as requested by the geologist for industrial minerals from the Ministry, who asked that when clean sand is found that samples should be taken.

- P51 - Very fine grained; 80 % beigey, 10 % gray, 10% black.

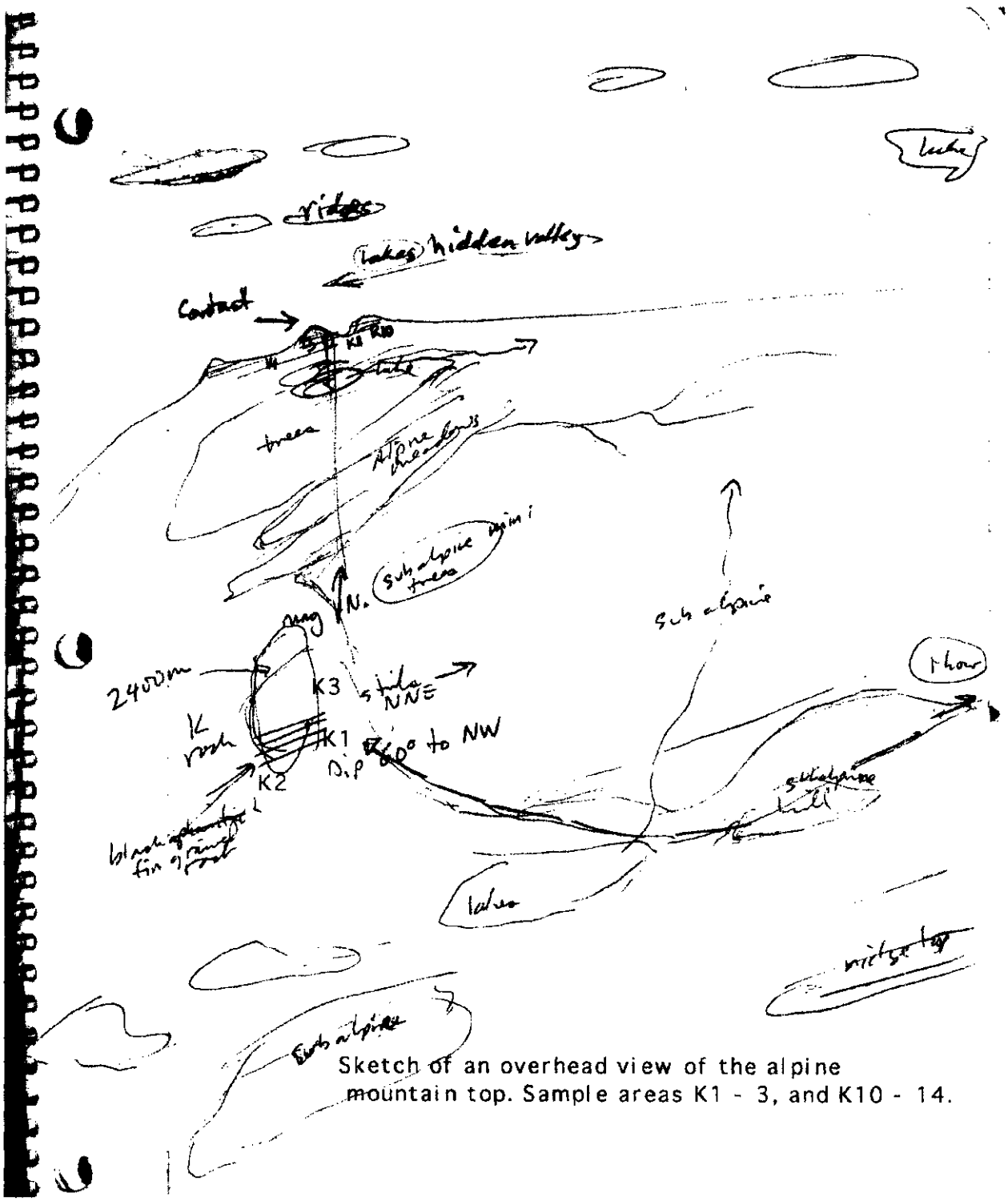
SAMPLE AREA K:

Samples K1 - 3, are from an outcropping peak, on the alpine plateau, near its eastern, north end. (See map III/V.) From the rolling plateau the outcrop gradually rises approximately 200 meters. The outcrop is about 200 meters long on top, the rock face breaking in angular fragments. Strike is the usual NNE, and dip is about 60° to the NW. SEE SKETCH #2

- K1 - Hornfels; (see 50A); non -magnetic; less rust, waxy, slickenside.
- K2 - Hornfels; as above.
- K3 - A. Quartzite - Chert (?); light gray; aphanitic; contacting with hornfels; non magnetic.
  - B. Hornfels; angular fragments of A in it; 2 - 4 mm., non magnetic.
  - C. Silicified Hornfels; vuggy, phenocrysts of feldspar (?), non -magnetic.

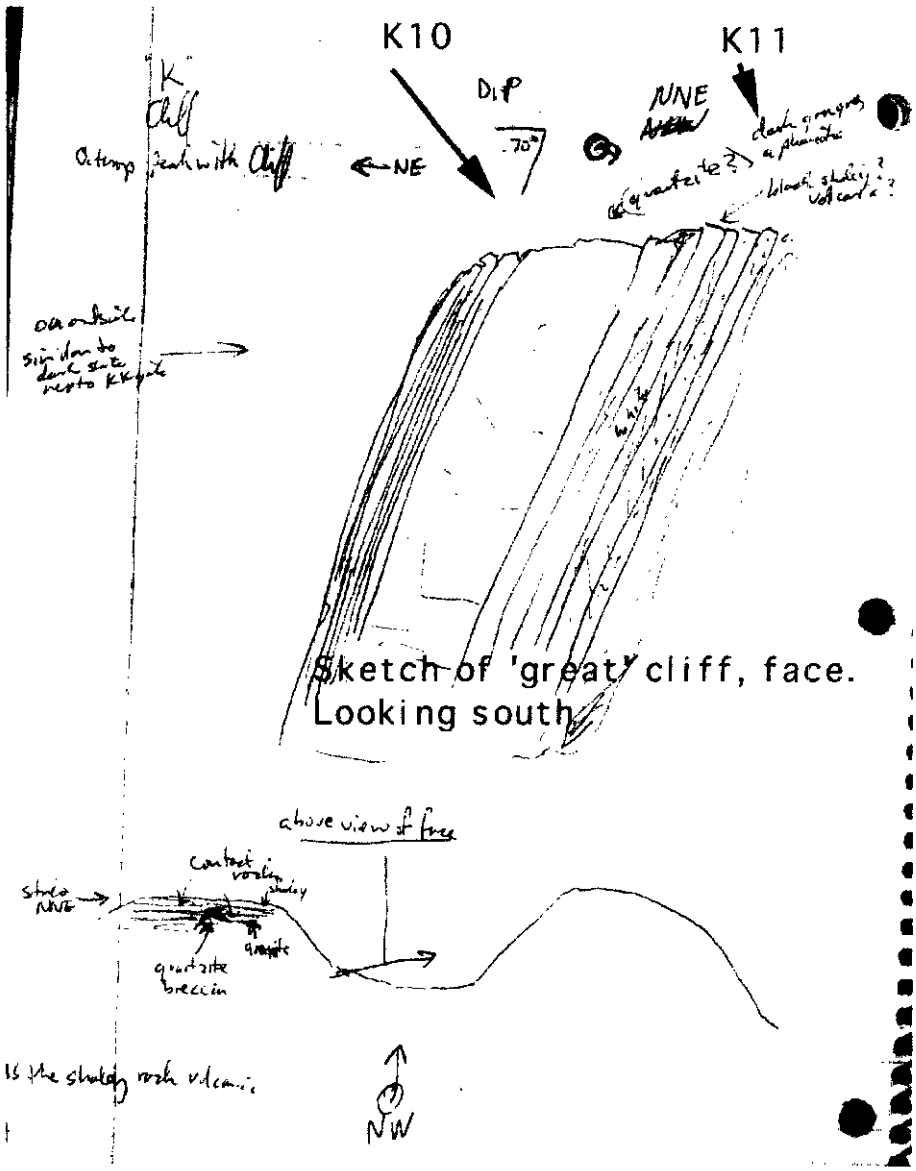
Samples K10 - 15, are from an obvious contact zone, on the edge of a great cliff - visible for miles, even from Kleena Kleene and Highway #20. (See Map III/V.) The cliff top is approximately 2.5 km. north (magnetic) from Samples K1 - 3. The cliff face is about 1000 meters high, facing north. Approach is possible, only from the south. The samples represent a cross section of the cliff top, from east to west. Their is minor banding on the east end of the cliff, which gets bigger and more frequent to the west. The rock changes from hornfels in the east to diorite in the west. The banding being quartzitic and aphanitic between the hornfels, ranging in width from a mm. to 2 meters in the middle (sample K11.) Looking at the cliff face from the north through binoculars one can see signs of twisting and folding of the bands - but this is not visible on top of the cliff itself The apparent strike, as measured from the cliff top, is as usual NNE, and dip 70° to the NE. (An unanswered question remains, 'was there altered slate like rock, at the far east end of the cliff face'? - similar to that found near KK? Due to the overhang of the cliff a sample was not obtained - and without climbing gear would be impossible.) SEE SKETCH #2, AND SKETCH #3.

- K10 - Hornfels; (see K50A); contact with light grey Quartzite - Chert (?); can see quartzitic banding, 1 mm - 3 cm.
- K11 - A. Hornfels; non magnetic;
  - B. Quartzite - Chert (?);
  - C. Hornfels; non magnetic;
- K12 - A. Hornfels; non magnetic;
  - B. Diorite; vein(?), contacting with hornfels; sharp dark silicified; non magnetic;
  - C. silicified Tuff (?); looks like sandstone(?), micro crystalline; non magnetic.
- K13 - Diorite; white, coarse;
- K14 - Very Good Examples of the sharp contact found at the cliff face. Bands of Hornfels and Quartzite - Chert (?), grading to Diorite. Bands are from 1 mm. to 2 meters wide (thickest in the centre.) Contacts are sharp. THIN SECTION.
- K15 - A. Diorite; cream, gray, white; some weathering to pink.
  - B. Diorite. Notice that at this end of the cross section; west, there are no more contacts, nor any sign of hornfels. Therefore we have crossed the contact to the pluton side.



Sketch of an overhead view of the alpine mountain top. Sample areas K1 - 3, and K10 - 14.

Sketch # 3


K10
K11
DIP
70°
NNE
NE
Cliff
Sketch of 'great' cliff, face.
Looking south
above view of face
NW

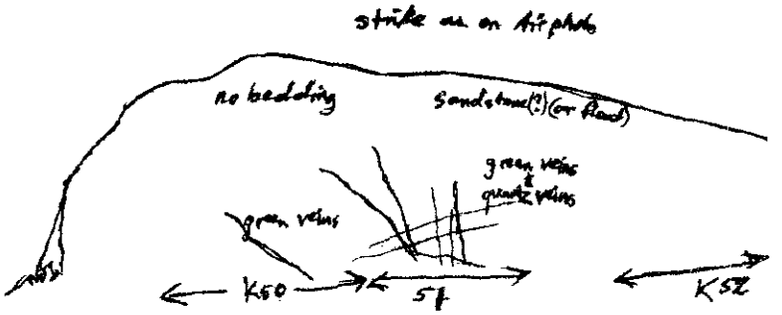
Sample K20 is from an angular boulder, found on a ridge between one of the many creeks falling from the mountain - topped by the great cliff of samples K10 - 15 to the SW. (See Map V.) Although possibly a boulder, this could also be an outcrop, but due to the thick bush verification was not possible. This sample is approximately 3.5 km. NW of sample P28.

- K20 - Hornfels; similar to K50A, but no quartz veins; rusty weathering; slightly magnetic.

Samples K50 - 52, are from a butte shaped outcrop, right on the contact, and in one of the most interesting, and hardest to access areas, of the prospect area. (See Map V.) The butte's face breaks off to the west, and north. To the east it gradually falls to meet the rising ground. (An extension of this ridge, with a dip or break in its top, continues to form the next ridge on trend, the ridge of Sample K53.) The outcropping rock rises about 50 - 70 meters vertically, with a vertical rise of about 20 - 30 meters of the scree slope before it. The face of the rock is almost 1000 meters long, on trend with all the other ridges and buttes, even the one north of Lone Swan Lake. Strike is NNE. Alteration is greatest towards the west end. The actual contact, and fault zone of the area, is covered by a muskeg and a lake - surrounded by windfall. A Moss sample was taken, as it was the only possible sample type possible, about 1000 meters to the south east of the butte. (This was an extremely interesting valley, although grown over, as just to the south east, about 400 meters away was an outcrop of diorite, (samples G1, and G2.) Samples K50 - 52 represent a cross section from west to east of the cliff face. There were many green tinged rocks, and vesicular rocks with quartz infillings. SEE SKETCH #4.

- K50
  - A. Hornfels; dark green, hard with disseminated very fine pyrites (?); magnetic, foliated with white quartz veins. Breaks into sharp, angular pieces.
  - B. Quartzite - Chert (?) Breccia; gray, locally grading to greenish grey, within Hornfels.
  - C. Volcanic Tuff; bright green, grading to greyish; finely grained, with scattered brown rusty spots, (1 - 2 mm.)
  - D. Quartzite - Chert (?); dirty cream, light green; cryptocrystalline, fragmented (fractured?), and porous (due to leaching?); grading to Quartz Breccia (?), locally chloritic - green.
- K51
  - A. Hornfels; (see K50 - A); no Quartz veins, pyrites not visible to the naked eye, waxy, slickenside surfaces; very slightly magnetic.
  - B. Volcanic Tuff; cream coloured; very finely grained; grading to silicified rock (see K50 - D), chloritic.
- K52
  - A. Hornfels; (see K50A); banded with bright chloritic green quartzite veins. Veins have vuggy (leached (?)) porosity, and contain scattered sub angular fragments of gray hornfels rock within them.
  - B. Quartzite - Chert (?); white, green gray to gray; possibly silicified volcanic tuff; very fine grained to cryptocrystalline. Sharp contact - in one sample the rust is concealed.
  - C. Diorite; white feldspar - mainly orthoclase, average 1 - 2 mm., euhedral in 15% dark gray matrix (of hornblende, etc.)

Sketch #1



green veins 1 – 4cm
qtz. veins 1mm – 10cm.

Looking north west, at sample area K50 - 52.

≈ K — 500m —→

Sample K53, is from another outcropping butte, more tree, bush and windfall covered however, and approximately 500 meters ESE from sample K52. (See Map V.) In between is a smal valley, or break, bush covered, where some geological changes must take place. In general these two ridges, and those to the ESE, rise to the east in elevation. The outcropping rock of K53 is all very dark red in colour.

- K53 - Diorite; dark brick red, all weathered; orthoclase and plagioclase feldspar, average 2 mm., about 85%. A few fragments of hornfels (?), average diameter 1 cm. within diorite.

Sample K54 is from another windfall covered ridge, on trend to the ESE, approximately 1000 meters from Sample K53. (See Map V.) 500 meters on the way from K53, is a valley/gorge, made by stream S1, from which a stream sediment sample was taken. The ridge itself continues to the ESE with a dip in it, and 500 meters away is sample K55.

K54 - A. Silicified Conglomerate (?) - (Quartzite - Chert (?)); dark gray to reddish; fragments angular to rounded, irregular, 1 - 30 mm.; 15% dark gray (magnetic), hornfels fragments, 5% quartz pebbles, 20% gray rock.
- B. contact with reddish Diorite; (See K53).

500 meters ESE, and on trend, on another ridge, from sample K53. The trend continues to the outcropping ridge, approximately 2.5 km. to the ESE of samples P30 - 32.

- K55 - Hornfels; similar to K50A; dark gray , non magnetic, fractured, fissures up to 2 mm. wide filled with dark green gray crystals - minerals(?). THIN SECTION.

Samples G1 - 2, are from a ridge, forming a parallel line to the ridges of samples K50 - 52, K53, K54, etc.; but this ridge line is more to the south, about 500 meters. This ridge does not continue on trend to the ESE however, as there is a minor fault, and it ends. Otherwise the ridge itself is similar in size and shape, of a completely different rock.

- G1 - Diorite; Same as G2.
- G2 - Diorite; creamy white; coarse grained, 2 - 3 mm. average.

SAMPLE AREA KK:

Sample KK40 is from the north westerly end of the prospect area. (See Map V.) It as above the Klinaklini River valley which is to the south. Approximately 6.5 km. NW. of Camp # 2. In an area over grown with trees, with very few outcrops, this was some country rock sticking out of th ground in short, angular broken ridges, a meter long and perhaps 1/2 - 1 meter high.

- KK40 - A. Lava rock (?); dark grey to black, very fine grained, vesicular, magnetic, plagioclase.
  - B. Lava rock (?) , same as above, lighter colored: grey, more phenocrysts - up to 80%, magnetic.
  - C. Same as above, lighter colored: light grey to beige.

Sample KK49 is a sand sample, 2 km. west of Camp #2. (See Map V.) The sand is very clean and pure, and covers an area of about 2 km.^{2}.

- KK49 - Sand, beige, 80% fine grained, 20% medium grained.

Samples KK50 - 55, are approximately 1.5 km. NNW of Camp#3. (See Map V.) The outcropping rock, forms a cliff face about 50 meters high, trending NW. The exposed rock face is about 100 meters long. A brecciated rock was found on the bottom of the cliff face, with a microcrystalline rock on top. A slate like rock weathering to sandstone in colour and texture was also found here - but not outcropping. Is it a float or from a boulder, or did it fall from the inaccessible cliff top ? (Its angular and fragile nature seems to indicate it is local.)

An interesting note: On the cliff face made of very hard rock, were long scratches across the face. Some scratches could be made from falling rock, however most of the scratches were horizontal. The scratches were 1/2 - 1 " in diameter, and gouged up to 1/2 " into the rock! They were straight and from 1 to 2 meters long. All were fresh looking. There were also old scratches visible. SEE PHOTO #8.

- KK50 - A. Hornfels, black, cryptocrystalline, not silicified, very shiny crystals, 2mm quartz vein; weathers to rusty color and grey, non magnetic
  - B. Conglomerate cement - (Tuff), grey, cryptocrystalline, angular, massive. SEE PHOTO #9.
  - C. Siltstone (?) - (Tuff) (?), grey to light grey, vesicular, feldspar (?) (5%, 1-2mm)
- KK51 - Slate, black, layered, 1-2mm, weathering to rusty brown or beige, broken rusty face shows colors of the spectrum. This is a textbook example of slate, where is it from? Contact hidden.

This sample KK55, was found next to Camp#3. (See Map V.) It seems to be similar to the rock found on top of the pinnacle SW. of Camp #3. This pinnacle , locally referred to as Finger Peak, is edged by layered lava flows at its bottom, turned on their side. The extrusive layers are flows of microcrystalline lavas and breccias alternating one on top of the other. The alternating lava flows extend for 1200 vertical meters, and above that is Finger Peak another 400 meters higher. The pinnacle itself is very green in colour. SEE PHOTO #10.

Photo #8

Looking SW, sample area KK, KK50-51.

Slate found here, also strange gouge marks.

Photo #9

Close up of Conglomerate.
KK50 B

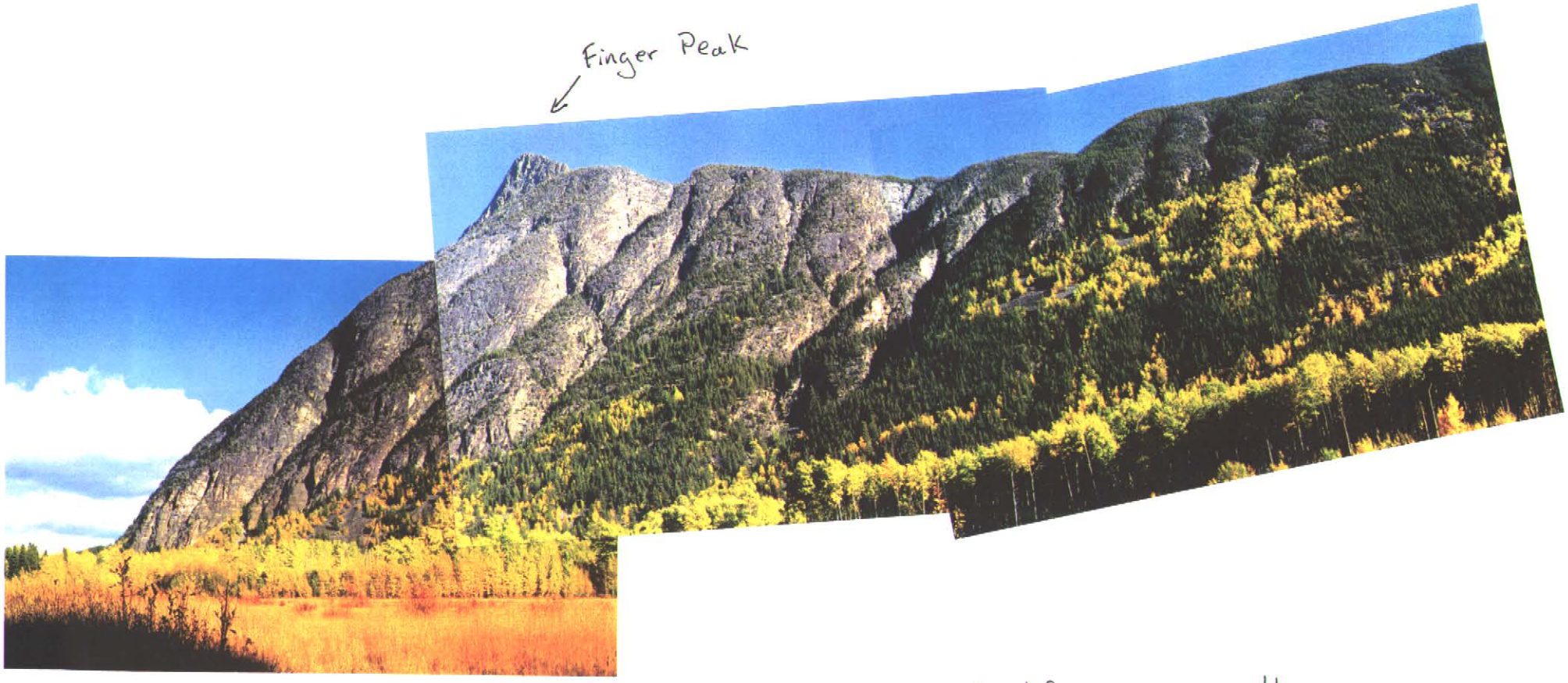
- KK55 - Boulder, possibly form Finger Peak, silicified lava rock (?), vuggy, chloritic, some small, perfect quartz crystals - 3mm long, weathering rusty brown, plagioclase phenocrysts . SEE PHOTO #10.

SAMPLE AREA R:

These samples are from the end of the trend of ridges, extending from east of Lone Swan Lake, to the Klinaklini River valley in the west. The river valley, and fault it runs in, ends the ridges which bend to the south, and fold up, to make the lower sides of Finger Peak. This folding and bending can easily be observed when looking at air photos. The alteration at this end of the ridges is weaker, until one gets to their southern limit on the sides of Finger Peak. Access at this point is very difficult, as the folded ridges form a wall/cliff rising more than a 1000 meters from the valley. SEE PHOTO #10.

- R1 - Conglomerate -Breccia (?); beige to gray to greenish; fine grained matrix.
- R2 - Lava Rock (Andesite (?));black to dark gray; amorphous, porphyritic with white and green phenocrysts; quartz veins along fractures, from 1mm. - 1 cm.; some quartz rusty red with vesicles; non magnetic.
- R3 - Lava Rock (Andesite (?)); black; amorphous very fine grained; dark red rusty quartz veins, 3 mm., thin white quartz veins, 0.1 mm.; dark to light green phenocrysts, 60-70%; weathering to rusty brown; minor slickenside; non magnetic.
- R4 - Lava Rock (Andesite (?)); very dark green, some greenish violet ranging to gray, some purplish blotches 2 - 3 cm. across, appearing as phenocrysts in the mass, very heavy; some quartz pieces scattered through the matrix, 20%; quartz vein along edge of rock, very hard; very slightly magnetic.
- R5 - same as above.
- R6 - A. Lava Rock (Andesite (?)); light green coloured; very fine grained; small black phenocrysts, 5%; some pyrite (?) mineralization, gold - copper colour criss-crossed with quartz, white to milky gray, with vesicles 0.5 - 1 cm.
  - B. As above; more purply colour to light and dark green; contact (?) with quartzite - chert (?); amorphous, silicified; weathering to dark rusty red.
- R7 - Hornfels (?); black; aphanitic; silicified; criss-crossed with quartz veins, 1mm.;very hard; slightly magnetic; some weathering to brownish and pinkish.

R8 - Hornfels (?); gray to greenish; very fine grained; crossed with quartz veins, 3 mm. - 1 cm.; grading to silicification across sample; quartz is vesicular with air bubbles; weathering to rusty red, reddish brown; extremely hard.



Looking across the Klinaklini valley.

Photo # 10

R9 - Lava Rock (Andesite (?));; dark gray; porous, vesicles 10%; phenocrysts 0.5 mm. 3 cm.; silicified; feldspars (?); quartz phenocrysts singly and in groups; quartz veins, milky white to green, 0.5 - 3 cm.; non magnetic.

- R10 - Conglomerate - Breccia (?); greenish with green to gray pebbles; phenocrystic with white feldspar (?), 60%; silicified; pebbles, subangular, gray white, 1 - 2 mm and larger 1 - 4 cm., gray green; weathering to rusty brown, non magnetic - except for one pebble.
- R11 - A. Hornfels(?); black to dark gray; aphanitic; white veins, 0.5 mm., not quartz; non magnetic, not silicified.
  - B. Same as above; phenocrystic 40%; silicified; feldspars (?), 0.5 - 3 mm.; non magnetic
- R3A - silicified calcite; greenish to white; green quartz vein; vesicular ,porous; scree.

Some faulting and hard rocks, make bends in the Klinaklini River. This sample is from the first falls.

- RKK1 - Klinaklini Falls: Breccia - Conglomerate (?); black; fine grained but vesicular and porous, 0.5 mm. - 1 mm.; light beige blotchy spots, 0.5 cm. - 2 cm.; white veins, not quartz.

This sample is from the west side of the Klinaklini Valley, 13 km. along the old logging trail from Highway #20

- RKK2 - A. Conglomerate - Breccia (?); greenish matrix; fine grained, porous, holes 0.5 - 2 cm., pebbles 1 - 3 - 5 cm, pink coloured.
  - B. Conglomerate - Breccia (?); green; fine grained, fractured, silicified; large inclusions, 8 cm.

From a wide open sandy patch of about 15 km.^{2}; on the east side of the river. this patch looks white at night and is a good marker for trail finding. Not much grows there but some pine tress, however the sand excellently picks up recent grizzly tracks.

- RSS1 - Sand sample; gray 80 %, fine grained; 20% black and white; coarse grained.

SOIL/MOSS SAMPLES:

See Maps IV and V.

- S1 -
- S2 -
- S3 -
- S4 -
- S5 -
- S-01 -
- S-02 -
- ES11 -
- RS1 -
- RS2 -
- RS3 -
- M10 -
- RS1 -
- RS2 -
- RS3 -
- RS4 -
- RS6 -
- RS10 -

SAMPLES SENT FOR ASSAY:

S1,S2,S3,S4,S5,S-01,S-02,M10;K10+,K50+,E1+,E10+,P13+,P30+

Photo #11

"First snow"

Photo #12

"Drying day"

PHOTO #12

PHOTO #4

PHOTO #5

- P10 - A. Lava Rock (Andesite(?)); dark gray; grading from fine grained like P11 A., to medium crystalline, with shiny plagioclase crystal faces.
  - B. Lava Rock (Andesite (?)); very weathered; gray, dull, with 40% tiny , 0.1 - 0.5 mm., dull white phenocrysts, or these may be filled vesicles.
- P11 - A. Lava Rock (Andesite (?)); medium gray, very fine grained, with bright green chloritic (?) patches, locally grading to vesicular tiny vesicles filled a white mass. SEE PHOTO #4.
  - B. Quartz Veins; containing sharp fragments of A. in them. The quartz is mainly as white chalcedony, only locally as white crystals.
- P12 - Lava Rock (Andesite (?)); dark gray; medium crystalline like P10 A.; some visible biotite. Good example for THIN SECTION examination, to determine if Andesite.
- P13 - Similar to P11 B; quartz veins with encrusted Lava Rock (Andesite (?)); veins 2 - 8 cm., milky white, some coloured tinges of pink, green, etc.
- P14 - Similar to P11 B; many quartz pieces.
- P14B - Similar to P11 B.
- P15 - Lava Rock (Andesite (?)); similar to P12 and P10A; local metallic(?) luster, in the medium crystalline parts; quartz veins. ANALYZE.
- P16 - Lava Rock (Andesite (?)); grading like P10 A. (type of grading), and cut by quartz veins, in a ratio of 3 : 1, (rock to quartz veins. Observation: the veins cut across the rock, therefore the veins are younger.
- P17 - Similar to P13; milky gray quartz.

Sample P28 is close to the bend in stream S1, where it bends to the NW, after flowing down the mountain towards the North. See Map IV. It is approximately 100 meters east of stream S1, and 100 meters southeast of the bend in the stream.

- P28 - Hornfels(?); dark gray; very fine grained, weathers to soft brown; magnetic.

Sample P29 is approximately 600 meters north of sample P28. (see Map III/IV).

- P29 - A. Hornfels; gray to greenish gray; fine crystalline structure; small vesicles with black fillings, up to 0.1 mm., some (1%) quartz pieces in place, 0.1 mm. - 2 mm.; magnetic.
  - B. Tuff (?); sandy beige to gray colour; fine - medium grained; up to 5% feldspar phenocrysts, 0.1 mm - 1 mm.; soft; non magnetic.

Samples P30-32, are from a cross section of an outcropping hill, approximately 1400meters north of sample P29. The outcrop is partially overgrown by brush and windfall - so a continuous cross- section was impossible. The hill is on trend with the butte 1km. north of Lone Swan lake. (see Map III/IV), to the east. The outcropping hill gradually rises about 20 meters, and is about 120 meters long. Contacts of P30, P31 concealed.

- P30 - A. Lava Rock Andesite (?) - Breccia (?); not silicified.
  - B. Quartzite - Chert (?); beige crystalline, brecciated, fractured; some porosity,

PHOTO #6

PHOTO #7

vesicular, due to leaching (?).

- C. Hornfels (?); similar to K1 and K2; non magnetic.

- P31 - A. Quartzite; light green veins in a light beige, fine crystalline massive, dotted with black pyroxene or amphibole crystals, Probably silicified volcanic ash.
  - B. Agglomerate (?); the rock is completely weathered to white clay, 'chalky' appearance; within this - remnants of very poorly sorted, rounded to angular fragments of quartzite - chert (?); similar to P30 B.
  - C. Floats (?) or in place (?); Lava Rock (Andesite (?)); dark gray, very small phenocrysts, abundant white feldspars (?), 1 mm. long - 0.1 mm. wide.
  - D. Lava Rock (Andesite (?)); as above; non phenocrystic.
- P32 - A. Agglomerate or Breccia; similar to 31B, but better preserved. Excellent, abundant, large angular fragments - visible, 1/2 - 3 cm.
  - B. Lava Rock (Andesite (?)); similar to 31D.
  - C.

Samples P40 - 43, are 4 Km. Southeast of the Southeast end of One Eye Lake, (see Map III/IV). They are from freshly exposed outcrops on both sides of highway # 20.

- P40 - Lava Rock (Andesite (?)); light bright green; similar to P43, but brecciated; angular crystal fragments, 1/2 mm. - 2 cm. in size. A result of pressure ?; the rock fractures into rounded uneven chunks; calcite veins and calcite crystals.
- P41 - Same as above.
- P42 - Same as above.
- P43 - Lava Rock (Andesite (?)); beet red; very fine grained, uniform, massive and heavy, but repeatedly cut (every 2 cm., by roughly parallel sheets of calcite - deposited in their hairline to 1/2 cm. wide fractures.) The rock fractures into angular, elongated blocks.

Samples P50 - 51, are from the north shore of One Eye Lake, at its north west end. (See Map IV.) The outcrops were studied to verify and compare the described and expected geology of the lava plateau as reported in the literature. Very little outcroppings are to be found here, although ridges are parallel with those south of the lake, in the areas of Samples K50-55. These ridges however, (north of One Eye), are not as steep, or sharp - i.e.: not like buttes.

- P50 - Lava Rock (Andesite (?)); gray to light gray, weathering to black and rusty brown, fine grained, with phenocrysts, (feldspars(?)), up to 80%, 1/2 mm. - 1 cm.; porous micro holes, some with black - up to 0.1 mm.; very magnetic.

A sand sample, as requested by the geologist for industrial minerals from the Ministry, who asked that when clean sand is found that samples should be taken.

- P51 - Very fine grained; 80 % beigey, 10 % gray, 10% black.

SAMPLE AREA K:

Samples K1 - 3, are from an outcropping peak, on the alpine plateau, near its eastern, north end. (See map III/V.) From the rolling plateau the outcrop gradually rises approximately 200 meters. The outcrop is about 200 meters long on top, the rock face breaking in angular fragments. Strike is the usual NNE, and dip is about 60° to the NW. SEE SKETCH #2

- K1 - Hornfels; (see 50A); non -magnetic; less rust, waxy, slickenside.
- K2 - Hornfels; as above.
- K3 - A. Quartzite - Chert (?); light gray; aphanitic; contacting with hornfels; non magnetic.
  - B. Hornfels; angular fragments of A in it; 2 - 4 mm., non magnetic.
  - C. Silicified Hornfels; vuggy, phenocrysts of feldspar (?), non -magnetic.

Samples K10 - 15, are from an obvious contact zone, on the edge of a great cliff - visible for miles, even from Kleena Kleene and Highway #20. (See Map III/V.) The cliff top is approximately 2.5 km. north (magnetic) from Samples K1 - 3. The cliff face is about 1000 meters high, facing north. Approach is possible, only from the south. The samples represent a cross section of the cliff top, from east to west. Their is minor banding on the east end of the cliff, which gets bigger and more frequent to the west. The rock changes from hornfels in the east to diorite in the west. The banding being quartzitic and aphanitic between the hornfels, ranging in width from a mm. to 2 meters in the middle (sample K11.) Looking at the cliff face from the north through binoculars one can see signs of twisting and folding of the bands - but this is not visible on top of the cliff itself. The apparent strike, as measured from the cliff top, is as usual NNE, and dip 70° to the NE. (An unanswered question remains, 'was there altered slate like rock, at the far east end of the cliff face'? - similar to that found near KK? Due to the overhang of the cliff a sample was not obtained - and without climbing gear would be impossible.) SEE SKETCH #2, AND SKETCH #3.

- K10 - Hornfels; (see K50A); contact with light grey Quartzite - Chert (?); can see quartzitic banding, 1 mm - 3 cm.
- K11 - A. Hornfels; non magnetic;
  - B. Quartzite - Chert (?);
  - C. Hornfels; non magnetic;
- K12 - A. Hornfels; non magnetic;
  - B. Diorite; vein(?), contacting with hornfels; sharp dark silicified; non magnetic;
  - C. silicified Tuff (?); looks like sandstone(?), micro crystalline; non magnetic.
- K13 - Diorite; white, coarse;
- K14 - Very Good Examples of the sharp contact found at the cliff face. Bands of Hornfels and Quartzite - Chert (?), grading to Diorite. Bands are from 1 mm. to 2 meters wide (thickest in the centre.) Contacts are sharp. THIN SECTION.
- K15 - A. Diorite; cream, gray, white; some weathering to pink.
  - B. Diorite. Notice that at this end of the cross section; west, there are no more contacts, nor any sign of hornfels. Therefore we have crossed the contact to the pluton side.

SKETCH #2

SKETCH #3

Sample K20 is from an angular boulder, found on a ridge between one of the many creeks falling from the mountain - topped by the great cliff of samples K10 - 15 to the SW. (See Map V.) Although possibly a boulder, this could also be an outcrop, but due to the thick bush verification was not possible. This sample is approximately 3.5 km. NW of sample P28.

- K20 - Hornfels; similar to K50A, but no quartz veins; rusty weathering; slightly magnetic.

Samples K50 - 52, are from a butte shaped outcrop, right on the contact, and in one of the most interesting, and hardest to access areas, of the prospect area. (See Map V.) The butte's face breaks off to the west, and north. To the east it gradually falls to meet the rising ground. (An extension of this ridge, with a dip or break in its top, continues to form the next ridge on trend, the ridge of Sample K53.) The outcropping rock rises about 50 - 70 meters vertically, with a vertical rise of about 20 - 30 meters of the scree slope before it. The face of the rock is almost 1000 meters long, on trend with all the other ridges and buttes, even the one north of Lone Swan Lake. Strike is NNE. Alteration is greatest towards the west end. The actual contact, and fault zone of the area, is covered by a muskeg and a lake - surrounded by windfall. A Moss sample was taken, as it was the only possible sample type possible, about 1000 meters to the south east of the butte. (This was an extremely interesting valley, although grown over, as just to the south east, about 400 meters away was an outcrop of diorite, (samples G1, and G2.) Samples K50 - 52 represent a cross section from west to east of the cliff face. There were many green tinged rocks, and vesicular rocks with quartz infillings. SEE SKETCH #4.

- K50
  - A. Hornfels; dark green, hard with disseminated very fine pyrites (?); magnetic, foliated with white quartz veins. Breaks into sharp, angular pieces.
  - B. Quartzite - Chert (?) Breccia; gray, locally grading to greenish grey, within Hornfels.
  - C. Volcanic Tuff; bright green, grading to greyish; finely grained, with scattered brown rusty spots, (1 - 2 mm.)
  - D. Quartzite - Chert (?); dirty cream, light green; cryptocrystalline, fragmented (fractured?), and porous (due to leaching?); grading to Quartz Breccia (?), locally chloritic - green.

- K51
  - A. Hornfels; (see K50 - A); no Quartz veins, pyrites not visible to the naked eye, waxy, slickenside surfaces; very slightly magnetic.
  - B. Volcanic Tuff; cream coloured; very finely grained; grading to silicified rock (see K50 - D), chloritic.
- K52
  - A. Hornfels; (see K50A); banded with bright chloritic green quartzite veins. Veins have vuggy (leached (?)) porosity, and contain scattered sub angular fragments of gray hornfels rock within them.
  - B. Quartzite - Chert (?); white, green gray to gray; possibly silicified volcanic tuff; very fine grained to cryptocrystalline. Sharp contact - in one sample the rust is concealed.
  - C. Diorite; white feldspar - mainly orthoclase, average 1 - 2 mm., euhedral in 15% dark gray matrix (of hornblende, etc.)

SKETCH #4

Sample K53, is from another outcropping butte, more tree, bush and windfall covered however, and approximately 500 meters ESE from sample K52. (See Map V.) In between is a small valley, or break, bush covered, where some geological changes must take place. In general these two ridges, and those to the ESE, rise to the east in elevation. The outcropping rock of K53 is all very dark red in colour.

- K53 - Diorite; dark brick red, all weathered; orthoclase and plagioclase feldspar, average 2 mm., about 85%. A few fragments of hornfels (?), average diameter 1 cm. within diorite.

Sample K54 is from another windfall covered ridge, on trend to the ESE, approximately 1000 meters from Sample K53. (See Map V.) 500 meters on the way from K53, is a valley/gorge, made by stream S1, from which a stream sediment sample was taken. The ridge itself continues to the ESE with a dip in it, and 500 meters away is sample K55.

K54 - A. Silicified Conglomerate (?) - (Quartzite - Chert (?)); dark gray to reddish; fragments angular to rounded, irregular, 1 - 30 mm.; 15% dark gray (magnetic), hornfels fragments, 5% quartz pebbles, 20% gray rock.
- B. contact with reddish Diorite; (See K53).

500 meters ESE, and on trend, on another ridge, from sample K53. The trend continues to the outcropping ridge, approximately 2.5 km. to the ESE of samples P30 - 32.

- K55 - Hornfels; similar to K50A; dark gray , non magnetic, fractured, fissures up to 2 mm. wide filled with dark green gray crystals - minerals(?). THIN SECTION.

Samples G1 - 2, are from a ridge, forming a parallel line to the ridges of samples K50 - 52, K53, K54, etc.; but this ridge line is more to the south, about 500 meters. This ridge does not continue on trend to the ESE however, as there is a minor fault, and it ends. Otherwise the ridge itself is similar in size and shape, of a completely different rock.

- G1 - Diorite; Same as G2.
- G2 - Diorite; creamy white; coarse grained, 2 - 3 mm. average.

SAMPLE AREA KK:

Sample KK40 is from the north westerly end of the prospect area. (See Map V.) It as above the Klinaklini River valley which is to the south. Approximately 6.5 km. NW. of Camp # 2. In an area over grown with trees, with very few outcrops, this was some country rock sticking out of the ground in short, angular broken ridges, a meter long and perhaps 1/2 - 1 meter high.

- KK40 - A. Lava rock (?); dark grey to black, very fine grained, vesicular, magnetic, plagioclase.
  - B. Lava rock (?) , same as above, lighter colored: grey, more phenocrysts - up to 80%, magnetic.
  - C. Same as above, lighter colored: light grey to beige.

Sample KK49 is a sand sample, 2 km. west of Camp #2. (See Map V.) The sand is very clean and pure, and covers an area of about 2 km.^{2}.

- KK49 - Sand, beige, 80% fine grained, 20% medium grained.

Samples KK50 - 55, are approximately 1.5 km. NNW of Camp#3. (See Map V.) The outcropping rock, forms a cliff face about 50 meters high, trending NW. The exposed rock face is about 100 meters long. A brecciated rock was found on the bottom of the cliff face, with a microcrystalline rock on top. A slate like rock weathering to sandstone in colour and texture was also found here - but not outcropping. Is it a float or from a boulder, or did it fall from the inaccessible cliff top ? (Its angular and fragile nature seems to indicate it is local.)

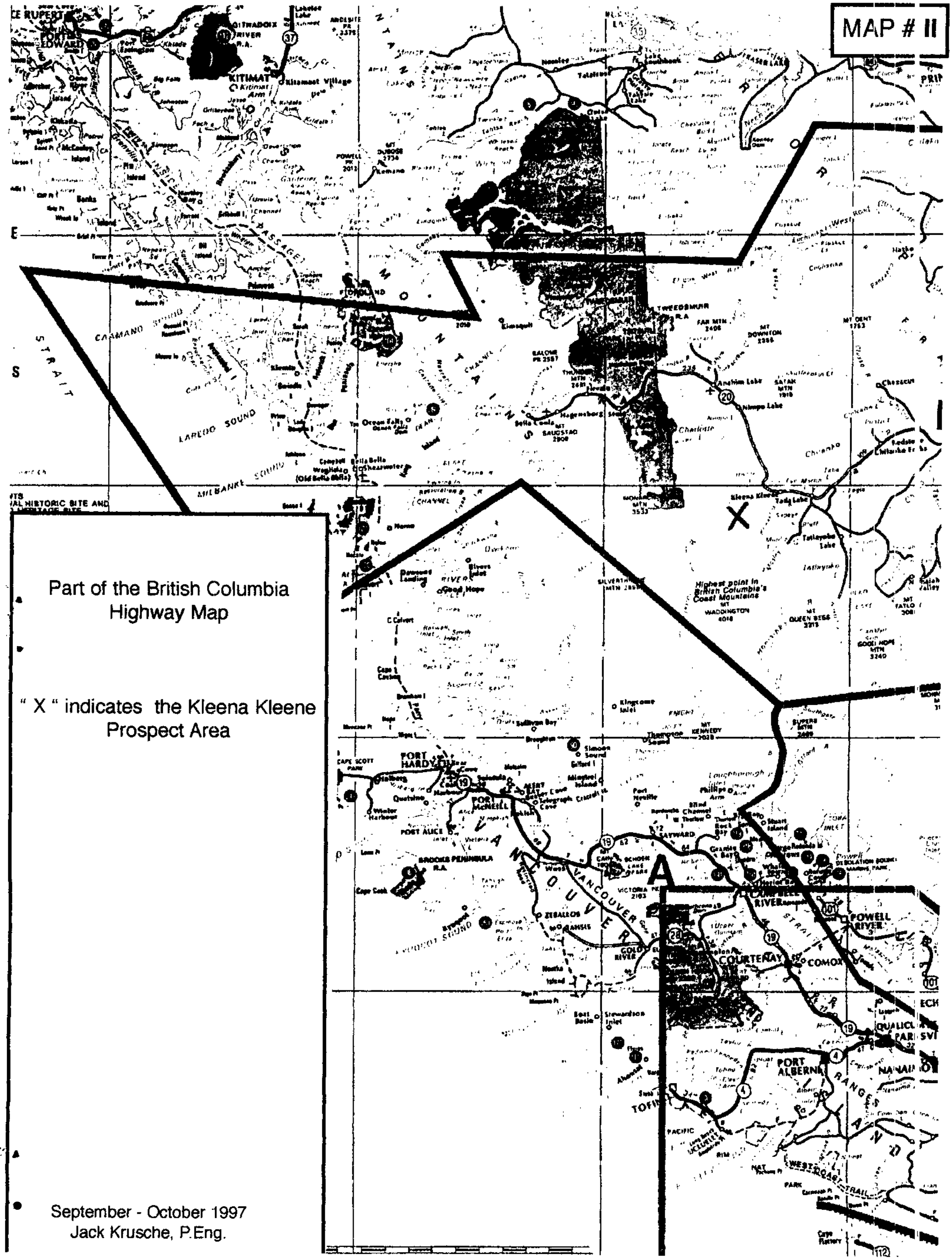
An interesting note: On the cliff face made of very hard rock, were long scratches across the face. Some scratches could be made from falling rock, however most of the scratches were horizontal. The scratches were 1/2 - 1 " in diameter, and gouged up to 1/2 " into the rock! They were straight and from 1 to 2 meters long. All were fresh looking. There were also old scratches visible. SEE PHOTO #8.

- KK50 - A. Hornfels, black, cryptocrystalline, not silicified, very shiny crystals, 2mm quartz vein; weathers to rusty color and grey, non magnetic
  - B. Conglomerate cement - (Tuff), grey, cryptocrystalline, angular, massive. SEE PHOTO #9.
  - C. Siltstone (?) - (Tuff) (?), grey to light grey, vesicular, feldspar (?) (5%, 1-2mm)
- KK51 - Slate, black, layered, 1-2mm, weathering to rusty brown or beige, broken rusty face shows colors of the spectrum. This is a textbook example of slate, where is it from? Contact hidden.

This sample KK55, was found next to Camp#3. (See Map V.) It seems to be similar to the rock found on top of the pinnacle SW. of Camp #3. This pinnacle , locally referred to as Finger Peak, is edged by layered lava flows at its bottom, turned on their side. The extrusive layers are flows of microcrystalline lavas and breccias alternating one on top of the other. The alternating lava flows extend for 1200 vertical meters, and above that is Finger Peak another 400 meters higher. The pinnacle itself is very green in colour. SEE PHOTO #10.

PHOTO #8

PHOTO #9



Part of the British Columbia Highway Map

" X " indicates the Kleena Kleene Prospect Area

September - October 1997
Jack Krusche, P.Eng.

02/26/98 15:18 GEOLOGICAL SURVEY BRANCH (BC) → KAMLOOPS NO.925 P005/010

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910 - 610 8TH AVE. S.W.
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T2P 1G5

Project :
Comments: ATTN: JACK KRUSCHE

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Invoice No. :19811222
P.O. Number :
Account :PKL

CERTIFICATE OF ANALYSIS A9811222

SAMPLE	PREP CODE		Au ppb FA+AA	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
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E10+	205	226	< 5	< 0.2	4.25	10	190	< 0.5	< 2	1.85	< 0.5	13	36	42	3.66	< 10	< 1	0.11	< 10	1.23	1030
K10+	205	226	< 5	< 0.2	4.36	4	140	< 0.5	< 2	2.54	< 0.5	9	50	45	1.96	< 10	1	0.36	< 10	0.81	320
K50+	205	226	< 5	< 0.2	3.62	6	60	< 0.5	< 2	3.31	< 0.5	7	67	46	2.73	< 10	< 1	0.06	< 10	0.65	635
P13+	205	226	< 5	< 0.2	0.96	6	40	< 0.5	< 2	0.62	< 0.5	4	168	22	1.03	< 10	< 1	0.09	< 10	0.30	188
P30+	205	226	< 5	< 0.2	2.66	2	100	< 0.5	< 2	0.63	< 0.5	10	45	16	2.84	< 10	< 1	0.21	< 10	0.67	640

CERTIFICATION: Ian H Bichler

PAGE.05 604 952 0381 FEB 26 1998 15:07 A

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SAMPLE	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
B1+	205	226	1	0.17	28	560	8	2	8	105	0.16	< 10	< 10	77	< 10	92
B10+	205	226	< 1	0.14	9	640	2	< 2	7	71	0.22	< 10	< 10	79	< 10	70
K10+	205	226	1	0.35	12	630	< 2	6	5	212	0.16	< 10	< 10	63	< 10	32
K50+	205	226	2	0.13	6	820	6	6	4	258	0.17	< 10	< 10	56	< 10	46
P13+	205	226	1	0.06	8	280	2	2	1	234	0.08	< 10	< 10	35	< 10	18
P30+	205	226	< 1	0.13	9	740	2	2	3	61	0.08	< 10	< 10	69	< 10	52

CERTIFICATION: Stewart Bichler

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S1	201	202	< 5	< 0.2	1.65	12	70	< 0.5	< 2	0.65	< 0.5	11	60	25	5.25	< 10	< 1	0.14	< 10	0.67	600
S2	201	202	20	< 0.2	2.07	28	140	< 0.5	< 2	0.68	< 0.5	34	33	34	6.66	< 10	< 1	0.17	10	0.73	4830
S3	201	202	< 5	< 0.2	1.31	10	130	< 0.5	< 2	0.96	< 0.5	10	27	15	3.59	< 10	< 1	0.14	< 10	0.56	3070
S4	201	202	< 5	< 0.2	1.36	18	60	< 0.5	< 2	0.59	< 0.5	11	88	25	6.53	< 10	1	0.17	< 10	0.58	395
S5	201	202	< 5	< 0.2	1.14	48	80	< 0.5	< 2	0.55	< 0.5	9	29	16	3.56	< 10	< 1	0.09	< 10	0.42	1140
S-01	201	202	< 5	< 0.2	0.87	12	50	< 0.5	< 2	0.47	< 0.5	11	115	19	7.39	< 10	< 1	0.10	< 10	0.36	305
S-02	201	202	< 5	< 0.2	0.80	18	50	< 0.5	< 2	0.34	< 0.5	8	31	19	2.95	< 10	< 1	0.11	< 10	0.37	275

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SAMPLE	PREP CODE	Mo ppm	Mn %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
#1	201 202	1	0.01	14	980	2	4	4	30	0.08	< 10	< 10	160	< 10	50
#2	201 202	4	0.01	14	1320	10	2	5	77	0.06	< 10	< 10	136	< 10	64
#3	201 202	< 1	0.06	10	1060	4	2	1	84	0.11	< 10	< 10	95	< 10	46
#4	201 202	< 1	0.02	17	780	2	2	3	44	0.12	< 10	< 10	224	< 10	48
#5	201 202	< 1	0.01	10	650	4	2	2	47	0.10	< 10	< 10	96	< 10	32
#-01	201 202	< 1	< 0.01	14	1290	< 2	< 2	1	16	0.10	< 10	< 10	274	< 10	34
#-02	201 202	1	0.01	10	1000	< 2	< 2	1	16	0.09	< 10	< 10	90	< 10	30

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604 952 0381 PAGE.08 FEB 26 1998 15:07

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Certificate Date: 02-FEB-98
Invoice No. :19811216
P.O. Number :
Account :PKL

CERTIFICATE OF ANALYSIS A9811216

SAMPLE	PREP CODE		Au ppb FA+AA	Ag ppm	Al %	As ppm	Ba ppm	Be ppm	Bi ppm	Ca %	Cd ppm	Co ppm	Cr ppm	Cu ppm	Fe %	Ga ppm	Hg ppm	K %	La ppm	Mg %	Mn ppm
810	201	202	< 5	0.2	1.05	< 2	60	< 0.5	< 2	2.11	< 0.5	3	13	45	1.07	< 10	1	0.22	10	0.27	260

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02/26/98 15:19 GEOLOGICAL SURVEY BRANCH (BC) → KAMLOOPS
604 952 0381 PAGE.09
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02/26/98 15:19 GEOLOGICAL SURVEY BRANCH (BC) → KAMLOOPS
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P.O. Number :
Account :PKL

CERTIFICATE OF ANALYSIS A9811216

SAMPLE	PREP CODE		Mo ppm	Na %	Ni ppm	P ppm	Pb ppm	Sb ppm	Sc ppm	Sr ppm	Ti %	Tl ppm	U ppm	V ppm	W ppm	Zn ppm
K10	201	202	5	< 0.01	7	1600	< 3	< 2	1	115	0.02	< 10	< 10	30	< 10	26

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ATTN: JACK KRUSCHE
WORKORDER : A9811222 PROJECT :

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PRELIMINARY DATA ONLY !!

*** Samples are being analyzed for: Au ppb FA+AA,Ag ppm,Al %,As ppm,Ba ppm,Be ppm,Bi ppm ,Ca %,Cd ppm,Co ppm,Cr ppm,Cu ppm,Fe %,Ga ppm,Hg ppm,K %,La ppm,Mg %,Mn ppm,Mo ppm,Na %, Ni ppm,P ppm,Pb ppm,Sb ppm,Sc ppm,Sr ppm,Ti %,Tl ppm,U ppm,V ppm,W ppm,Zn ppm

SAMPLE	983
DESCRIPTION	Au ppb
E1+	<5
E10+	<5
K10+	<5
K50+	<5
P13+	<5
P30+	<5

END OF DATA

Geological Survey Branch
MEI

JAN 30 1998

FROM : CHEMEX LABS LTD., VANCOUVER PHONE: 604-984-0221

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ATTENTION :
ATTN: JACK KRUSCHE
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PRELIMINARY DATA ONLY !!

*** Samples are being analyzed for: Au ppb FA+AA,Ag ppm,Al %,As ppm,Ba ppm,Be ppm,Bi ppm ,Ca %,Cd ppm,Co ppm,Cr ppm,Cu ppm,Fe %,Ca ppm,Hg ppm,K %,La ppm,Mg %,Mn ppm,Mo ppm,Na %, Ni ppm,P ppm,Pb ppm,Sb ppm,Sc ppm,Sr ppm,Ti %,Tl ppm,U ppm,V ppm,W ppm,Zn ppm

SAMPLE	983
DESCRIPTION	Au ppb
S1	<5
S2	20
S3	<5
S4	<5
S5	<5
S-01	<5
S-02	<5

END OF DATA

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PRELIMINARY DATA ONLY !!

*** Samples are being analyzed for: Au ppb FA+AA,Ag ppm,Al %,As ppm,Ba ppm,Be ppm,Bi ppm ,Ca %,Cd ppm,Co ppm,Cr ppm,Cu ppm,Fe %,Ga ppm,Hg ppm,K %,La ppm,Mg %,Mn ppm,Mo ppm,Na %, Ni ppm,P ppm,Pb ppm,Sb ppm,Sc ppm,Sr ppm,Ti %,Tl ppm,U ppm,V ppm,W ppm,Zn ppm

SAMPLE	983
DESCRIPTION	Au ppb
M10	<5

END OF DATA