1991 GEOLOGICAL AND GEOCHEMICAL REPORT

ON THE

GRANDUC PROPERTY

AUDRO 1(L6597), AUDRO 2 (L6596), BLEND 1 (L6614), BLEND 2 (L6613), GRANDUC 7 (L6588) J.P. 7 (15434), McK 6 (15038), McQ (L6591), McQ 1 (L6592), McQ 2 (L6589), McQ 3 (L6590), QUEEN 24 (15540), VK 1 (L6619), VK 2 (L6618), VK 3 (L6620), BOB 3 (19703), BOB 5 (19705), BOB 6 (19706), KEY 12 (21665), KEY 14 (21667), KEY 43 (21696), KEY 45 (21698), KEY 135 (31604), VAUGHN K5 (L6568), VAUGHN K-6 (L6569), VAUGHN K7 (L6576), VAUGHN K8 (L6575)

SKEENA MINING DIVISION

104B/1E, 1W, 8W

Latitude: 56°14'

Longitude: 130°20'

Owner and Operator:
Granduc Mines Ltd. (N.P.L.)
2500 - 595 Burrard Street
Vancouver, B.C.
V7X 1L1

Consultants:
Cambria Geological Ltd.
1531 West Pender Street
Vancouver, B.C.
V6G 2T1

By:
W. Melnyk, P.Eng.
Cambria Geological Ltd.

CGL 91-1

October, 1991

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SUMMARY

The Granduc property is located 25 miles northwest of Stewart, B.C., on the south slope of Granduc Mountain.

The Granduc deposit contained 32 million tons grading 1.83% copper with minor zinc and gold. During the years of production, from 1968 to 1984, approximately half of the original reserves were extracted. Low copper prices in the early 1980's forced mine closure. Exploration drilling has outlined a mineral reserve of 17.4 million tons of 1.85% copper.

Granduc mineralization is hosted in Upper Triassic metavolcanic and sedimentary rocks correlative to the Stuhini Group rocks. The deposit is similar in geology, metallurgy, and grade to the Lokken deposit in Norway and also shares similarities with Besshi type deposits.

The 1991 Granduc exploration program consisted of geochemical soil and rock sampling, geological mapping, and prospecting. Granduc VMS mineralization was geochemically characterized and determined to possess an anomalous Cu, Mo, Ba, Pb, Zn signature.

Granduc mine series rocks were examined along strike to the South Granduc Zone and north beyond the Granduc Fault. Massive sulphide boulders, geochemically anomalous in Cu, Pb, Zn, Au, and Ag were discovered in float near the North Leduc Glacier in an area underlain by felsic, cherty mine series rocks.

Geological mapping near the South Granduc Zone identified mineralized quartz-carbonate-sulphide veins which assay up to 0.154 oz/t Au over narrow widths. Abundant, well mineralized, float boulders occur nearby.

The Tide Portal area is underlain by altered and sheared granodiorite. During production exploration, sampling resulted in assays up to 2.44 oz/t Au over narrow widths. Limited surface sampling in 1991 failed to achieve significant gold grades.

The Blend 2 Show is a vein-type mineral occurrence and contains abundant chalcopyrite-magnetite-molybdenite mineralization. The mineralization is hosted by the HFK fault which is also host to several other mineral occurrences in the Granduc Bob area.

Zones of quartz-carbonate alteration were examined in the AJAX 4 and TIDE TUNNEL (KEY 43 claim) areas. Geochemical sampling failed to detect significant base and precious-metal mineralization.

A narrow band of felsic rocks, correlative with mine series rock, was examined in the Dacite Zone. Sampling did not detect any significant base or precious-metal mineralization.

RECOMMENDATIONS

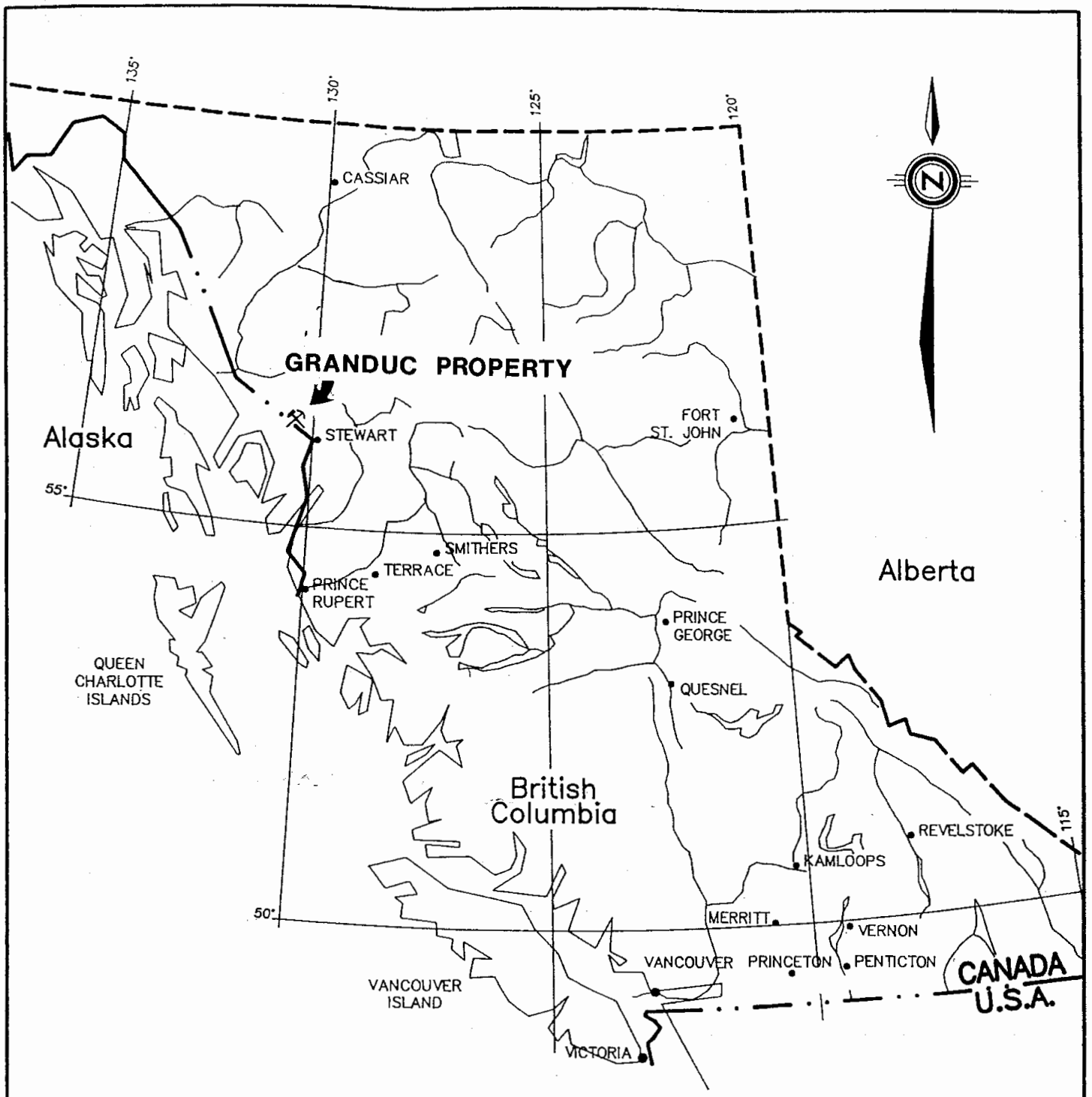
1. Re-assess and compile all historic surface and mine data with the objective of directing future exploration activities toward discovering economic concentrations of polymetallic mineralization.

2. Relog available drill core and analyze select samples using multielement geochemistry focusing attention on the monzonite sills, known to contain gold, tungsten, and molybdenum.

3. Re-map the property and adjacent geology and correlate Granduc stratigraphy with surrounding Upper Triassic and Lower to Middle Jurassic stratigraphy.

4. Assess the gold bearing shears and veins previously discovered underground near the Tide Portal.

5. Determine the source of polymetallic massive sulphide boulders discovered on the north slope of Granduc Mountain.



GRANDUC MINES LTD. (N.P.L.)		
Report by: WDM	GRANDUC LOCATION MAP	
Date: Oct, 1991		
NTS: 104 B/1		
Mining Division Skeena		Fig. 1

A. INTRODUCTION

A.1 Program Objectives

The objectives of the 1991 Granduc exploration program were to evaluate the exploration potential of the property and to establish a datum upon which future exploration activities could be based. Several known mineralized areas and geologically permissive zones were geochemically sampled and geologically re-assessed. The exploration costs will be applied toward claim assessment credits and will result in extending the expiry dates, of all work-assessable claims, two years.

A.2 Location and Access

The Granduc property is located in northwestern British Columbia 900 km northwest of Vancouver, 40 km northwest of Stewart, and near the southern extremity of the Alaska Panhandle (Fig. 1).

The property is located in the Skeena Mining Division at longitude: 130°20', and latitude: 56°14'. The mine workings are located on the south side of Granduc Mountain which is surrounded by the North and South Leduc Glaciers. The mine workings are accessed by an 19.5 km tunnel, collared near Summit Lake, 35 km north of Stewart.

The mill facilities, which have since been demolished, were located at Tide Lake and accessed by an all-weather road from Stewart-Hyder. Stewart possesses port facilities for ocean going vessels, and a paved air-strip capable of handling medium-sized aircraft.

GRANDUC PROPERTY BOLD OUTLINE

GRANDUC MINES LTD.(N.P.L.)

GRANDUC PROPERTY

SKEENA MINING DIVISION

104B 1, B 2, B 8

Oct, 1991	1:50,000	Fig. 2

QUEEN GROUP SHADED

GRANDUC PROPERTY BOLD OUTLINE

GRANDUC MINES LTD.(N.P.L.)

GRANDUC PROPERTY

SKEENA MINING DIVISION

104B 1, B 2, B 8

QUEEN GROUP

Oct, 1991	1:50,000	Fig. 2a

QUEEN-SUP GROUP SHADED

GRANDUC PROPERTY BOLD OUTLINE

GRANDUC MINES LTD.(N.P.L.)

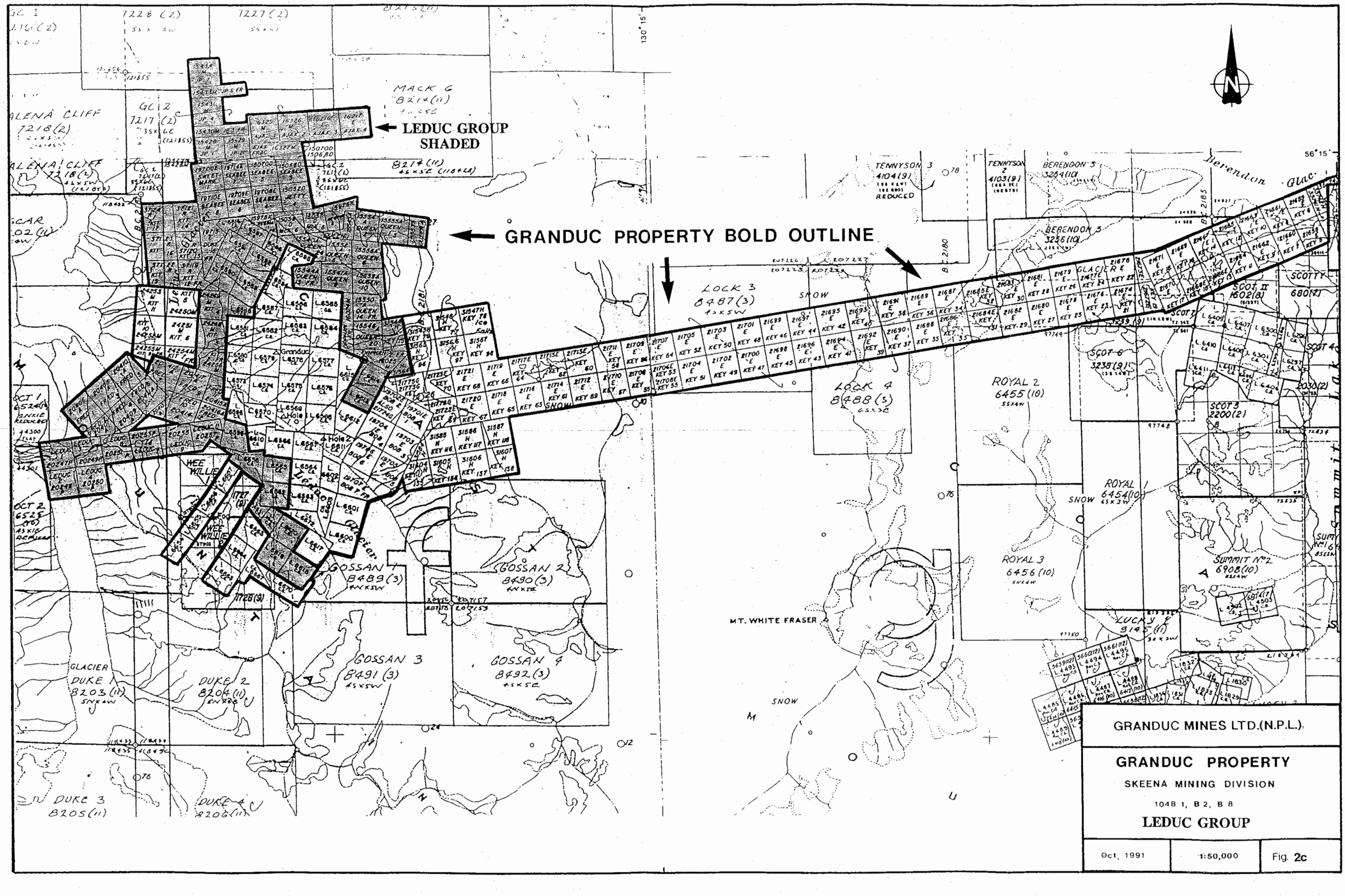
GRANDUC PROPERTY

SKEENA MINING DIVISION

104B 1, B 2, B 8

QUEEN-SUP GROUP

Oct, 1991	1:50,000	Fig. 2b


LEDUC GROUP SHADED
GRANDUC PROPERTY BOLD OUTLINE
GRANDUC MINES LTD.(N.P.L.)
GRANDUC PROPERTY
SKEENA MINING DIVISION
104B 1, B 2, B 8
LEDUC GROUP
Oct, 1991
1:50,000
Fig. 2c

GRANDUC PROPERTY BOLD OUTLINE

KEY GROUP SHADED

GRANDUC MINES LTD.(N.P.L.)

GRANDUC PROPERTY

SKEENA MINING DIVISION

104B 1, B 2, B 8

KEY GROUP

Oct, 1991	1:50,000	Fig. 2d

A.3 Land Status

The Granduc Property consists of 64 Crown Granted mineral claims and 169 two-post mineral claims (Fig. 2). A list of claims and crown grants with their respective record numbers and expiry dates is attached as Appendix A. All claims constituting the Granduc property are owned by Granduc Mines Ltd. (N.P.L.), 2500 -595 Burrard Street, Vancouver, B.C. V7X 1L1. The 1991 exploration expenditures have generated sufficient work credits to advance the expiry dates of all work assessable claims to 1994 as shown in Appendix A.

Claims comprising the Granduc Property have been variously grouped into four groups for purposed of applying assessment credits. Figures 2a to 2d illustrate the group configurations and attached lists identify contained claims.

A.4 History

The first recorded discovery of mineralization on Granduc Mountain was by Wendell Dawson and W. Fromholz in 1931. The copper showings at Granduc Mountain were staked in 1951 by E. Kvale and T.J. McQuillan for Helicopter Exploration Co. Ltd. Granby Mining Co. examined the claims in 1952, formed a new company, Granduc Mines Ltd., and started the surface and underground exploration work. Newmont Mining Corp. Ltd. gained an interest in the property in 1953 and entered into an agreement with Granby whereby Newmont would aid in financing the development of the mine.

130°15'

JP 7 CLAIM AREA

GRANDUC PROPERTY OUTLINE

AJAX AREA

GRANDUC McQ

TIDE TUNNEL AREA

TIDE PORTAL AREA

GLORY HOLE AREA

GRANDUC BOB

GRANDUC MINE

SUMMIT LAKE

DACITE AREA

SOUTH GRANDUC ZONE

0 1000 2000 3000 4000m

Metres

GRANDUC MINES LTD.(N.P.L.)

GRANDUC PROPERTY

AREAS EXAMINED
IN 1991 PROPERTY EVALUATION

Aug.,1991	1:50,000	Fig. 3

Exploration and development of the mine led to the first production in 1968. Approximately 17 million short tons of copper ore grading 1.83% copper were mined between 1968 and 1984 by the Granduc Operating Company and later by Canada Wide Mines Ltd. Low copper prices plagued the mining enterprise during the Canada Wide Mines operating years and resulted in the closure of the mine and demolition of all mill facilities in 1985.

Exploration activity on the Granduc property was primarily focused on the mine area copper mineralization. In the final years of operation, Esso Minerals Canada conducted exploration programs to test the gold potential of the property. Gold bearing quartz-carbonate vein mineralization was discovered in the Tide Tunnel and intrusive related gold mineralization was located in the mine area.

A.5 1991 Exploration Activities

The 1991 Granduc exploration program consisted of contour soil and rock assay sampling in the vicinity of the Granduc Glory Hole and similar sampling, prospecting, and geological mapping in areas along strike underlain by mine series rocks. Several other areas were also geologically examined and sampled. The various areas evaluated are shown in Fig. 3 and include; Granduc Glory Hole, South Granduc Zone, Granduc McQ, Blend 2 Show, JP-7 Claim, Granduc Bob, Tide Tunnel (key 43 claim), Tide Portal Area, AJAX 4 Zone, and Dacite Area. All field work was done by 3 senior consulting geologists conducting solo traverses.

A total of 118 soil samples were collected from the "B" and "C" horizons at depths of 10 to 15 cm with a rock-pick. Soil samples were placed in Kraft paper bags and appropriately identified. A total of 13 sediment samples were collected from streams on Granduc Mountain. Samples were placed in Kraft paper bags, identified and air dried prior to shipment for analysis.

A total of 165 rock samples were collected representing either composite chips over "X" feet, or representative float samples. Rock and sediment sample descriptions are attached as Appendix B.

Rock, soil, and sediment samples were analyzed using a standard 24 element ICP geochemical analysis, plus gold fire assay. All analytical data is attached as Appendix C. All samples were analyzed at Chemex Labs Ltd., 212 Brooksbank Avenue, North Vancouver, B.C. V7J 2C1. Chemex analytical methods are attached as Appendix D.

B. GEOLOGY OF THE STEWART-ISKUT BELT

B.1 Jurassic Calc-Alkaline Volcanic Arc Assemblages

The major focus of precious and base metal exploration programs in the Stewart-Iskut Belt is on island arc rocks of Jurassic age. The Jurassic rocks are part of the Triassic-Jurassic age Stikinia, which formed as an independent arc terrane, separated from the North American craton. Table 1 shows the major rock formations of the Stewart-Iskut Belt.

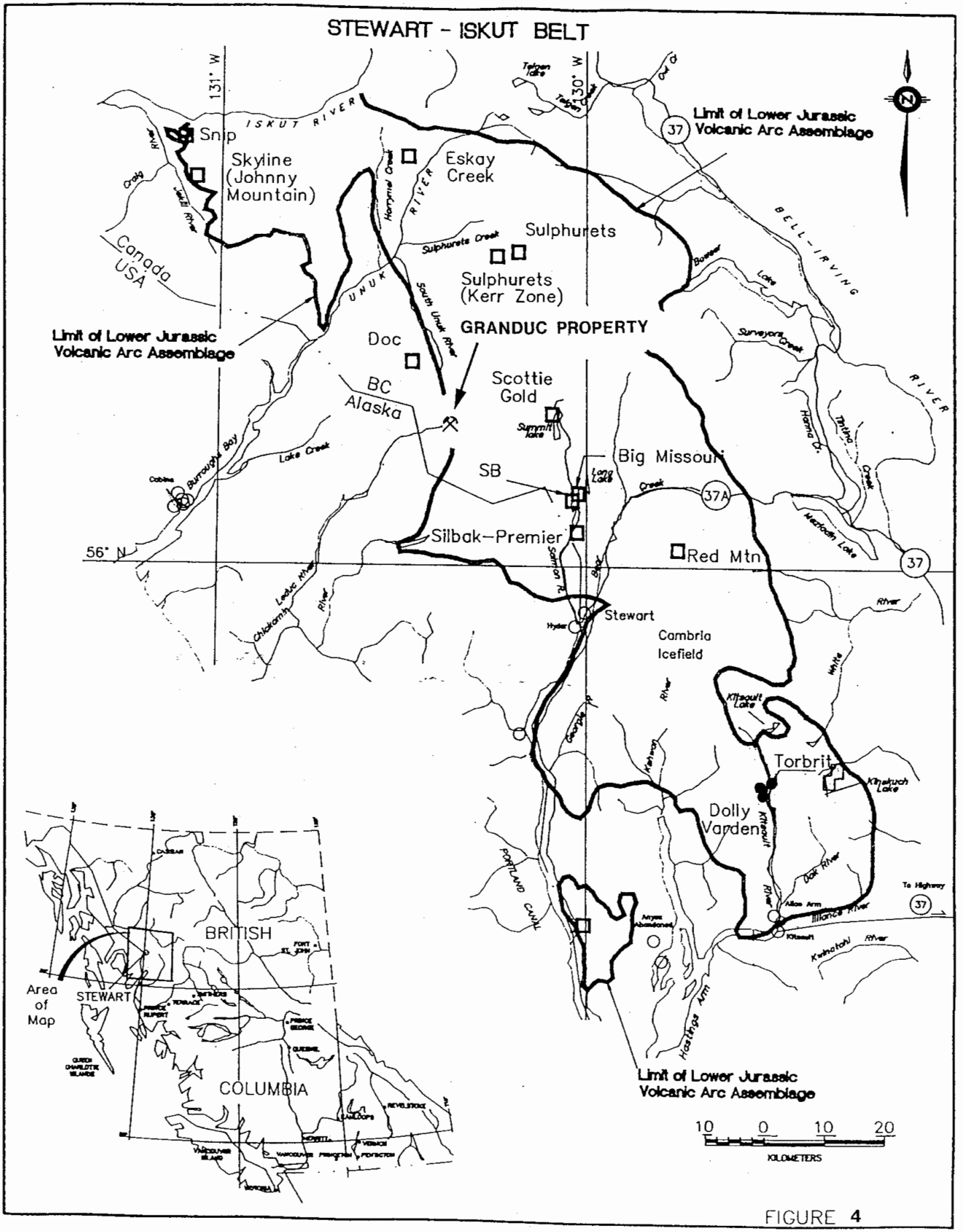

STEWART - ISKUT BELT
131° W
130° W
56° N
ISKUT RIVER
Snip
Skyline
(Johnny
Mountain)
Eskay
Creek
Sulphurets
Sulphurets
(Kerr Zone)
Canada
USA
Limit of Lower Jurassic
Volcanic Arc Assemblage
GRANDUC PROPERTY
Doc
BC
Alaska
Scottie
Gold
Big Missouri
SB
Silbak–Premier
Red Mtn
Stewart
Cambria
Icefield
Torbrit
Dolly
Varden
Limit of Lower Jurassic
Volcanic Arc Assemblage
37
37A
BELL–IRVING
RIVER
Area
of
Map
BRITISH
COLUMBIA
STEWART
10 0 10 20
KILOMETERS

FIGURE 4

TABLE 1

MAJOR VOLCANIC AND SEDIMENTARY FORMATIONS OF THE STEWART-ISKUT BELT

AGE		GROUPS	FORMATIONS	LITHOLOGIES
Middle Jurassic	Bathonian	Bowser Lake	Ashman	Turbidites, wackes, intra formational conglomerates, basal chert pebble conglomerates.
Middle to Lower Jurassic	Bajocian to Toarcian	Spatsizi (?)	Salmon River	Pyjama beds: thinly bedded, alternating siltstone and argillite. Basal fossiliferous limestone or fossiliferous wacke. Locally contains pillowed basalt flows.
Lower Jurassic	Toarcian	Not Named (Formerly Hazelton)	Mt. Dilworth	Dacitic ash and lapilli tuff, some welded ash Flow.
			Betty Creek	Hematitic volcanic sediments, turbidites; Dacitic and andesitic tuffs, lapilli tuffs and flows. Rests unconformably on Hazelton Group rocks.
Lower Jurassic	Pliensbachian to Sinemurian or Hettangian (?)	Hazelton	Unuk River	Two feldspar and hornblende porphyritic tuffs and flows. Massive tuffs and lapilli tuffs with local volcanic sediments. Locally intercalated with turbidites and minor limestones.
Upper Triassic	Norian to Karnian	Stuhini		Pyroxene porphyry flows and tuffs. Turbidites, limestone and conglomerate.

Upper Triassic Stuhini Group rocks form the base of the island arc terrane. Lower Jurassic Hazelton Group consists mostly of large volumes of calc-alkaline volcanics of the Unuk River Fm., and their coeval alkaline and calc-alkaline intrusions. The base of the Hazelton Group is Sinemurian age or locally as old as Hettangian.

Pliensbachian time was marked by a hiatus in volcanism over most of Stikinia and the start of back-arc rifting. Betty Creek Fm. was deposited in late Pliensbachian to Toarcian time. The Betty Creek Fm. rocks were deposited in irregularity distributed basins that were linear and structurally-controlled. Stratigraphic thicknesses vary markedly over short distances. Mt. Dilworth Fm. was deposited in Toarcian time and consists of distinctive pyritic felsic volcanics. Locally, the Mt. Dilworth Fm. rocks may interfinger with Betty Creek Fm.

Spatsizi Group rocks were deposited in a Toarcian to Bajocian age back-arc basin. The basin was probably the precursor of the Bowser Basin. In the Stewart-Iskut belt area, the Salmon River Fm. formed in Toarcian time. The basal unit is a distinctive fossiliferous and pyritic wacke. The basal wacke of the Salmon River Fm. rests on an erosional unconformity in much of the Stewart-Iskut belt, although locally it appears conformable to Mt. Dilworth Fm.

B.2 Lithologies

B.2.a Upper Triassic Stuhini Group

Anderson, 1989, defined western and eastern facies of the Upper Triassic Stuhini Group. In the western facies, sedimentary rocks underlie a bimodal volcanic suite. Eastern facies sedimentary rocks interfinger with intermediate and mafic volcanic rocks but are more common at the top of the succession.

Western facies rocks consist of coralline limestone and polymict conglomerate. Chert, limestone, greywacke, and shale fragments dominate. Breccia, felsic tuff, shale, and micrite overlie the limestone and conglomerate. Conodonts in the limy rocks are Late Triassic (Carnian or Norian) in age. Aphyric felsic tuff interfingers with siliceous and limy shale of the lower sedimentary member. Towards the top, laminated mafic and white felsic tuffs are common. Coarse pyroxene phenocrysts characterize mafic and felsic flows.

Eastern facies Stuhini Group rocks lack the thick lower limestone and felsic volcanic rocks of the western facies. Grey and brown feldspathic, locally calcareous greywacke and siltstone are distinctive. Polymict pebble to boulder conglomerate, shale, and rare thin coralline and crinoidal limestone are

subordinate. Conglomerate and breccia fragments include: common aphyric to hornblende - or clinopyroxene - phyric andesite and basalt; lesser grey to black chert and brown feldspathic greywacke; uncommon grey limestone; and rare felsic volcanic fragments.

Volcanic rocks are generally intermediate or mafic. Dark green hornblende - or clinopyroxene - phyric andesitic and basaltic volcanic conglomerate and breccia are typical.

B.2.b Lower Jurassic Hazelton Group Unuk River Formation

Rocks of the Unuk River Formation are assigned to the Hazelton Group. White and greyish-brown, locally deformed, andesitic volcanic breccia, thin-bedded hydroclastic and lava dominate Unuk River Formation. Aphyric, plagioclase - and chloritized hornblende-phyric andesitic fragments are characteristic. Rare serpentinized olivine basalt occurs within the volcaniclastics.

West of the Bowser River, the volcaniclastics grade into a variegated sedimentary unit, waxy, rusty or white weathering, thin-bedded, wispy-laminated siliceous siltstone dominates the unit; black weathered pebble conglomerate and greywacke are subordinate.

B.2.c (Formerly Hazelton Group) Betty Creek Formation

Betty Creek Formation contains maroon to green volcanic siltstone, greywacke, conglomerate, breccia, and rare lava with common sedimentary structures and anastomosing ferruginous or jasperoid veins. It overlies the Unuk River Formation conformably; locally the contact is gradational. The epiclastic nature, maroon colour and abundant ferruginous veining distinguish Betty Creek Formation. Its members are massive, thick or medium-bedded. Poorly sorted, pebble to boulder volcanic conglomerate and breccia contain matrix-supported grey, green, and purple aphanitic and ($\pm$ hornblende-) plagioclase-phyric andesite fragments. Finer grained rocks appear to be reworked crystal and/or lithic tuffs.

B.2.d Mount Dilworth Formation

Mount Dilworth Formation is the least heterogeneous and most extensive marker unit within the Stewart-Iskut Belt. Its white, maroon, or green weathering, felsic tuff, tuff breccia and dust tuff are welded and non-welded and aphyric to sparingly plagioclase-phyric. Eutaxitic and spherulitic textures, flow layering and dacite to rhyolite composition distinguish it from locally similar Betty Creek Formation. Auto breccia is common. The widespread distribution and relatively consistent thickness of Mount Dilworth Formation suggest that topographic relief was low during eruption of the ignimbrite and felsic lava.

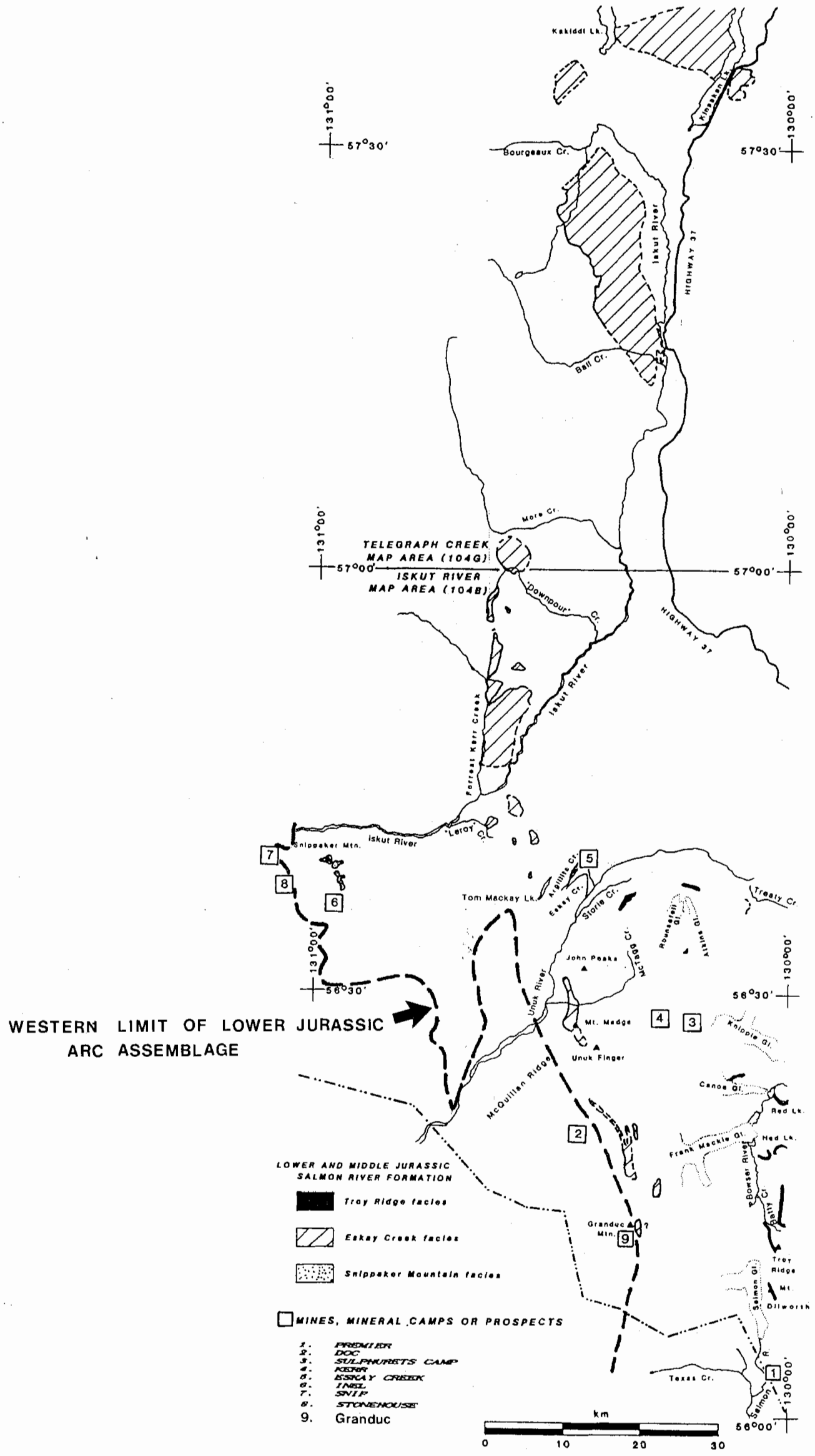


Figure 5 Index map for localities mentioned in text and distribution of Troy Ridge, Eskay Creek and Snippaker Mountain facies of Lower and Middle Jurassic Salmon River Formation.

(After RG Anderson and D J Thorkelson, 1990)

B.2.e Lower and Middle Jurassic Spatsizi Group Salmon River Formation

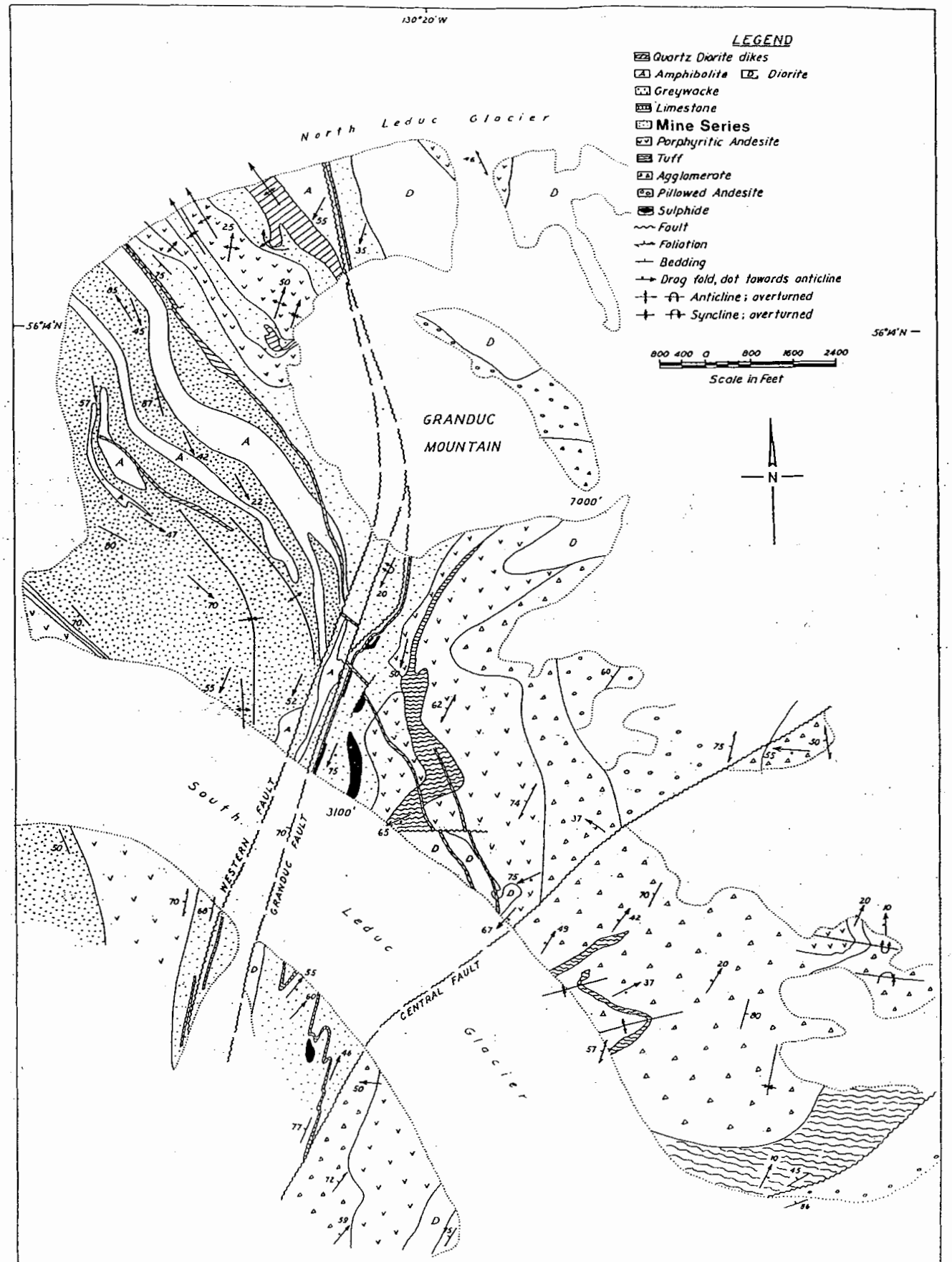
The Salmon River Formation comprises two members. A thin, belemnoid-rich, upper Lower Jurassic calcareous sandstone occurs at the base. The overlying lower Middle Jurassic member has three facies that form north-trending belts (Fig. 5). The Troy Ridge facies, informally known as the "pajama beds" is a distinctive black siliceous, radiolarian-bearing shale and white reworked tuft turbidite that occurs in the east. Along the west of the Unuk River is a sequence of pillowed lava and limy to siliceous shale and siltstone of the Eskay Creek facies. This medial facies hosts the Eskay Creek prospect. The westernmost Snippaker Mountain facies consists of andesite volcaniclastics.

B.2.f Middle and Upper Jurassic Bowser Lake Group

Rocks of the Bowser Lake Group consist of basal greywackes, shale turbidites, chert-pebble conglomerate, and grade up section to pencil shale and siltstone. The contact between Salmon River Formation and overlying Bowser Lake Group is gradational.

C. GRANDUC GEOLOGY

The bedded rocks in the Granduc Mine area are correlated with the Upper Triassic volcanic-sedimentary sequence of the Stuhini Group and consist of basal andesite flows and pyroclastics, overlain by chemical sedimentary rocks, volcaniclastics, and epiclastic rocks (McGuigan and Tucker 1981). This stratigraphic sequence strikes roughly north-south and is divisible into four



GEOLOGY AND STRUCTURE OF GRANDUC MOUNTAIN

SULPHIDE BODIES SHOWN IN DIAGRAMMATIC PROJECTION

Fig. 6

mappable units. Intrusive rocks consist of late Triassic and Jurassic deformed and foliated granodiorite, diorite, and unfoliated cretaceous to Eocene granodiorite and quartz diorite.

Rocks in the Mine area have been divided into six broad assemblages (McGuigan, 1980). Beginning with the lowermost rock group, these are:

1) Lower Footwall Series: Andesite-Basalt flows and flow breccias
2) Upper Footwall Series: Andesite pyroclastics
3) Mine Series: cherty and limy fine-grained sediments, conglomerate
4) Hanging Wall Series: Andesitic tuffs, Greywackes
5) Hanging Wall Series: Greywackes
6) Plutonic rocks and associated dikes and sills

C.1 Lithologies

C.1.a Lower Footwall Series

This unit consists of pillowed andesites of basalt-andesite composition. These rocks grade upward into agglomeratic, andesitic fragmental flows which are in turn overlain by augite phyric andesite flows. These rocks are undeformed but are locally offset by the Central, HFK, and Scottie Dog Faults.

C.1.b Upper Footwall Series

This unit consists of 1500 feet of intercalated andesitic and dacitic tuffs. The dacitic tuffs are mineralized with chalcopyrite-pyrite in the lower dacite tuff and chalcopyrite-magnetite in the upper two dacite members.

C.1.c Mine Series

Mapping by Esso Minerals geologists in the early 1980's identified the mine series stratigraphy as consisting of cherts, fine grained siliceous siltstones, argillites, and tuffaceous rocks with an upper limestone member.

The Mine Series stratigraphy was subdivided into the following map units:

Granduc limestone

Upper tuff

"A" ore zone

Upper brown chert

Middle tuff

"B2" and "C" ore zones

Green tuff marker

Middle brown chert

"B1" ore zone

Lower brown chert

Footwall volcanics.

A petrographic study of the Mine Series rocks by Dr. J.A. McDonald in 1981 concluded that a variety of intrusives, volcanic, and sedimentary rocks occur in the Mine sequence. Although relatively good examples of end members occur, other rocks display varying proportions of sedimentary and volcanic components due to a complex submarine depositioned environment. Regional epidote-amphibolite grade metamorphism coupled with extensive deformation is superimposed on all units on the mine sequence.

Chemical precipitates including limestone, chert, and iron formation comprise an important part of the Mine Series. Limestones are unusually dark coloured, recrystallized, massive and contain relatively abundant carbonate veinlets. Both cherty and tuffaceous impurities occur in this unit.

A wide variety of cherty exhalites occur in the Mine Series. Pale grey chert with darker bands may contain tourmaline, sphalerite, biotite-epidote, biotite, carbonaceous material or fine grained opaques. Most biotite dominated bands are pyroclastic in origin, Pale brown cherts reflect either small quantities of biotite or sericite.

Chert-magnetite layers and various mixtures of pyrite-pyrrhotite-chalcopyrite in nearly pure quartz are interlayered with banded cherts and suggests that the "iron formation" is probably of exhalative origin as well.

A volcanic conglomerate mapped in the South Granduc Zone is thought to be a facies equivalent to the mine area exhalite. It is a light green sandy, pebbly unit, heterogeneous and locally calcareous. Schistosity is well developed and consistent with lineations plunging at moderate angles to the north.

C.1.d Hanging Wall Series - Volcanics

This is a major andesite unit ranging from poorly bedded mafic tuffs to undeterminate greenschists, some of which may have been flows.

C.1.e Hanging Wall Series - Sediments

This unit consists of well bedded siliceous wackes, light-grey, moderately dense rocks with light green layers and more recessive pinkish (biotitic) laminae. Locally these rocks become sandy and occasionally contain accessory pyrite.

C.1.f Plutonic Rocks and Related Sills and Dikes

The Granduc property is bounded to the south and west by plutonic rocks of the Coast Range Plutonic Complex. These rocks are generally granodiorite to quartz-diorite in composition.

Several small intrusives outcrop on and north of Granduc Mountain. the largest of these is a subconcordant elongate mass of foliated hornblende granodiorite.

Irregular outcrops of diorite are found both east and north of the mine intruding volcanic rocks.

Monzonite sills were identified petrographically from underground drilling and these were found to contain significant gold, tungsten, and molybdenum values.

Aplite and granodiorite sills occur in swarms up to 800 feet wide south and west of the mine. Quartz diorite sills and dikes that range in width from one foot to several tens of feet occur on Granduc Mountain.

C.2 Mine Mineralization

Sulphide mineralization consists of pyrrhotite, chalcopyrite, pyrite, and sphalerite hosted by biotite rich tuffaceous cherts. Magnetite is commonly associated with the mineralized horizons and has been traced by magnetic surveys along strike extensions of the mineralized stratigraphy. The mineralization occurs as disseminations, massive bands, and stringers that parallel bedding and foliation, and irregular high-grade masses in breccia zones.

The massive breccia ore occurs in southwest plunging drag-fold noses. The breccia is a chaotic assemblage of angular to subrounded Mine Series country rock, and quartz and carbonate blebs, supported by a siliceous sulphide matrix.

Unbrecciated ore consists essentially of massive and disseminated sulphides, and coarser grained quartz along planes that generally parallel the foliation on biotite-rich tuffaceous chert. The sulphide content drops off rapidly away from the brecciated high-grade zones.

The ore zones at Granduc average 50 feet thick. The original ore reserve prior to production at Granduc was 32 million tons of 1.83% copper. Approximately half or those reserves were mined out from 1968 to 1983. Known ore-grade mineralization occurs as 5 bodies (A, B1, B2, C, F) that are structurally controlled by southwest plunging phase 2 folding. The A, B1, and F zones are high grade zones that average 1.9% copper. The B2 and C zones average 1.3% and 1.7% copper.

Esso's exploration during operational days of the mine delineated a geologic reserve of 17.4 million tons of 1.85% copper. This reserve is contained in 6 discreet, stratabound bodies within the stratigraphy of the mine series.

C.3 Structure

A surface structural analysis was done on the Granduc property in 1980 by David W. Klepacki and Peter B. Read, Geotex Consultants Limited.

Conclusions derived from the structural analysis, and statistical data are:

1. In the mine area, the prominent foliation is parallel to the axial surfaces of first phase folds. First phase fold axes have a moderate plunge northwesterly or southerly to southeasterly. These folds generally indicate an antiform to the west with younger strata in the core. The major first phase fold must thus be an antiformal syncline which has been folded back on itself.

2. Second phase folds are steep to moderate plunging structures with northeast striking axial surfaces. These folds are deformed in later folding events as demonstrated by second phase fold axes that change in plunge from northeast, through vertical to southwesterly as one proceeds from northeast to southwest in the study area. Second phase axial surfaces do not maintain a constant orientation over the study area.

3. Third phase mesoscopic folds are recognized only near the Granduc and Western faults. Third phase folds postdate steeply plunging second phase folds. Third phase folds are characterized by southerly dipping axial planes and moderately southerly plunging axes.

4. Late open folding in the hanging wall block of the Western Fault brings southwesterly dipping rocks in the southwest, through the vertical to northeasterly dipping strata in the northeast. This late synform has a moderately plunging, southeast trending axis.

5. The Granduc Fault has a post-quartz diorite dike displacement of 650 feet with right-lateral, strike-slip displacement at 201°/07°SW.

Less certain features include:

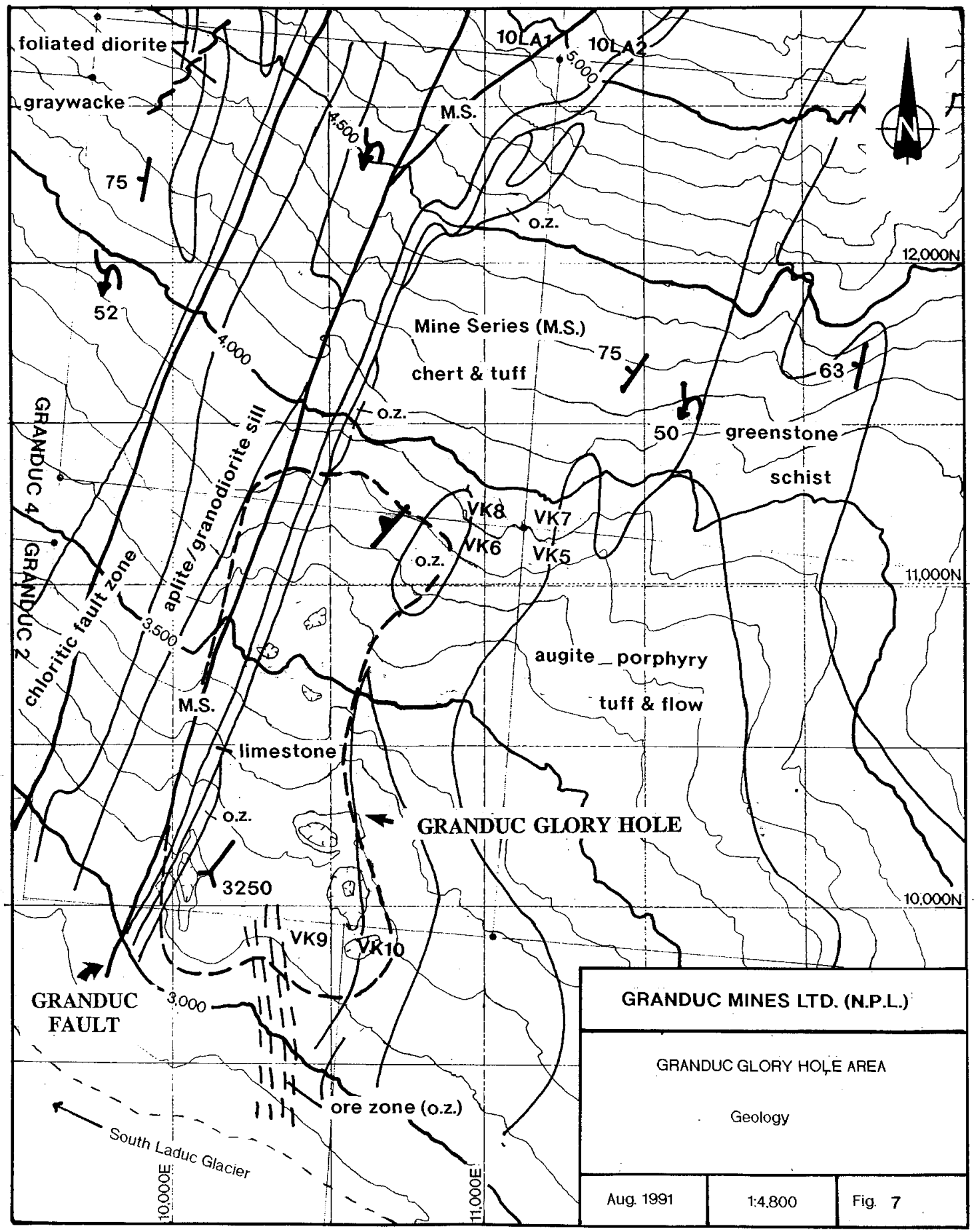
1. The relative age of the large scale "fourth" phase fold in the hanging wall block of the Western Fault. The fold can only be defined as post-phase one and either pre or post-phase three.

2. Displacement along the Western and associated faults is probably also right lateral, as indicated from parasitic folds, and has a pre-dike component.

3. The nature of low-angle faulting in the hanging wall block is unknown although one minor fault shows a thrust component from offset chert beds on a gently northeast dipping fault surface.

D. 1991 EXPLORATION PROGRAM

An orientation geochemical soil and rock sampling program was conducted in the immediate area of a large collapse feature on Granduc Mountain referred to as the Granduc Glory Hole (Fig. 7). A thin veneer of residual soil and abundant rock exposure featuring mine series rocks lent the area favourable for characterizing the surface geochemical signature of Granduc style mineralization.



GRANDUC MINES LTD. (N.P.L.)

GRANDUC GLORY HOLE AREA

Geology

Aug. 1991	1:4,800	Fig. 7

D.1 Granduc Glory Hole

D.1.a Soil Geochemical Orientation Survey

Three contour soil sample lines were run at elevations 3700', 4100', and 4500' ASL across mine series rocks in the Glory Hole area (Fig. 8). Samples were collected from "B" and "C" horizons at 100' intervals using hip-chains for distance control. Samples were analyzed by ICP methods for 24 elements and Au.

Visual analysis of the soil geochemical data (Table 3) indicates that several elements show anomalous concentrations in the area underlain by mine series rocks. Copper, molybdenum, and barium are strongly anomalous, lead and zinc are moderately anomalous, and gold, silver, cadmium, and cobalt are weakly anomalous.

The zone of anomalous multielement soil geochemistry extends from 1W to 5E on Line 3700, from 4W to 4E on Line 4100, and 1W to 6E on L4500 (Fig. 8).

Strongly Anomalous Elements

Copper: Copper is a reliable pathfinder element reflecting Granduc style mineralization in the mine series rocks. Copper values vary from approximately

1000 to >10000 ppm in the areas coincident with mineralized zones in mine series rocks. Values in hanging wall metasediments vary from approximately 150 to 400 ppm.

Molybdenum: Molybdenum geochemical values coincident with the anomalous multielement soil geochemistry are distinctly enhanced, however, not uniformly. Molybdenum values vary from 9 to 31 ppm in mine series rocks but maintain background levels, 1 to 4 ppm, in areas underlain by hanging wall greywackes.

Barium: Barium values coincident with the multielement soil geochemical anomaly are generally >800 ppm and range up to 2750 ppm. Hanging wall rocks contain barium values uniformly <600 ppm; commonly 300 to 500 ppm.

Moderately Anomalous Elements

Lead: Lead geochemical values demonstrate a general increase in magnitude in the anomalous multielement geochemical zone. Whereas the lead background level is approximately 40 ppm, lead values vary from 80 to 2600 ppm within the anomalous zone.

Zinc: Zinc soil geochemistry is similar in character to lead. Although substantial variation exists in zinc values within the anomalous zone, broad anomalous sections are identifiable. Zinc geochemical values, in areas underlain by

greywacke, vary from 100 to 200 ppm while values vary from 200 to 1950 ppm in the vicinity of mine series rocks.

Weakly Anomalous Elements

Gold: Gold geochemical values are generally below detection limit, <5 ppb, in areas removed from mine series rocks. Within the anomalous multielement zone gold values vary from <5 to 180 ppb.

Silver: Silver geochemical values are generally near the detection limit, <0.2 ppm, in areas removed from mine series rocks. Within the anomalous multielement zone silver values vary from <0.2 to 4.6 ppm.

Cadmium: Cadmium geochemical values vary from <0.5 to 4.5 ppm within the multielement anomalous zone. Values peripheral to the mine series rocks are at or near the detection limit of <0.5 ppm.

Cobalt: Cobalt geochemistry is weak and irregular, however, elevated values to 217 ppm, are coincident with the multielement anomalous zone. In areas peripheral to the mine series rocks, values vary from 10 to 40 ppm.

D.1.b Rock Geochemical Orientation Survey

Rock sample locations in the Glory Hole area are shown on Fig. 9 and geochemical analytical data is presented in Table 4. Rock sample descriptions are attached as Appendix B. Rock sampling was carried out in conjunction with the soil survey and consisted of either isolated samples across specific widths or continuous representative chip samples.

Visual analysis of rock geochemical data indicates that four elements including copper, molybdenum, barium, and silver possess significantly greater values in the area underlain by mine series rocks as compared to areas underlain by hanging wall greywackes. A width-specific zone of anomalous multielement geochemistry is not identified in mine series rocks, however, a clear distinction is apparent in the geochemical character of mine series rocks and hanging wall greywackes.

Copper: Rock copper geochemistry is erratically anomalous in areas underlain by mine series rocks. Values up to >10000 ppm Cu occasionally occur but commonly values vary from 50 to 400 ppm. In areas underlain by greywackes, copper values are generally less than 100 ppm.

Molybdenum: Molybdenum rock geochemistry, similar to copper, is erratic, however, areas underlain by greywacke resulted in very low values ranging from <1 to 2 ppm, whereas areas underlain by mine series rocks resulted in values ranging from 10 to 40 ppm.

Barium: Barium rock geochemistry resulted in values ranging from 1000 to 3600 ppm from terrain underlain by mine series rocks and 200 to 500 ppm from areas underlain by greywacke.

Silver: Silver rock geochemistry is erratic. Hanging wall rocks resulted in very low silver values often below the detection limit, <0.2 ppm. Mine series rocks possess silver values ranging from <0.2 to 20.0 ppm.

TABLE 2

GRANDUC GLORY HOLE GEOCHEMICAL SAMPLING SUMMARY

	SOIL GEOCHEMISTRY (PPM)		ROCK GEOCHEMISTRY (PPM)	
Element	Multielement Zone in Mine Series Rocks	Hanging Wall Rocks Greywacke	Mine Series Rocks	Hanging Wall Greywacke
Cu	1000 to >10000	150 to 400	100 to >10000	<100 ppm
Mo	9 to 31	1 to 4	10 to 40	<1 to 2
Ba	800 to 2750	300 to 500	1000 to 3600	200 to 500
Pb	80 to 2600	to 40		
Zn	200 to 1950	100 to 200		
Au	to 180 ppb	<5 ppb		
Ag	to 4.6	<0.2	to 20	<0.2
Cd	to 4.5	<0.5		
Co	to 217	10 to 40		

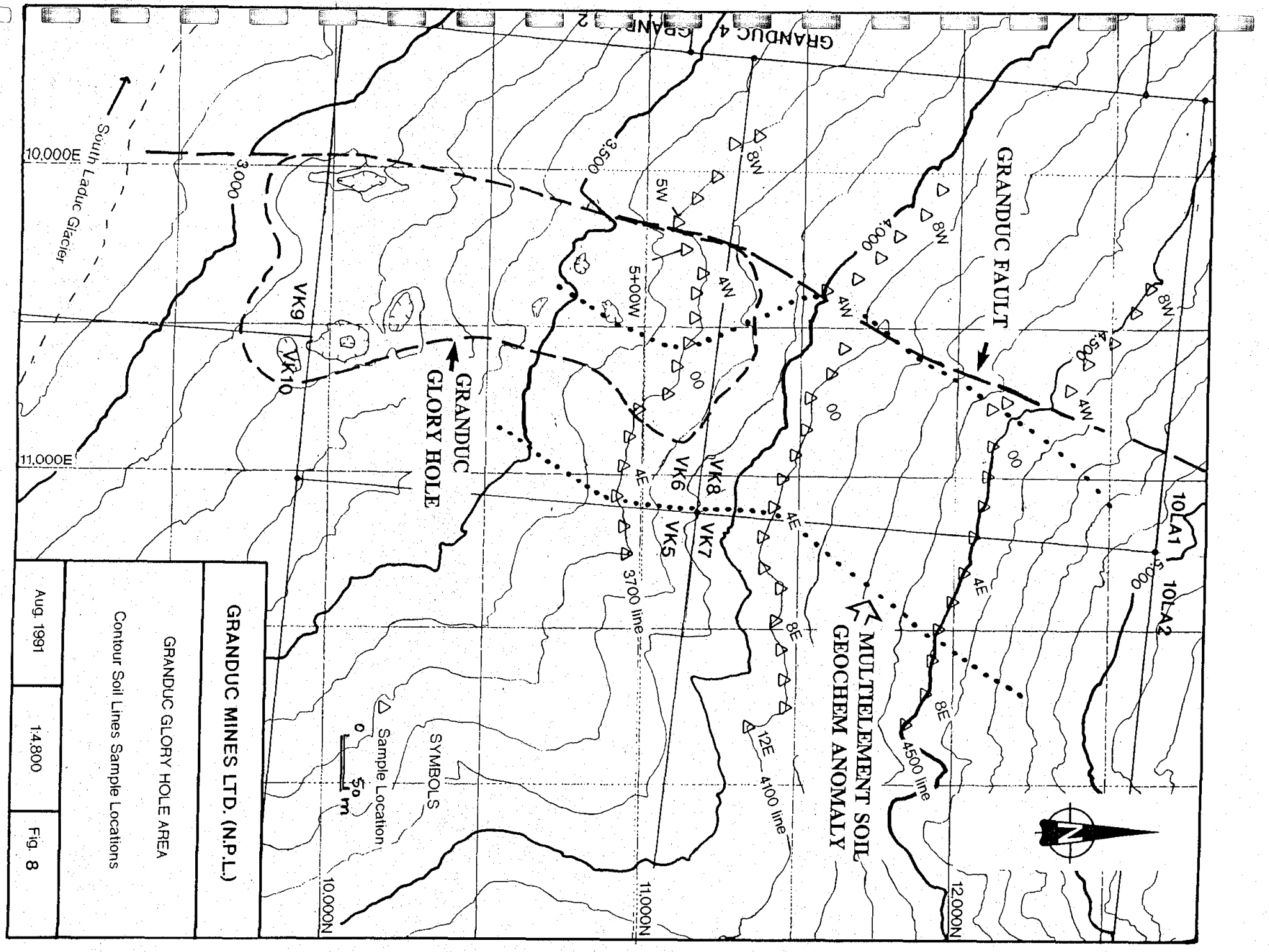


TABLE 3

Sample description	Au ppm FA+AA	Ag ppm AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)
37 00+00E	45	1.6	1110	<0.5	<2	4.0	162	249	3010	8.82	3.58	3160	25	0.95	95	1030	474	108	0.44	228	10	806
37 01+00E	85	1.2	840	<0.5	<2	1.5	187	156	7110	11.10	2.95	1520	9	1.07	93	610	178	178	0.51	207	<10	1630
37 02+00E	180	3.4	1250	<0.5	<2	3.0	57	116	>10000	12.50	2.62	2050	11	0.82	57	1150	246	152	0.53	191	<10	1345
37 03+00E	15	0.6	800	<0.5	<2	4.5	38	217	1605	7.19	4.21	2460	1	2.22	55	1420	192	162	0.57	228	<10	1050
37 04+00E	80	2.4	2750	<0.5	<2	3.0	73	96	6490	8.76	2.48	1565	20	0.71	93	950	516	81	0.38	348	10	1375
37 05+00E	10	3.8	1520	<0.5	2	3.5	74	88	1005	8.11	1.82	2180	31	0.76	69	1610	2600	58	0.29	245	<10	1950
37 06+00E	<5	0.4	500	<0.5	<2	1.5	30	433	449	7.01	5.46	2670	<1	0.65	125	840	168	54	0.40	237	10	416
37 01+00W	<5	<0.2	520	<0.5	<2	0.5	35	159	462	7.30	2.71	1020	9	1.16	53	1080	14	261	0.42	191	<10	168
37 02+00W	<5	<0.2	810	<0.5	<2	<0.5	26	279	1285	6.27	3.42	1205	6	1.82	66	910	38	164	0.44	226	<10	128
37 03+00W	<5	0.8	640	<0.5	<2	3.0	36	410	374	6.96	4.87	1515	9	0.92	172	1450	132	182	0.44	253	<10	284
37 04+00W	<5	0.4	450	<0.5	<2	1.5	81	590	901	7.65	7.00	2400	<1	1.01	269	1350	110	172	0.42	216	<10	292
37 05+00W	25	<0.2	460	<0.5	<2	0.5	26	244	522	7.00	3.24	1335	7	1.61	92	900	68	223	0.45	204	<10	196
37 07+00W	<5	0.2	380	<0.5	<2	3.0	33	896	472	8.07	6.73	2050	10	0.60	205	1100	30	38	0.35	236	20	242
41 01E	35	0.4	940	<0.5	<2	1.0	65	157	1100	6.99	2.33	1800	31	1.09	48	1760	110	115	0.30	198	<10	196
41 02E	<5	1.0	1550	<0.5	<2	2.0	37	114	863	5.80	1.96	2220	19	0.93	55	1710	110	97	0.30	206	<10	298
41 03E	80	1.8	1030	<0.5	18	0.5	59	96	4790	5.75	1.60	680	28	0.50	34	680	108	60	0.31	155	<10	356
41 04E	<5	0.6	910	<0.5	<2	1.0	52	157	863	6.38	2.56	2130	9	1.31	46	1840	130	146	0.42	184	<10	342
41 05E	<5	<0.2	500	<0.5	<2	<0.5	12	167	391	5.75	2.44	775	3	1.73	41	1750	62	130	0.43	182	<10	184
41 06E	<5	0.4	620	<0.5	<2	<0.5	32	209	258	6.26	2.81	1490	4	1.56	50	2390	64	156	0.45	202	10	206
41 07E	<5	0.6	380	<0.5	<2	<0.5	23	195	432	6.33	2.78	995	3	1.52	47	2020	44	133	0.41	192	10	162
41 08E	5	0.4	370	<0.5	<2	<0.5	45	173	557	7.16	2.71	1240	5	1.87	54	1520	34	135	0.40	186	<10	152
41 09E	<5	<0.2	460	<0.5	<2	<0.5	32	95	244	7.18	2.20	1595	3	2.72	33	750	12	230	0.43	208	<10	116
41 10E	<5	<0.2	660	0.5	<2	<0.5	21	358	135	7.11	4.04	4120	2	0.50	102	1020	20	28	0.34	200	60	160
41 11E	<5	0.6	400	<0.5	<2	<0.5	86	288	659	8.00	3.84	1770	3	1.29	89	1520	38	131	0.38	210	<10	158
41 12E	<5	<0.2	480	1.0	<2	<0.5	22	251	326	6.75	3.13	1255	<1	1.53	102	1200	22	253	0.44	215	<10	150
45 00E	115	4.6	1540	<0.5	<2	1.0	73	33	>10000	14.20	2.02	1855	23	0.97	44	1560	392	145	0.43	222	10	572
45 01E	55	2.2	850	<0.5	<2	2.0	110	67	>10000	10.65	1.94	2290	9	0.85	57	1210	82	150	0.31	187	<10	382
45 02E	10	0.8	1310	0.5	<2	1.0	47	106	1165	7.52	1.83	1760	20	1.33	58	2080	80	121	0.36	284	<10	266
45 03E	<5	<0.2	580	1.0	<2	<0.5	12	177	652	5.71	2.31	2200	6	0.83	49	1250	88	88	0.34	188	<10	246
45 04E	<5	<0.2	620	<0.5	<2	5.0	241	26	486	9.67	2.58	2400	1	1.80	21	1430	72	351	0.70	162	<10	764
45 05E	<5	0.6	510	0.5	<2	0.5	36	231	905	7.23	3.47	1195	2	1.28	69	1030	66	139	0.49	217	<10	216
45 06E	110	0.6	480	<0.5	154	<0.5	217	192	976	12.00	3.68	3500	11	0.37	78	750	248	18	0.35	229	50	260
45 07E	20	0.6	450	<0.5	<2	<0.5	72	267	806	8.03	3.85	1425	3	1.77	77	1250	22	179	0.53	218	<10	152
45 08E	<5	<0.2	180	<0.5	<2	<0.5	64	113	612	8.21	2.32	1135	5	2.90	32	1110	8	270	0.41	189	<10	116
45 09E	<5	1.0	400	<0.5	<2	<0.5	15	230	306	6.89	2.76	945	4	1.45	53	1830	34	128	0.43	192	<10	128
L37 05W	<5	0.6	450	<0.5	<2	<0.5	11	166	139	5.43	2.02	890	5	1.33	46	2230	46	181	0.42	172	<10	100
L37 06W	<5	1.0	480	1.0	<2	<0.5	31	170	268	6.63	2.22	2510	8	1.56	56	3060	62	209	0.46	204	<10	176
L37 07W	<5	<0.2	320	<0.5	<2	0.5	16	310	155	6.40	3.53	1100	1	1.22	105	1520	22	208	0.39	186	<10	110
L37 08W	<5	<0.2	490	<0.5	<2	<0.5	19	147	140	6.34	2.21	1425	7	1.64	42	2710	46	231	0.53	222	<10	120
L37 09W	<5	2.6	420	<0.5	<2	0.5	16	197	211	6.58	2.65	1120	2	1.31	59	2010	40	174	0.46	189	<10	124
L41 00W	<5	0.8	960	<0.5	<2	1.5	74	126	913	5.69	1.94	2380	22	1.14	41	1920	98	117	0.32	190	<10	184
L41 01W	<5	0.8	910	<0.5	4	0.5	60	172	2400	7.38	2.67	1390	12	1.75	60	1740	96	140	0.45	255	<10	236
L41 02W	30	1.0	550	<0.5	<2	0.5	16	101	1905	7.32	1.84	835	11	0.81	33	2290	62	141	0.41	183	<10	264
L41 04W	5	0.4	330	<0.5	<2	<0.5	27	52	1515	8.31	2.04	1420	2	2.11	26	930	74	247	0.57	244	<10	192
L41 05W	<5	0.6	450	<0.5	<2	<0.5	17	132	807	6.67	2.10	810	3	1.35	46	1280	132	164	0.45	195	<10	362
L41 06W	<5	0.6	420	<0.5	<2	<0.5	12	114	608	6.29	1.97	860	5	1.45	33	1620	58	195	0.49	210	<10	162
L41 07W	<5	0.8	430	<0.5	<2	<0.5	13	173	252	6.27	2.35	1030	6	1.48	46	2420	42	191	0.48	201	<10	124
L41 08W	<5	0.2	420	<0.5	<2	<0.5	16	149	97	6.05	2.16	1160	5	1.39	43	2070	34	180	0.51	192	<10	96
L41 09W	<5	0.2	420	<0.5	<2	<0.5	24	196	313	7.33	2.44	1675	6	1.77	58	2050	48	160	0.46	184	<10	1
L45 01W	160	4.4	940	<0.5	<2	1.0	129	122	6900	10.05	2.35	1745	25	0.90	75	1630	264	107	0.36	215	<10	394
L45 1+50W	<5	0.6	640	<0.5	<2	1.0	27	249	758	7.00	3.00	2170	5	1.29	107	1390	72	120	0.48	244	<10	256
L45 4+10W	<5	0.4	390	<0.5	<2	<0.5	16	134	194	5.24	2.10	1115	2	1.24	46	3400	32	159	0.38	175	<10	100
L45 05W	<5	<0.2	430	<0.5	<2	<0.5	16	150	162	5.81	2.30	1110	4	1.33	49	2460	42	187	0.49	187	<10	126
L45 06W	45	0.6	400	<0.5	<2	<0.5	19	266	336	6.46	3.10	1085	3	1.30	77	1720	40	168	0.43	195	<10	126
L45 07W	<5	0.2	430	<0.5	<2	0.5	25	216	405	6.16	2.96	1835	1	1.46	63	1380	32	210	0.48	209	<10	140
L45 08W	<5	<0.2	450	<0.5	<2	<0.5	21	184	291	5.73	2.68	1605	3	1.34	54	1960	38	179	0.43	170	<10	134

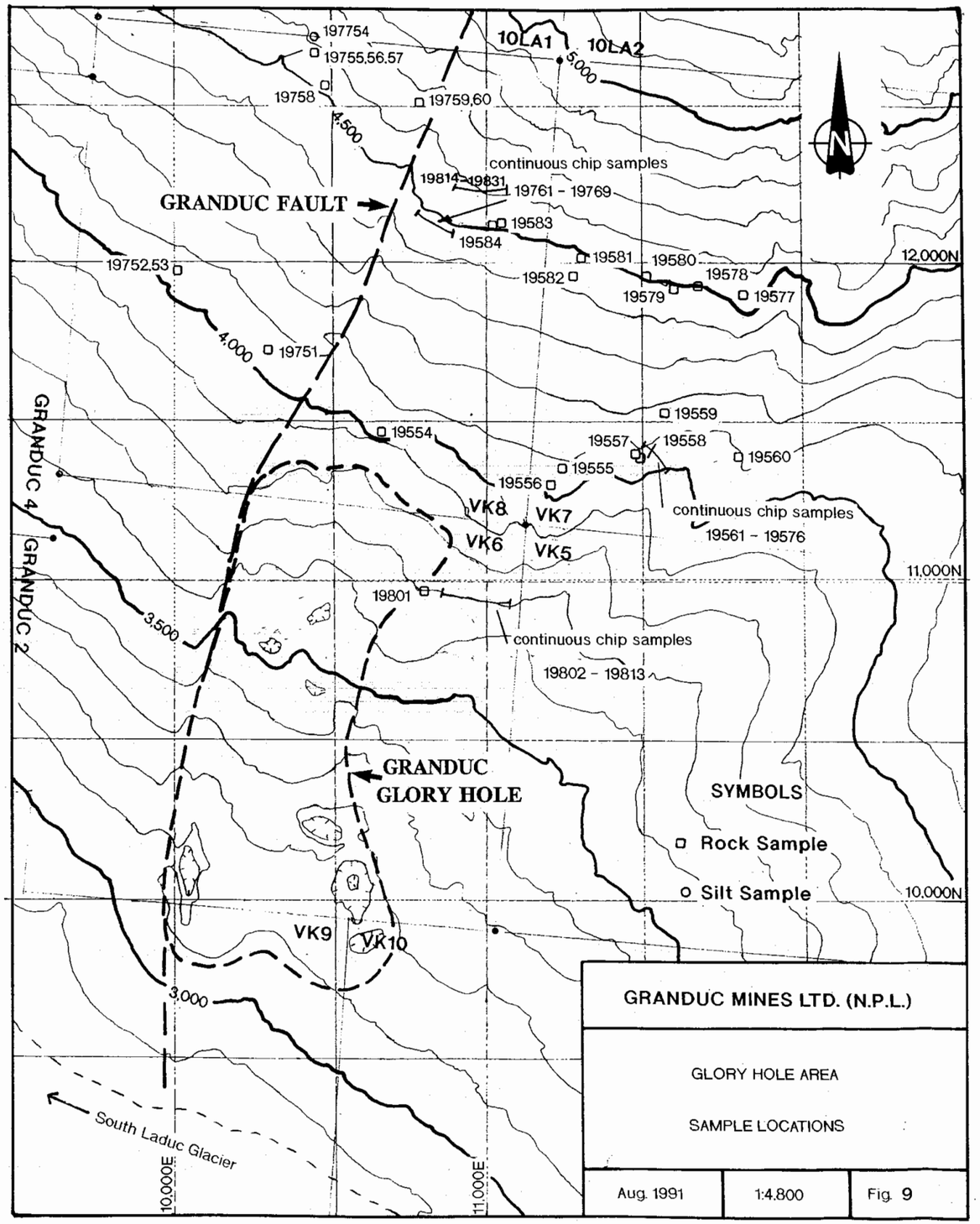


TABLE 4

GRANDUC GLORY HOLE AREA

GEOCHEMICAL ANALYSIS

Sample description	Au ppm FA+AA	Ag ppb AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn (ICP)
19554	<5		<0.2	1530	<0.5	4	<0.5	1	240	159	3.21	0.56	115	53	0.16	14	1070	244	17	0.13	325	<10	40
19555	<5		0.4	590	<0.5	12	1.0	61	167	415	3.63	0.57	80	38	0.06	24	1160	46	10	0.14	200	<10	188
19556	<5		1.2	1040	<0.5	<2	<0.5	2	158	83	1.44	0.09	60	30	0.06	5	420	18	10	0.04	22	<10	18
19557	<5		0.6	1680	<0.5	4	<0.5	3	139	158	2.11	0.89	95	3	0.46	9	380	80	37	0.15	120	<10	66
19558	<5		3.0	200	<0.5	626	0.5	4	216	91	4.58	0.58	445	7	0.10	6	330	370	7	0.13	84	370	58
19559	<5		0.8	150	<0.5	8	<0.5	18	237	449	3.50	0.54	165	9	0.91	77	270	26	36	0.14	98	<10	82
19560	<5		<0.2	310	<0.5	<2	<0.5	59	70	27	10.65	1.15	1745	11	0.20	26	1340	4	40	0.34	270	30	80
19561	<5		1.4	1500	<0.5	<2	<0.5	3	182	650	2.89	1.21	215	38	0.33	15	1840	18	33	0.28	297	<10	88
19562	<5		1.4	1790	<0.5	<2	<0.5	1	109	127	2.71	0.91	95	35	0.08	4	1450	64	12	0.27	201	<10	36
19563	<5		1.0	1590	<0.5	<2	<0.5	2	99	158	2.99	1.33	200	13	0.47	12	1170	74	72	0.30	165	<10	96
19564	<5		<0.2	1530	<0.5	<2	1.0	129	139	87	2.99	1.02	190	11	0.43	17	530	88	54	0.18	193	<10	96
19565	<5		<0.2	1440	<0.5	<2	0.5	12	72	134	4.55	2.58	615	6	2.29	19	1290	50	216	0.43	202	<10	218
19566	<5		0.4	1620	<0.5	<2	1.0	227	112	142	4.20	1.91	495	38	0.86	31	1770	100	126	0.29	310	<10	156
19567	<5		<0.2	1370	<0.5	<2	0.5	9	122	93	3.33	1.65	505	37	1.07	15	1220	200	127	0.31	297	<10	160
19568	<5		<0.2	1350	<0.5	<2	0.5	7	121	73	3.47	2.21	705	7	1.79	15	950	16	216	0.37	195	<10	138
19569	<5		<0.2	1680	<0.5	<2	<0.5	53	162	108	3.34	1.50	385	58	1.22	22	1850	72	152	0.32	475	<10	96
19570	<5		<0.2	1800	<0.5	<2	<0.5	5	120	96	2.68	0.81	110	13	0.41	18	500	64	44	0.22	112	<10	52
19571	45		<0.2	1900	<0.5	<2	<0.5	5	191	91	2.36	0.84	110	12	0.65	12	500	22	53	0.24	148	<10	36
19572	<5		<0.2	1090	<0.5	<2	<0.5	1	253	86	2.46	1.02	80	10	0.45	8	320	24	35	0.14	179	<10	42
19573	10		<0.2	1800	<0.5	<2	0.5	6	109	134	3.92	2.34	465	7	2.00	23	2470	14	177	0.36	193	<10	160
19574	<5		0.4	1570	<0.5	<2	<0.5	6	102	196	3.13	1.47	385	4	1.25	24	970	28	66	0.26	138	<10	84
19575	<5		<0.2	2030	<0.5	<2	0.5	3	88	177	3.47	1.35	370	9	0.78	20	1230	54	76	0.24	171	<10	162
19576	<5		<0.2	2170	<0.5	<2	0.5	4	79	172	3.34	0.64	75	26	0.10	16	1520	80	13	0.17	250	<10	124
19577	<5		<0.2	1130	2.5	<2	<0.5	3	48	20	0.51	0.17	640	<1	5.27	2	530	8	188	0.16	15	<10	12
19578	<5		<0.2	390	<0.5	<2	<0.5	10	151	107	5.63	2.69	900	5	4.29	38	790	<2	346	0.44	177	<10	70
19579	<5		<0.2	450	<0.5	<2	<0.5	16	39	233	2.46	1.71	525	26	5.57	14	1300	10	309	0.38	112	<10	98
19580	25		4.8	510	<0.5	<2	0.5	76	99	1435	6.60	2.87	1235	3	2.74	25	1200	24	338	0.54	250	<10	154
19581	<5		<0.2	870	<0.5	<2	<0.5	13	30	160	4.90	1.90	715	<1	3.26	5	1310	8	423	0.55	127	<10	62
19582	<5		0.8	90	<0.5	<2	<0.5	<1	75	78	0.70	0.02	25	1	0.02	4	160	4	3	0.01	9	<10	6
19583	<5		<0.2	670	<0.5	<2	0.5	14	118	74	5.59	2.51	1000	<1	3.71	35	1020	<2	238	0.48	208	<10	118
19584	<5		0.4	4430	<0.5	<2	<0.5	5	153	1050	5.01	0.90	215	60	0.11	49	6040	22	31	0.22	856	<10	80
19751	<5		<0.2	520	<0.5	<2	<0.5	13	50	156	6.70	2.01	1315	1	3.72	15	1110	<2	239	0.65	244	<10	134
19752	45		<0.2	420	<0.5	<2	0.5	36	374	262	6.84	4.20	1235	2	1.56	126	1250	78	192	0.40	199	10	138
19753	<5		<0.2	180	<0.5	<2	<0.5	17	102	21	2.97	1.65	995	1	4.09	60	490	4	276	0.22	74	<10	24
19754	25		0.4	360	<0.5	<2	1.0	36	379	272	6.70	4.36	1280	<1	1.43	131	1280	90	175	0.40	201	<10	132
19755	<5		<0.2	350	2.0	<2	<0.5	33	381	137	7.39	3.77	6210	<1	0.35	71	930	10	141	0.25	219	20	82
19756	<5		<0.2	770	<0.5	<2	<0.5	10	53	90	5.05	1.85	850	1	3.20	15	810	8	513	0.56	151	<10	88
19757	480		0.6	430	<0.5	<2	<0.5	1	131	43	4.43	0.68	125	1	0.21	13	180	40	20	0.28	149	<10	44
19758	<5		<0.2	420	<0.5	<2	<0.5	18	63	98	7.29	2.85	1165	<1	3.68	20	980	<2	398	0.63	272	<10	96
19759	<5		<0.2	1070	1.0	<2	<0.5	9	56	34	5.77	2.36	1505	<1	3.30	20	1410	18	418	0.86	145	<10	244
19760	<5		<0.2	2670	1.0	<2	<0.5	6	80	20	3.47	1.24	460	<1	3.07	7	1430	6	789	0.52	74	<10	54
19761	1250	0.042	20.0	230	<0.5	<20	<0.5	19	70	>10000	19.20	1.45	545	16	0.15	35	1070	24	13	0.23	171	10	318
19762	5		2.4	1260	<0.5	<2	0.5	46	147	1280	3.09	1.02	310	15	0.12	23	870	66	25	0.20	123	<10	92
19763	160		3.0	350	<0.5	<2	1.0	148	129	8550	7.28	1.34	340	6	0.42	27	930	10	54	0.30	126	<10	158
19764	<5		<0.2	2560	<0.5	<2	<0.5	7	120	415	4.08	2.04	340	<1	0.64	39	560	8	58	0.50	147	<10	78
19765	<5		<0.2	480	<0.5	<2	<0.5	9	242	899	1.10	0.58	230	<1	0.03	10	300	6	10	0.09	46	<10	28
19766	<5		<0.2	2020	<0.5	<2	<0.5	11	130	1965	4.09	1.42	390	5	0.32	29	470	10	29	0.34	121	<10	98
19767	100		7.2	360	<0.5	<20	2.0	78	49	>10000	>25.0	0.78	940	150	0.29	34	450	124	121	0.14	245	<50	200
19768	<5		<0.2	590	0.5	4	<0.5	14	72	221	5.33	2.16	1800	1	1.80	21	1490	4	382	0.44	213	<10	70
19769	210		8.0	1500	<0.5	<20	6.5	156	115	>10000	>25.0	3.98	2450	55	0.83	72	2190	820	165	0.42	630	50	1000
19801	<5		<0.2	2220	<0.5	<2	2.0	54	40	7820	6.21	1.76	1670	<1	2.76	21	1570	30	364	0.50	234	<10	508
19802	<5		<0.2	1880	<0.5	<2	2.0	18	92	756	5.43	2.53	1225	<1	2.96	38	1570	20	402	0.53	265	<10	430
19803	<5		<0.2	1390	<0.5	6	7.0	21	82	3790	4.48	2.15	975	<1	1.07	55	1060	28	94	0.55	226	<10	1470
19804	<5		<0.2	110	<0.5	10	2.0	7	136	156	1.41	0.69	525	1	0.02	28	290	172	11	0.03	20	<10	412
19805	<5		0.8	1840	<0.5	4	4.0	27	67	1835	3.67	1.21	940	4	1.28	32	1000	90	95	0.34	203	<10	532
19806	<5		2.0	2110	<0.5	18	4.5	12	130	410	1.80	0.57	815	2	0.15	18	220	466	23	0.12	84	<10	576
19807	<5		<0.2	1760	<0.5	12	<0.5	3	161	148	3.25	0.61	105	11	0.32	11	590	86	20	0.18	230	<10	92
19808	15		<0.2	1140	<0.5	10	<0.5	6	139	204	2.55	0.81	90	3	0.60	24	220	36	40	0.14	60	<10	80
19809	<5		<0.2	2790	<0.5	6	<0.5	3	131	133	2.63	1.15	100	2	0.66	16	510	26	61	0.22	110	<10	68
19810	<5		0.6	2150	<0.5	8	0.5	4	151	213	3.16	1.26	150	3	0.63	18	460	104	42	0.21	117	<10	128
19811	<5		1.0	1980	<0.5	10	0.5	5	115	189	4.14	1.42	250	13	0.90	19	1420	690	58	0.27	240	<10	260
19812	<5		3.4	1910	<0.5	12	0.5	<1	137	452	4.15	0.55	65	47	0.12	5	2110	1200	29	0.16	446	<10	226
19813	<5		0.8	1610	<0.5	6	2.5	16	60	112	4.41	1.93	745	7	1.39	17	800	290	123	0.32	184	<10	548
19814	20		10.2	1100	<0.5	<2	3.0	45	76	7640	5.53	1.77	880	4	1.50	26	2140	86	147	0.38	152	<10	300
19815	45		5.6	1450	<0.5	<20	0.5	42	119	>10000	7.06	1.63	505	27	0.39	46	1020	32	48	0.34	164	10	242
19816	10		1.8	2560	<0.5	<2	1.5	61	96	3520	4.72	1.68	630	11	1.14	46	930	100	109	0.41	188	<10	288
19817	85		8.6	940	<0.5	20	2.0	65	92	>10000	10.45	1.72	835	14	0.49	43	1170	266	47	0.30	186	20	556
19818	70		7.4	1580	<0.5	<20	4.0	61	58	>10000	8.43	2.23	1325	3	1.16	43	1080	106	126	0.41	216	10	740
19819	60		3.6	2560	<0.5	16	1.5	70	87	5920	5.72	2.04	860	4	0.57	33	1050	264	88	0.38	189	<10	450
19820	50		2.2	2140	<0.5	6	1.0	40	94	5280	6.10	1.82	780	9	0.74	31	830	30	114	0.34	169	<10	226
19821	245		10.8	250	<0.5	<20	1.5	58	49	>10000	17.80	1.39	1300	152	0.74	29	620	26	112	0.23	231	10	302
19822	65		2.4	610	<0.5	<2	3.5	25	54	4710	3.87	1.09	1340	7	0.84	18	740	60	203	0.20	113	<10	520
19823	5		<0.2	780	<0.5	<2	0.5	10	46	220	5.66	1.75	3380	1	1.29	21	1350	4	237	0.47	171	<10	88
19824	<5		<0.2	770	0.5	<2	<0.5	12	42	173	4.91	1.65	1860	1	1.69	16	1360	<2	312	0.39	199	<10	84
19825	<5		<0.2	640	0.5	4	<0.5	8	89	72	4.10	1.72	1845	1	1.29	21	980	2	201	0.29	141	<10	62
19826	50		1.4	2900	<0.5	<2	1.0	60	75	9300	17.40	1.05	1210	9	0.48	24	730	24	92	0.25	194	<10	228
19827	50		2.2	830	<0.5	10	0.5	49	111	8040	5.50	1.37	755	30	0.57	28	760	12	68	0.26	132	<10	178
19828	25		0.6	1740	0.5	6	1.0	38	91	4770	4.39	1.61	720	23	0.38	43	810	20	46	0.29	183	<10	178
19829	<5		<0.2	1100	<0.5	10	1.0	33	76	3010	4.34	1.41	825	11	1.03	34	700	28	112	0.35	157	<10	186
19830	<5		0.4	2730	0.5	14	0.5	11	73	175	3.90	1.14	495	11	0.56	26	1020	140	49	0.24	242	<10	206
19831	<5		<0.2	3600	<0.5	10	<0.5	2	69	81	3.63	0.92	110	8	0.20	14	790	106	21	0.17	314	<10	126

D.2 South Granduc Zone

D.2.a Geology

The South Granduc Zone was mapped by previous workers and shows a thin limestone horizon wrapping around the South Granduc Zone cliff-face with several fold re-entrants. A gossan is developed in volcanic conglomerates on the west side of the limestone. Since the limestone is thought to be correlative with the Granduc Limestone to the north and dips of the schistosity are uniformly west, the sequence is thought to be overturned.

The volcanic conglomerate is thought to be facies equivalent of the mine area exhalite. It is a light green sandy to pebbly unit which is inhomogeneous and locally calcareous. Schistosity is well developed and consistent with lineations plunging at moderate angles to the north.

Granduc Mines Ltd. tested this zone with six drill holes from the 3400' level adit. Drill hole #250 successfully intersected two zones assaying 3.84% Cu over 47.0' and 3.27% Cu over 45.0'. True thicknesses are believed to be substantially less than the drill footages indicated.

D.2.b Discussion of Results

A total of 22 rock samples were collected and submitted for analysis from two areas in the South Granduc Zone area. Thirteen samples were collected, from the South Granduc Zone gossan, across 130 feet. An additional 9 samples were collected from an area adjacent to the central fault approximately 1000 feet south of the South Granduc Zones (Fig. 10). Results are tabulated in Table 5.

Multielement analysis indicates that only copper and barium exhibit anomalous concentrations in the South Granduc Zone. Copper values range from 1295 to >10000 ppm and barium values range from 760 to 1840 ppm. Except for one sample, 1.6 ppm, silver values are below detection levels. Gold values are either below detection levels or weakly anomalous to 50 ppb (Table 5).

A zone of quartz veining and patchy sericite-chlorite $\pm$ biotite alteration located 300 metres south of the South Granduc Zone. The vein alteration zone occurs adjacent to the Central Fault and is underlain by andesitic agglomerates. The highest analytical values were derived from a two foot quartz-sulphide vein, sample 19858, which assayed 0.154 oz/t Au, >100 ppm Ag, and >10000 ppm Pb.

Two additional samples 19852 and 19860 were anomalous in gold, 770 and 430 ppb, silver 22.4 and 5.8 ppm, and lead 6000 and 3200 ppm respectively.

Numerous well mineralized float boulders were observed down slope and on the South Leduc glacier.

The quartz-sulphide veins and related alteration haloes occupy tension gashes, associated with the Central Fault. Strike length of the longest quartz vein mapped and sampled, sample 19858 is approximately 40 feet long. The economic potential of the infrequent quartz-sulphide veining associated with the Central Fault is not significant.

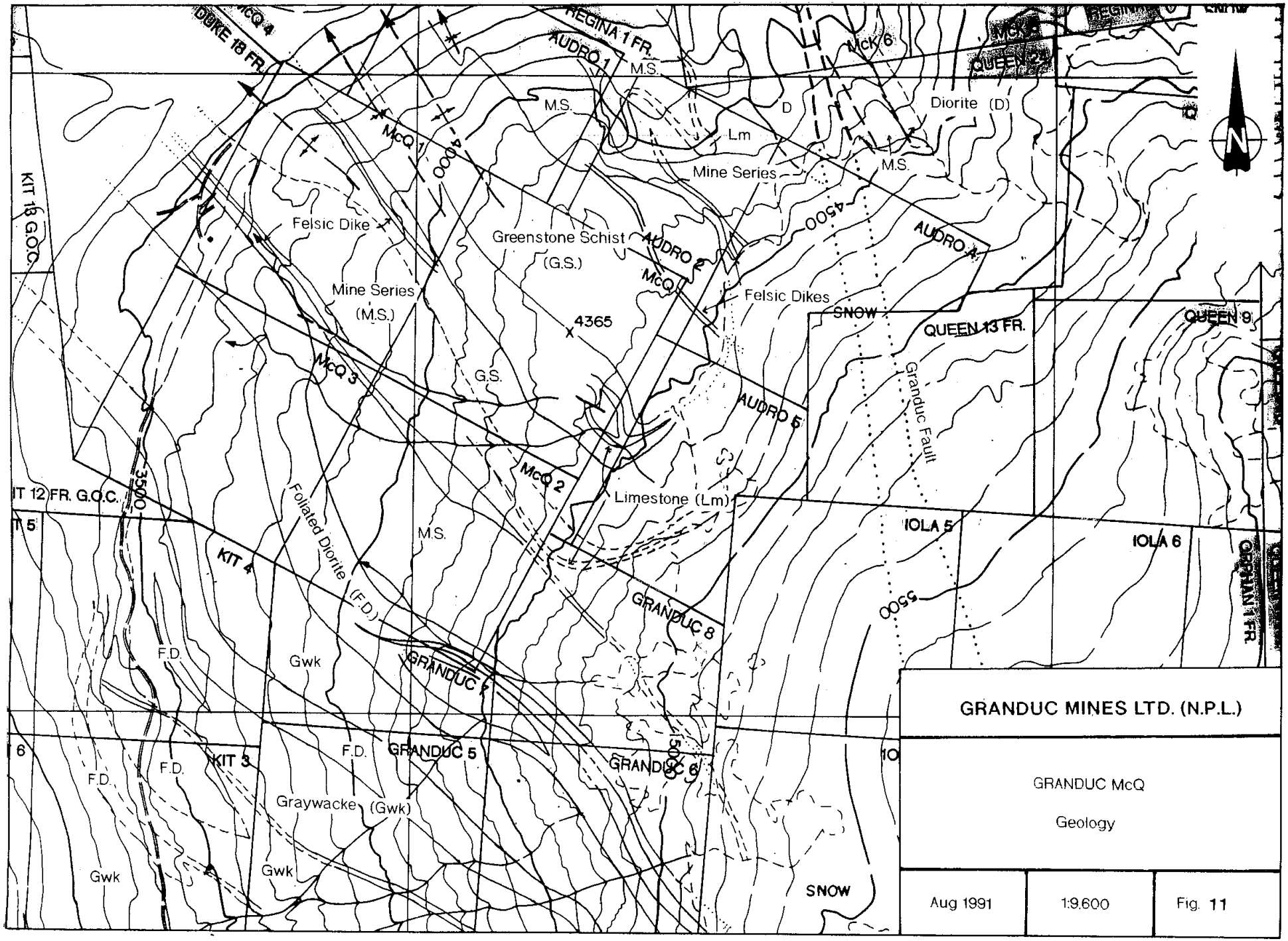
D.3 Granduc McQ

D.3.a Geology

The Granduc McQ area encompasses the northern extension of mine series rocks west of the Granduc Fault, located on the north and northwestern slope of Granduc Mountain (Fig. 11). The mine series rocks occur in two separate northwesterly trending bands each approximately 1000 feet wide, and an intermediate zone approximately 300 feet wide.

The southwestern mine series band trends across McQ 2 claim and consists of dark green-black andesite flows and pyroclastics, dark and medium grey laminated pyritic cherts and fissile light grey pyritic cherty tuffs.

The northeastern mine series rocks trend across Audro 2 claim and consist of quartz-sericite-pyrite altered mafic and felsic tuffs, felsic and cherty tuffs and sediments, and



GRANDUC MINES LTD. (N.P.L.)

GRANDUC McQ

Geology

Aug 1991	1:9,600	Fig. 11

recrystallized limestone. Sulphide mineralization consists of disseminated and banded pyrite with minor pyrrhotite and chalcopyrite hosted by felsic and cherty rocks.

D.3.b Discussion of Results

The Granduc McQ area was evaluated by means of soil and rock geochemical sampling, prospecting and geological mapping. Two contour soil sample traverses were conducted across the McQ mine series rocks (Fig. 12). Several rock and sediment samples were also collected (Fig. 13). The geochemical results are presented in Tables 6 and 7.

Rock and soil geochemical sampling of the McQ 2 mine series rocks failed to detect anomalous geochemical trends for any of the 24 elements analyzed.

Audro 2 mine series rocks samples 19795, 797 and 800 contain geochemically anomalous concentrations of gold, silver, copper, lead, and zinc. Geochemical values varied up to 110 ppb, 7.8 ppm, 3330 ppm, 256 ppm, 1750 ppm respectively (Table 7).

Numerous widespread float boulders containing semi-massive to massive sulphides including pyrite, chalcopyrite, galena, and magnetite were discovered on McK 6 claim, samples 19951 and 19952. ICP analysis resulted in values of 650 and 780 ppb Au, 24.2 and >1000 ppm Ag, >10000 ppm Cu, 940 and >10000 Pb, and 134 and 6040 ppm Zn.

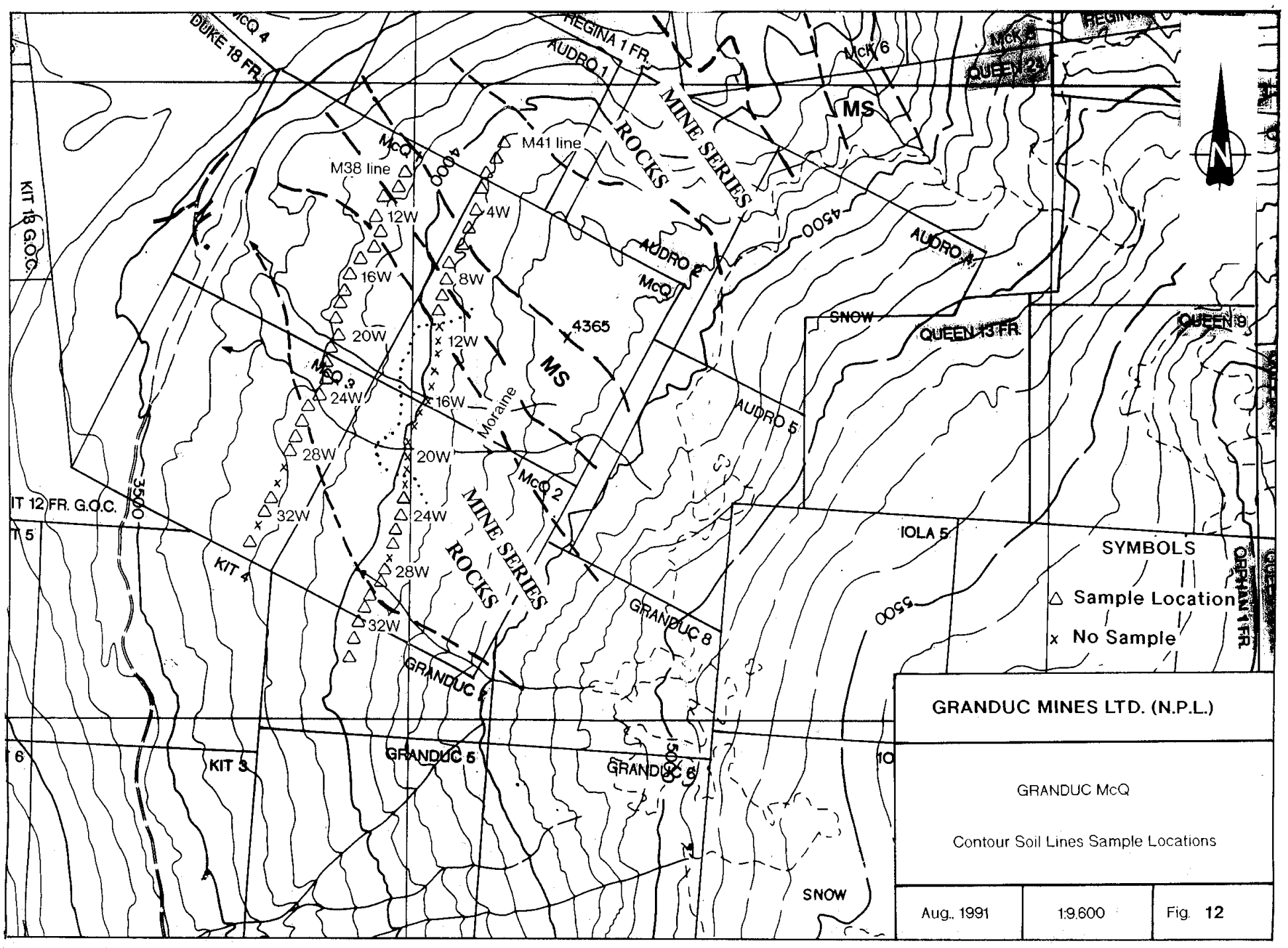


TABLE 6

Sample description	Au ppm FA+AA	Ag ppm AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)
M38 09W	15	<0.2	380	<0.5	<2	<0.5	3	105	22	2.58	1.14	570	1	1.59	24	1210	20	229	0.38	110	<10	40
M38 10W	<5	<0.2	260	<0.5	<2	<0.5	4	155	59	6.35	1.61	625	2	1.46	34	1990	36	132	0.41	123	<10	72
M38 11W	<5	<0.2	330	<0.5	<2	<0.5	7	282	46	5.29	3.12	820	4	1.55	73	1760	20	219	0.50	191	<10	82
M38 12W	<5	<0.2	340	<0.5	<2	0.5	18	291	123	6.00	3.98	1510	<1	2.17	82	1260	8	427	0.47	200	<10	138
M38 13W	<5	<0.2	270	<0.5	<2	<0.5	6	199	73	4.02	2.36	555	1	1.63	59	1350	14	170	0.38	132	<10	64
M38 14W	<5	<0.2	370	<0.5	<2	<0.5	16	292	70	6.18	3.40	1895	1	1.88	75	2540	16	221	0.46	173	<10	104
M38 15W	35	<0.2	370	<0.5	<2	<0.5	21	328	110	5.38	3.91	1300	<1	1.97	102	1170	6	241	0.44	179	<10	88
M38 16W	<5	<0.2	190	<0.5	<2	<0.5	8	271	28	5.94	2.98	990	1	1.28	63	1260	10	134	0.41	143	<10	64
M38 17W	<5	<0.2	380	<0.5	<2	<0.5	20	320	147	5.85	4.02	1500	1	1.59	98	1710	6	237	0.43	191	<10	96
M38 18W	<5	<0.2	260	<0.5	<2	<0.5	6	207	55	5.15	2.19	645	2	1.44	47	1270	10	165	0.43	139	<10	66
M38 19W	<5	<0.2	280	<0.5	<2	<0.5	13	252	103	5.78	3.03	975	2	1.44	74	1830	6	194	0.41	177	<10	82
M38 20W	<5	<0.2	210	<0.5	<2	<0.5	9	164	47	4.99	1.79	880	2	1.30	44	1340	12	141	0.35	112	<10	72
M38 21W	<5	<0.2	300	<0.5	<2	<0.5	11	229	82	6.03	3.05	825	2	1.65	61	660	10	208	0.45	161	<10	78
M38 22W	<5	<0.2	310	<0.5	<2	<0.5	9	187	63	5.89	2.40	780	<1	1.33	52	1060	10	183	0.42	148	<10	72
M38 23W	15	<0.2	460	<0.5	<2	<0.5	16	226	120	5.44	3.26	1110	1	1.84	69	1480	14	246	0.49	192	<10	110
M38 24W	<5	<0.2	360	<0.5	<2	<0.5	22	244	69	5.57	3.01	1310	9	1.82	60	1170	10	240	0.43	161	<10	102
M38 25W	<5	<0.2	550	<0.5	<2	0.5	21	220	192	5.70	3.18	1325	1	2.12	74	1030	24	296	0.47	181	<10	122
M38 26W	<5	<0.2	300	<0.5	<2	<0.5	17	372	82	6.01	3.98	1085	7	1.54	78	1080	20	141	0.44	168	<10	84
M38 27W	<5	<0.2	420	<0.5	<2	<0.5	18	246	119	5.82	3.19	1175	3	1.95	72	1330	10	282	0.44	182	<10	100
M38 28W	<5	<0.2	310	<0.5	<2	0.5	11	249	79	6.28	2.98	815	<1	1.48	62	930	6	214	0.42	188	<10	72
M38 31W	<5	<0.2	480	<0.5	<2	<0.5	11	254	112	5.36	3.08	800	4	1.49	79	1290	14	206	0.42	177	<10	108
M38 32W	<5	<0.2	460	<0.5	<2	<0.5	11	268	91	5.20	3.27	770	1	1.57	77	1050	10	211	0.44	182	<10	106
M38 34W	<5	<0.2	260	<0.5	<2	<0.5	8	197	58	6.46	2.32	705	<1	1.42	47	670	12	204	0.50	193	<10	66
M41 00W	<5	<0.2	290	<0.5	<2	<0.5	14	340	87	5.64	3.72	770	<1	1.58	70	930	6	179	0.36	213	<10	90
M41 01W	<5	<0.2	310	<0.5	<2	<0.5	15	261	189	5.85	2.46	1000	1	2.02	73	1350	8	163	0.48	175	<10	110
M41 02W	<5	<0.2	360	<0.5	<2	0.5	18	306	78	5.68	3.58	1050	<1	1.43	72	1560	10	263	0.51	219	<10	90
M41 03W	<5	<0.2	330	<0.5	<2	<0.5	18	396	93	5.80	4.05	1235	<1	1.62	106	1420	8	253	0.48	209	<10	110
M41 04W	<5	<0.2	530	<0.5	<2	<0.5	14	80	106	5.99	2.54	2050	2	1.83	34	1320	12	318	0.59	194	<10	130
M41 05W	<5	<0.2	380	<0.5	<2	<0.5	5	99	44	5.18	1.63	475	1	1.33	27	1410	6	271	0.47	145	<10	78
M41 06W	<5	<0.2	340	<0.5	<2	<0.5	19	297	120	6.29	3.25	1175	3	1.46	92	1140	12	163	0.43	184	<10	102
M41 07W	<5	<0.2	360	<0.5	<2	<0.5	18	387	96	6.20	4.51	1155	<1	1.68	125	970	10	185	0.47	204	<10	114
M41 08W	<5	<0.2	430	<0.5	<2	<0.5	4	113	29	5.33	1.48	610	1	1.10	29	1400	0	253	0.49	145	<10	64
M41 09W	<5	<0.2	390	<0.5	<2	<0.5	10	292	24	5.38	3.60	1420	3	1.57	69	1040	22	272	0.48	187	<10	86
M41 10W	<5	<0.2	250	<0.5	<2	<0.5	11	380	54	6.75	3.88	780	<1	1.34	96	1260	8	163	0.43	183	<10	80
M41 22.7W	<5	<0.2	410	<0.5	<2	<0.5	8	170	86	5.01	2.62	625	2	1.45	52	1100	24	178	0.45	177	<10	108
M41 24W	<5	<0.2	460	<0.5	<2	<0.5	10	209	78	5.52	3.14	785	4	1.71	63	1060	18	232	0.49	200	<10	120
M41 25W	<5	<0.2	350	<0.5	<2	0.5	19	471	123	6.02	5.07	1060	<1	1.61	119	950	12	200	0.44	201	<10	112
M41 26W	<5	<0.2	650	<0.5	<2	0.5	18	206	154	5.79	3.34	1200	<1	2.12	75	1210	16	289	0.51	185	<10	142
M41 28W	<5	<0.2	650	<0.5	<2	<0.5	21	211	160	5.71	3.04	1140	4	1.90	83	1130	16	261	0.51	194	<10	134
M41 29W	<5	<0.2	410	<0.5	<2	<0.5	16	197	104	5.68	2.68	1045	4	1.44	55	1020	20	183	0.47	182	<10	118
M41 30W	<5	<0.2	490	<0.5	<2	0.5	20	221	113	5.82	3.03	1045	3	1.70	75	1150	20	225	0.44	188	<10	130
M41 31W	<5	<0.2	220	<0.5	<2	<0.5	18	347	176	5.83	4.48	1060	1	1.71	103	860	10	198	0.41	188	<10	118
M41 32W	<5	<0.2	670	<0.5	<2	<0.5	27	282	182	6.28	3.75	1375	3	1.81	108	1110	14	263	0.47	193	<10	136
M41 33W	<5	<0.2	210	<0.5	<2	<0.5	10	346	45	5.53	4.08	760	<1	1.41	86	800	8	169	0.41	176	10	88
M41 34W	<5	<0.2	250	<0.5	<2	<0.5	24	390	73	5.86	4.62	1335	1	1.50	102	790	8	185	0.42	184	10	122

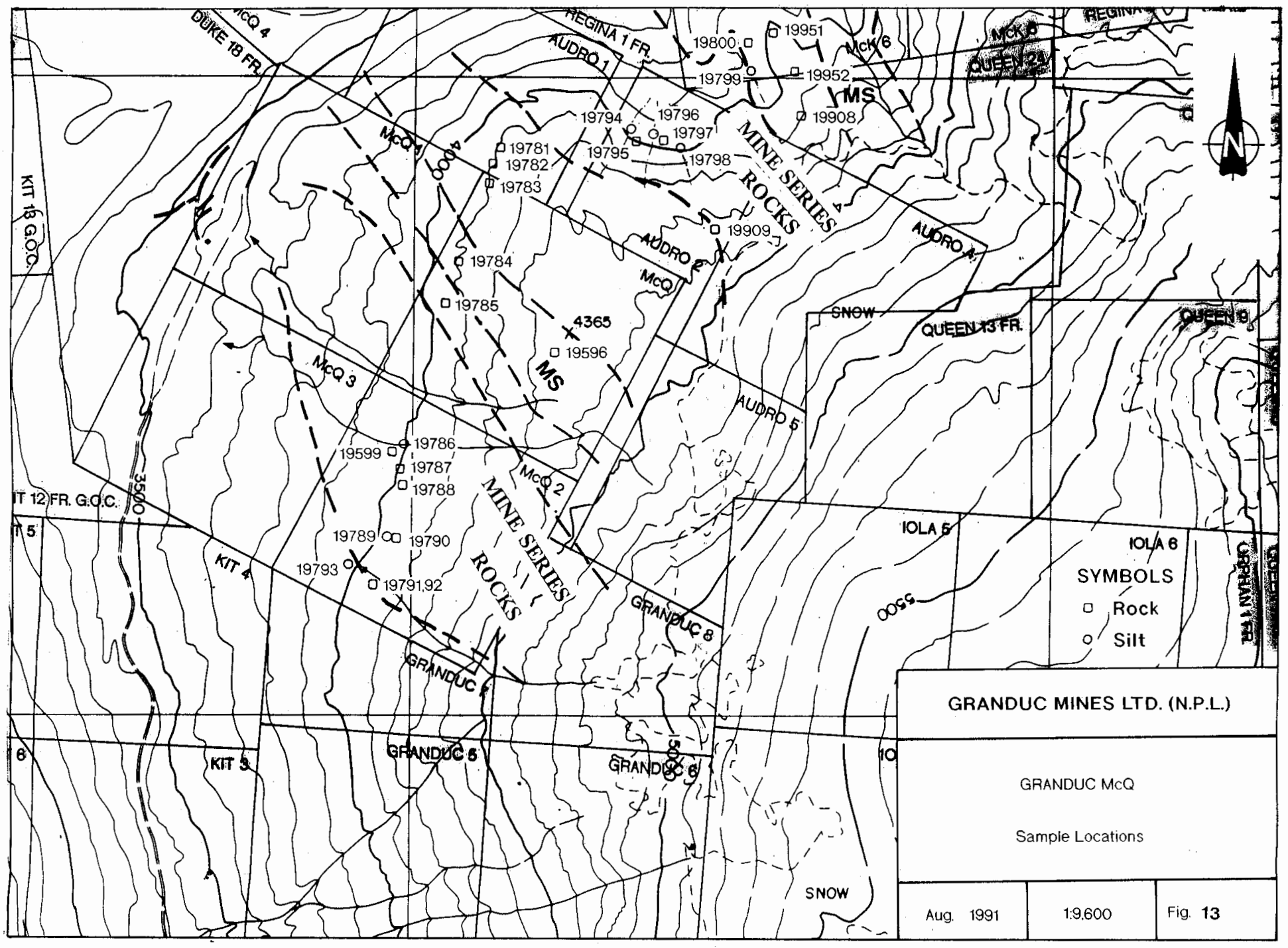


TABLE 7

GRANDUC MCQ AREA

GEOCHEMICAL ANALYSIS

Sample description	Au ppm FA+AA	Ag ppb AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn (ICP)
19786	<5	<0.2	640	<0.5	<2	0.5	22	171	189	5.36	2.61	1140	<1	2.14	60	940	20	332	0.47	171	10	102
19789	<5	<0.2	710	<0.5	<2	0.5	19	200	115	5.45	2.81	985	2	1.98	74	990	12	298	0.53	206	<10	112
19793	<5	<0.2	610	<0.5	<2	0.5	19	246	98	5.03	3.03	990	<1	1.93	77	940	8	315	0.46	176	<10	98
19794	<5	<0.2	460	<0.5	<2	0.5	20	172	130	5.89	4.57	1355	2	1.69	64	1030	46	174	0.45	194	<10	132
19796	<5	<0.2	740	<0.5	<2	<0.5	20	196	157	5.97	3.32	1310	1	1.69	64	1000	16	252	0.50	177	<10	124
19798	<5	<0.2	400	<0.5	<2	1.0	19	77	198	5.43	3.34	1065	2	2.09	39	1220	22	224	0.55	160	<10	118
19799	<5	<0.2	430	<0.5	<2	1.0	28	105	449	5.68	2.85	1015	2	2.42	44	1350	28	240	0.46	179	<10	132
19908	5	<0.2	130	<0.5	<2	<0.5	30	36	269	5.78	2.16	540	2	3.75	12	880	<2	423	0.48	255	<10	32
19909	<5	<0.2	40	<0.5	<2	<0.5	10	132	45	8.04	0.35	530	6	2.15	130	390	4	96	0.11	77	<10	16

Sample description	Au ppb FA+AA	Au FA oz/T	Ag ppm AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)
19596	<5		1.6	110	<0.5	<2	0.5	109	96	1505	19.00	0.98	320	21	0.20	477	170	4	36	0.08	154	<10	72
19599	<5		<0.2	770	<0.5	<2	<0.5	9	133	205	3.11	0.87	325	1	2.29	9	480	4	298	0.35	66	<10	56
19781	<5		<0.2	370	0.5	<2	0.5	31	623	99	6.42	6.57	1390	<1	1.89	187	860	<2	254	0.38	235	10	90
19782	<5		<0.2	320	<0.5	<2	0.5	24	432	99	5.86	5.18	1205	<1	2.07	130	840	<2	308	0.41	233	<10	76
19783	<5		<0.2	630	1.5	<2	0.5	12	84	55	4.75	2.33	945	<1	2.70	28	970	10	537	0.53	152	<10	98
19784	<5		<0.2	630	<0.5	<2	<0.5	17	384	57	5.65	4.87	1345	<1	1.50	87	890	<2	259	0.43	205	<10	90
19785	<5		<0.2	1160	2.0	<2	<0.5	8	101	59	4.36	1.98	855	1	2.02	21	1010	8	374	0.56	139	<10	84
19787	<5		<0.2	1310	1.0	<2	<0.5	10	70	26	4.12	1.52	620	<1	3.10	10	2050	20	786	0.71	86	<10	90
19788	<5		<0.2	290	<0.5	<2	0.5	29	842	53	6.17	8.16	1240	<1	1.06	216	730	<2	190	0.31	208	10	84
19790	<5		<0.2	820	0.5	<2	<0.5	9	97	62	5.34	2.57	1120	<1	2.99	17	1210	8	468	0.67	166	<10	88
19791	<5		<0.2	1220	1.5	<2	<0.5	10	80	28	3.69	1.61	515	<1	1.66	24	500	2	240	0.38	95	<10	64
19792	<5		<0.2	60	<0.5	<2	<0.5	14	170	4	4.47	1.80	855	1	2.92	95	1020	10	126	0.37	240	<10	104
19795	15		<0.2	10	<0.5	<2	<0.5	<1	96	62	>25.0	0.22	100	1	0.34	40	<10	4	14	0.01	<1	<50	38
19797	110		7.8	180	<0.5	<2	0.5	397	107	416	>25.0	0.56	200	2	0.45	74	630	256	22	0.09	190	<50	104
19800	20		2.8	80	<0.5	<2	13.0	184	87	3330	>25.0	1.04	745	1	0.04	124	150	76	12	0.04	34	<50	1750
19951	780		>100.0	10	<0.5	3620	5.5	9	196	>10000	>25.0	0.03	<5	<1	0.04	47	<200	>10000	2	<0.01	<1	<50	134
19952	650		24.2	20	<0.5	<20	45.0	258	45	>10000	21.1	3.17	1205	34	0.10	71	830	940	23	0.05	182	200	6040

The source area for the massive sulphide boulders was not discovered. The polymetallic nature of the massive sulphide boulders warrants further investigation.

D.4 Blend 2 Show

D.4.a Geology

The Blend 2 mineralized zone, Fig. 14 and Fig. 18, occurs at a structural contact, HFK fault, between andesite pyroclastic rocks and underlying andesite phyric flows of the lower footwall series. The mineralization is fault controlled and consists of chalcopyrite, pyrite, molybdenite, and magnetite hosted in a coarse crystalline quartz-calcite-epidote matrix.

Evidence to suggest an epigenetic origin is; 1) massive chalcopyrite in the breccia matrix contains molybdenite, 2) felsic dike clast in the breccia has a propylitically altered 2" reaction rim, 3) an unaltered felsic dike has sulphide filled tension gashes near the controlling mineralizing structure (HFK fault), 4) the presence of calc-silicate minerals in fractures and open spaces.

D.4.b Discussion of Results

A total of seven rock samples were collected from the showing. The geochemical results are presented in Table 8. Five rock samples contain anomalously high values up to;

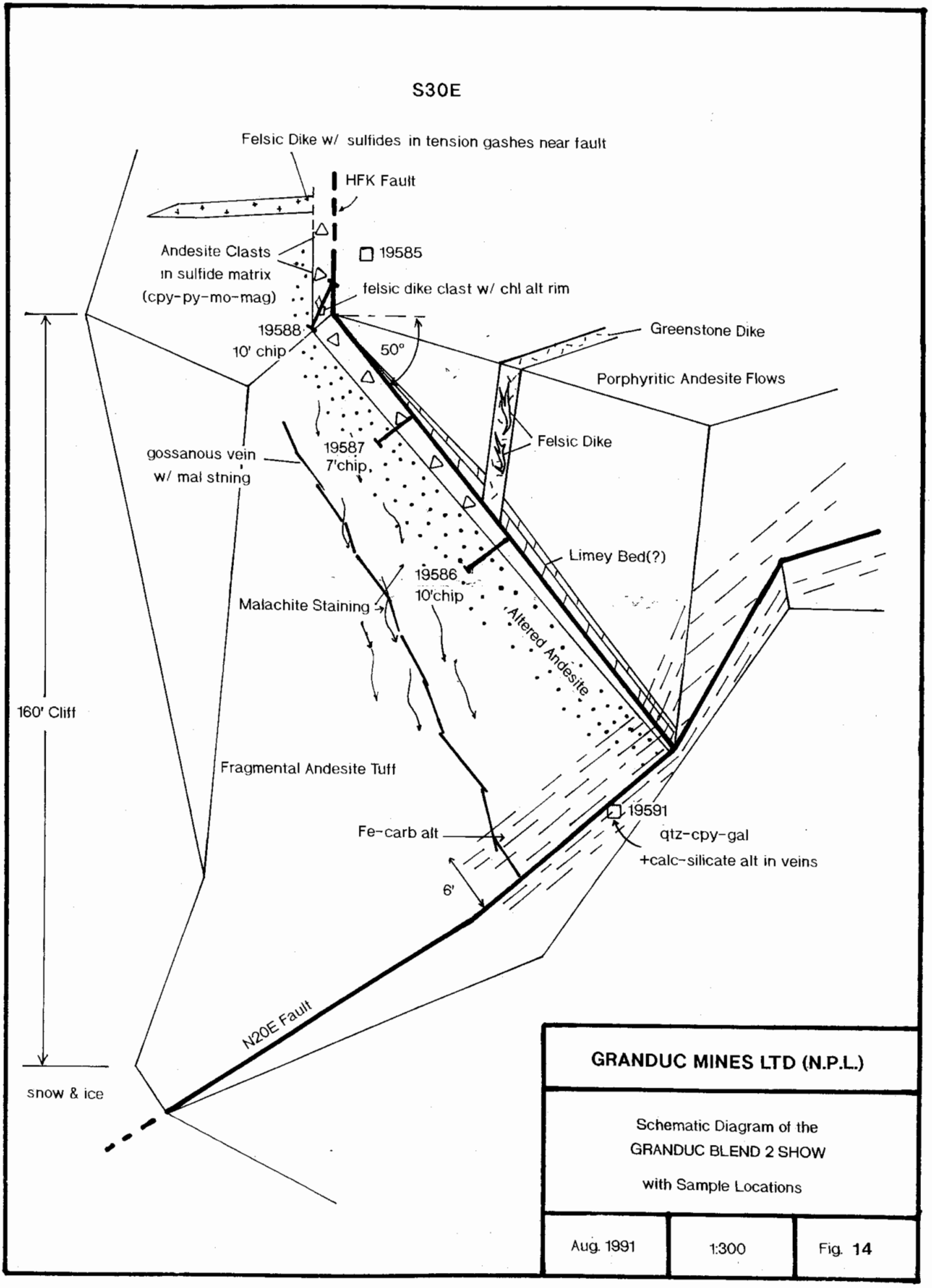

S30E
Felsic Dike w/ sulfides in tension gashes near fault
HFK Fault
Andesite Clasts
in sulfide matrix
(cpy-py-mo-mag)
19585
felsic dike clast w/ chl alt rim
19588
10' chip
50°
Greenstone Dike
Porphyritic Andesite Flows
Felsic Dike
gossanous vein
w/ mal stning
19587
7'chip
Limey Bed(?)
19586
10'chip
Malachite Staining
Altered Andesite
160' Cliff
Fragmental Andesite Tuff
19591
Fe-carb alt
qtz-cpy-gal
+calc-silicate alt in veins
6'
N20E Fault
snow & ice
GRANDUC MINES LTD (N.P.L.)
Schematic Diagram of the
GRANDUC BLEND 2 SHOW
with Sample Locations
Aug. 1991
1:300
Fig. 14

TABLE 8

BLEND 2 SHOW

GEOCHEMICAL ANALYSIS

Sample description	Au ppb FA+AA	Au FA oz/T	Ag ppm AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)
19585	<5		<0.2	360	1.5	<2	<0.5	23	172	13	1.05	0.06	25	2	4.48	5	40	4	62	0.03	2	<10	4
19586	610		46.0	130	<0.5	<20	2.5	118	501	>10000	13.55	3.61	1245	321	0.29	299	1840	12	82	0.16	134	150	70
19587	330		23.2	100	<0.5	<20	1.5	45	681	>10000	16.80	4.26	1440	225	0.31	329	3220	4	49	0.15	146	<50	212
19588	755		40.0	30	<0.5	<20	1.5	30	462	>10000	21.3	3.32	1065	884	0.19	415	4550	4	16	0.17	168	<50	240
19589	120		23.6	140	<0.5	<20	11.0	108	564	>10000	15.05	4.14	1705	92	0.28	335	2790	6	105	0.15	235	50	988
19590	<5		0.8	410	<0.5	<2	0.5	18	354	286	4.39	3.90	3410	4	0.27	107	410	384	244	0.11	138	10	160
19591	225		9.0	1590	<0.5	<2	1.5	23	256	3200	4.23	1.74	4490	377	0.13	161	1810	1760	238	0.06	124	20	124

BLEND2

> 10000 ppm Cu, 884 ppm Mo, 46.0 ppm Ag, and 775 ppb Au. The Blend 2 Show is an epigenetic vein-type mineral occurrence of limited economic potential. No further work is warranted on the Blend 2 Show.

D.5 JP-7 Claim

D.5.a Geology

A gossan zone occurs in a cirque at elevation 4500' ASL near the eastern boundary of the JP-7 claim (Fig. 15). Surface evaluation determined that the area is underlain by green mafic pyroclastics to the east, pyritic limy argillites and a foliated granodiorite to the west. The layered rocks strike northerly and dip uniformly 75 to 77° westerly. The argillites locally contain 5 to 10% disseminated pyrite over widths of up to 100 feet. The JP-7 claim stratigraphic section is believed to be part of the Granduc hanging wall series.

D.5.b Discussion of Results

Four rock chip samples, 19861 to 19864, were collected from the pyritic argillites and one sample, 19865, from foliated granodiorite. Geochemical results are presented in Table 9. The pyritic argillites contain background base and precious-metal values. The granodiorite contains weakly anomalous gold, 400 ppb, and background base metal values. No further work is warranted in this area based on geological observations and analytical data.

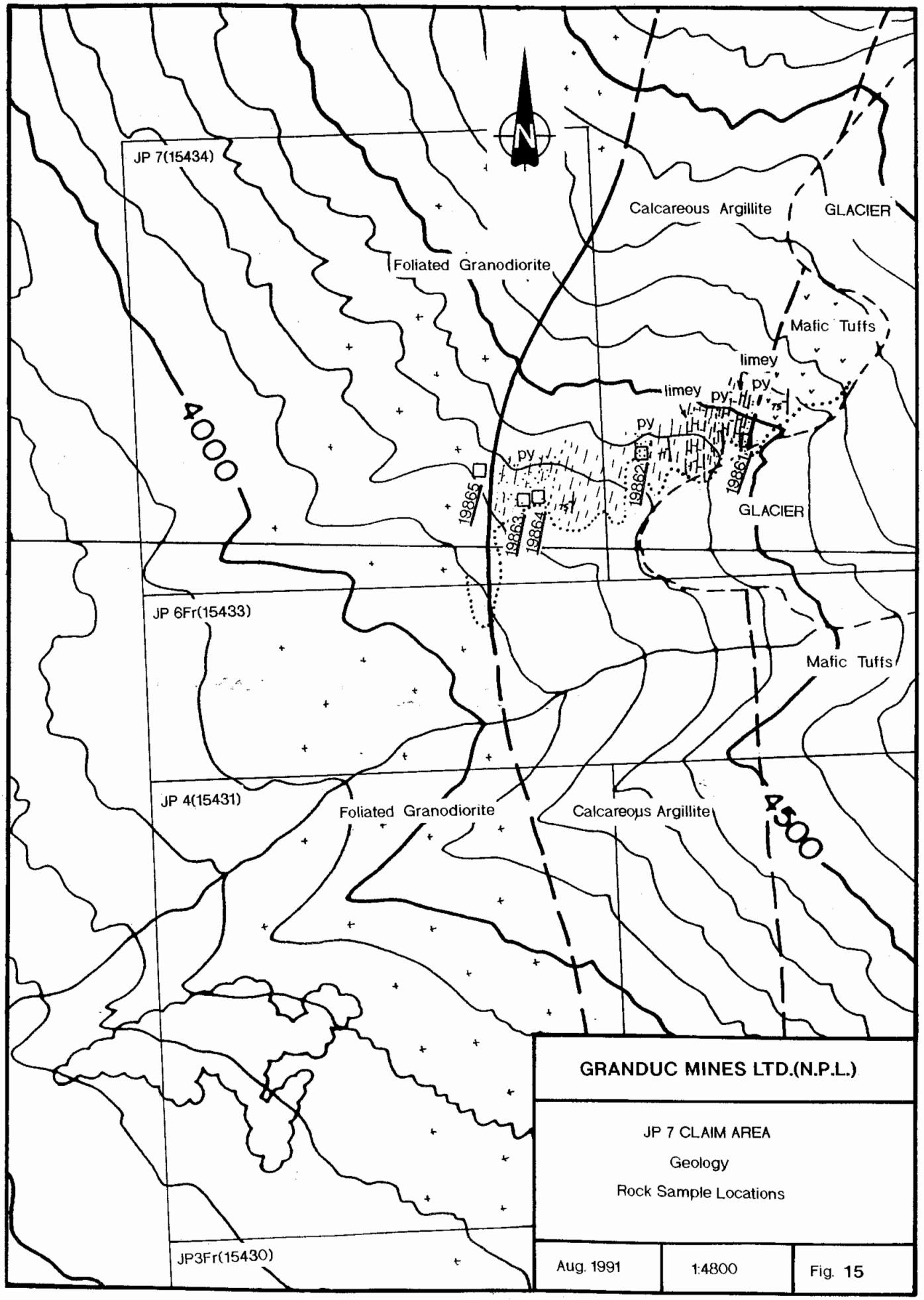

N
JP 7(15434)
Calcareous Argillite
GLACIER
Foliated Granodiorite
Mafic Tuffs
limey
py
limey
py
py
py
4000
19865
19863
19864
19862
19861
GLACIER
JP 6Fr(15433)
Mafic Tuffs
JP 4(15431)
Foliated Granodiorite
Calcareous Argillite
4500
JP3Fr(15430)
GRANDUC MINES LTD.(N.P.L.)
JP 7 CLAIM AREA
Geology
Rock Sample Locations
Aug. 1991
1:4800
Fig. 15

TABLE 9

JP-7 CLAIM AREA

GEOCHEMICAL ANALYSIS

Sample description	Au ppb FA+AA	Au FA oz/T	Ag ppm AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)
19861	<5		<0.2	1280	<0.5	<2	<0.5	14	45	35	5.92	1.27	790	2	2.20	13	1230	32	475	0.58	156	<10	96
19862	<5		<0.2	1780	<0.5	<2	0.5	13	71	64	4.67	1.37	830	<1	2.09	22	1380	38	628	0.40	150	<10	122
19863	<5		<0.2	910	<0.5	<2	<0.5	11	48	30	4.83	1.08	565	<1	1.86	13	1040	24	352	0.46	118	<10	96
19864	<5		<0.2	1090	<0.5	<2	<0.5	11	47	34	5.20	1.08	685	<1	1.84	12	1030	20	411	0.52	136	<10	94
19865	400		<0.2	1100	<0.5	<2	<0.5	9	57	163	3.13	0.87	445	<1	4.49	2	720	10	759	0.26	77	<10	56

JP7

D.6 Granduc Bob

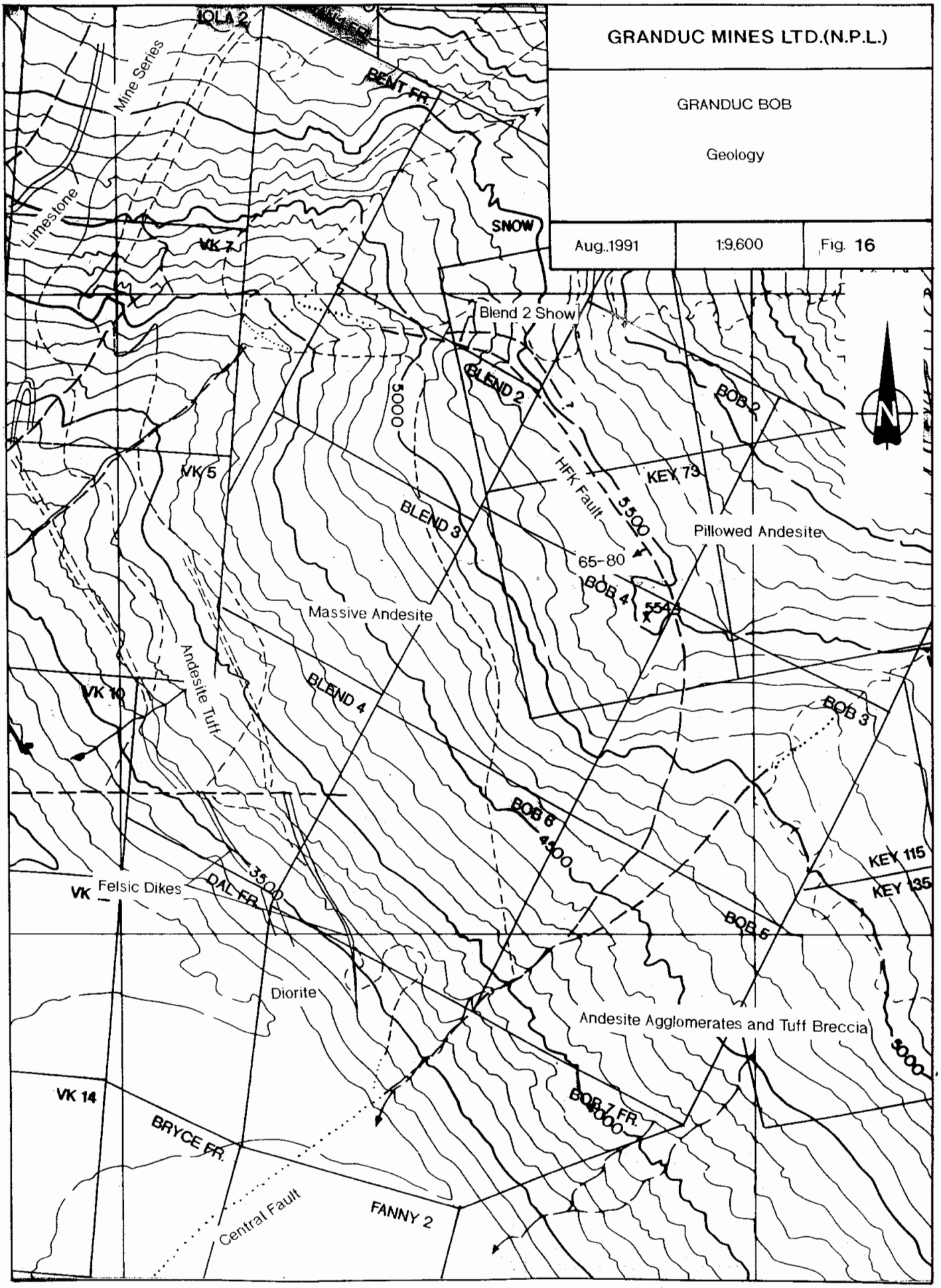
D.6.a Geology

The Granduc Bob area is centred approximately 4500 feet southeast of the Granduc Glory Hole. The area is underlain by massive and pillowed andesite, andesite agglomerate, and tuff breccia of the lower footwall series (McGuigan, 1980). Two prominent structures transect the area including, the Central and HFK faults (Fig.16). The HFK fault is host to several mineral occurrences including the Blend 2 Show.

D.6.b Discussion of Results

A total of fourteen rock samples, seventeen soil samples, and three sediment samples were collected and analyzed (Fig. 17, 18). The Blend 2 Show work is discussed in a separate section.

Samples 19832 and 19833 tested two shear zones 3'4" and 4' wide respectively. Both shears occur in mafic volcanics and are mineralized with chalcopyrite, pyrite, and pyrrhotite. The latter shear showed cobalt "bloom" and resulted in 132 ppm cobalt. Strongly anomalous values were obtained for gold, silver, copper, and zinc as follows: 0.028 oz/t, >100 ppm, >10000 ppm, and 2520 ppm respectively.


GRANDUC MINES LTD.(N.P.L.)
GRANDUC BOB
Geology
Aug.,1991
1:9,600
Fig. 16
IQLA 2
Mine Series
BENT FR.
Limestone
VK 7
SNOW
Blend 2 Show
BLEND 2
5000
BOB 2
VK 5
HFK Fault
KEY 73
BLEND 3
5500
Pillowed Andesite
65-80
BOB 4
5548
Massive Andesite
Andesite Tuff
VK 10
BLEND 4
BOB 3
BOB 6
4500
KEY 115
KEY 135
VK
Felsic Dikes
DAL FR.
3500
BOB 5
Diorite
Andesite Agglomerates and Tuff Breccia
5000
VK 14
BOB 7 FR.
BRYCE FR.
Central Fault
FANNY 2
N

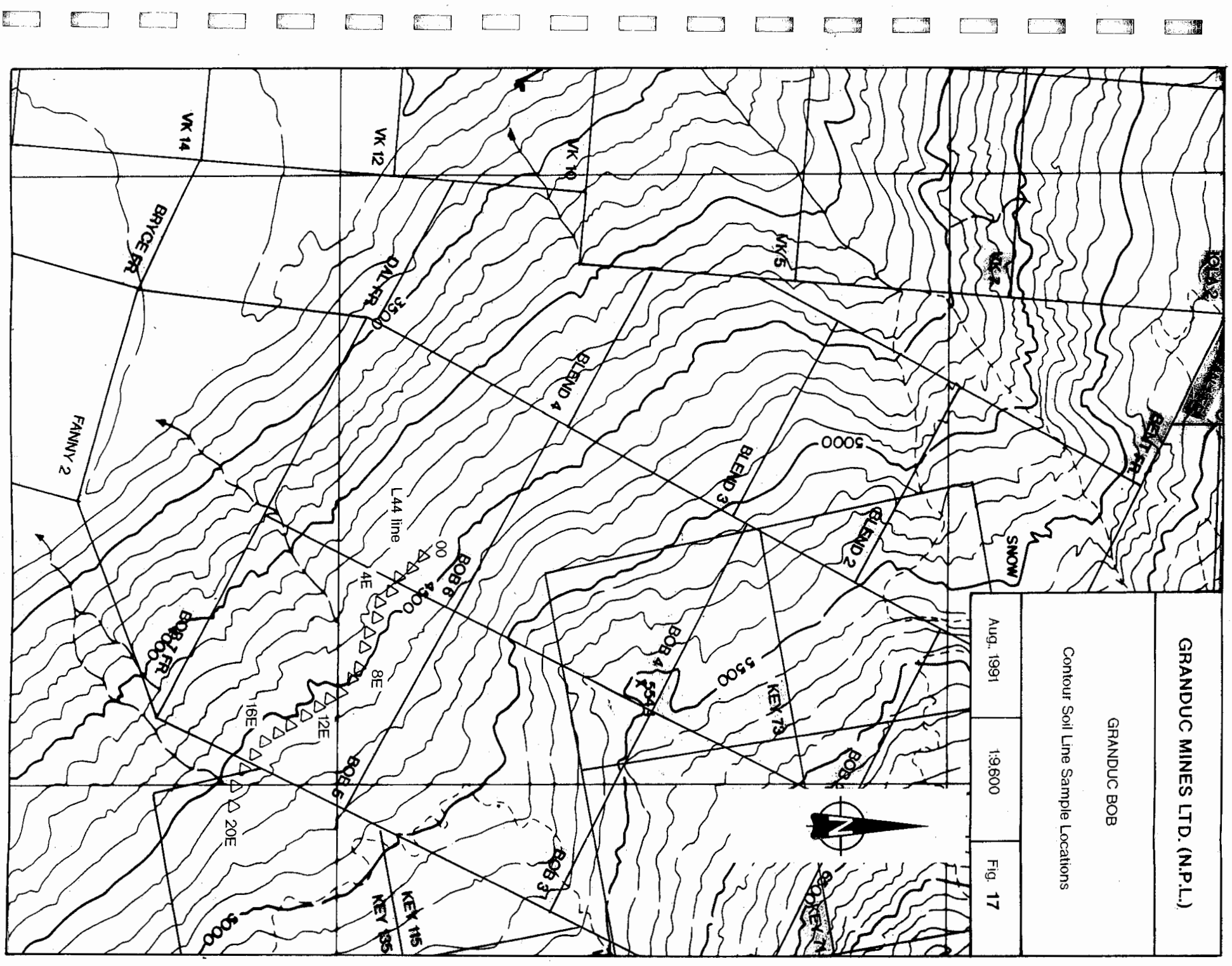
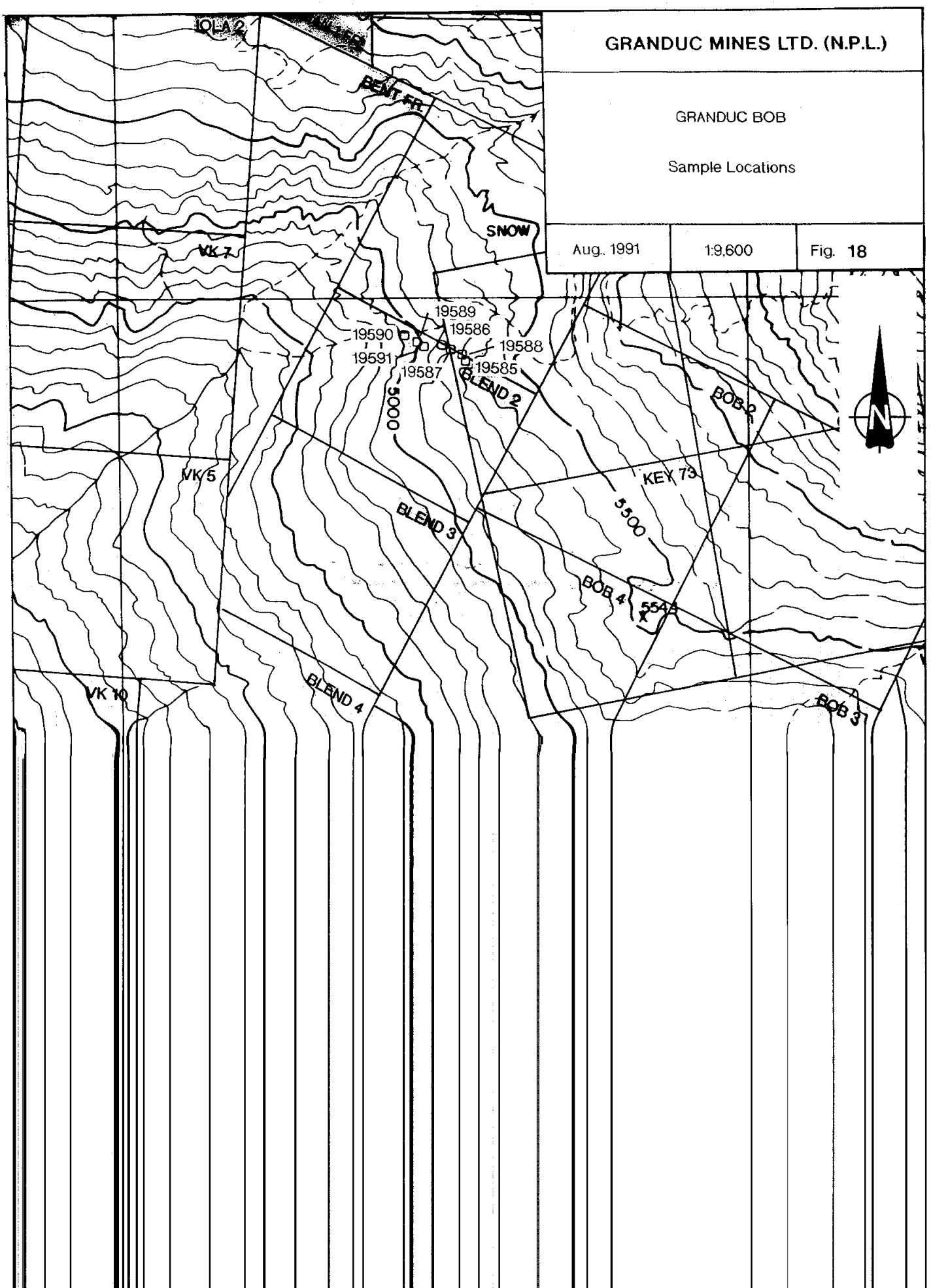


TABLE 10

Sample description	Au ppm FA+AA	Ag ppm AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)
L44 00E	<5	0.4	160	<0.5	<2	<0.5	16	492	136	5.54	5.15	1075	<1	0.92	149	1780	14	159	0.29	165	<10	106
L44 01E	<5	<0.2	180	<0.5	<2	<0.5	26	734	258	6.22	6.40	1280	<1	0.62	224	1730	16	111	0.29	185	<10	134
L44 02E	<5	0.4	190	<0.5	<2	<0.5	17	612	403	6.13	5.74	1165	<1	0.63	206	1480	28	124	0.28	167	<10	156
L44 03E	<5	<0.2	140	<0.5	<2	<0.5	20	854	338	6.57	6.11	1395	<1	0.47	227	910	20	115	0.26	157	10	148
L44 04E	410	3.6	200	<0.5	<2	1.5	44	884	4300	8.17	6.24	1740	2	0.50	253	1490	282	114	0.25	209	30	274
L44 05E	<5	<0.2	180	<0.5	<2	0.5	28	864	1105	7.19	7.39	1465	<1	0.56	284	910	28	108	0.29	198	10	166
L44 06E	<5	<0.2	120	<0.5	<2	<0.5	30	759	298	5.82	7.41	1230	<1	0.43	300	1050	4	91	0.24	165	<10	156
L44 08E	<5	<0.2	110	<0.5	<2	<0.5	34	540	354	4.63	12.65	1045	<1	0.29	716	210	12	46	0.17	104	<10	182
L44 09E	<5	<0.2	170	<0.5	<2	<0.5	25	1380	133	7.45	9.47	1410	<1	0.76	447	840	10	134	0.29	174	20	160
L44 10E	<5	<0.2	120	<0.5	<2	<0.5	27	947	81	6.58	12.15	1340	<1	0.43	615	390	<2	90	0.26	134	10	122
L44 11E	<5	<0.2	210	<0.5	<2	<0.5	26	732	212	6.89	9.10	1365	2	1.00	383	790	6	197	0.30	179	10	110
L44 12E	<5	<0.2	250	<0.5	<2	0.5	33	570	304	6.60	8.00	1350	<1	1.11	343	910	10	261	0.31	183	<10	106
L44 13E	<5	<0.2	200	<0.5	<2	<0.5	31	770	202	6.81	8.66	1280	<1	0.92	365	900	8	193	0.31	178	40	92
L44 14E	<5	<0.2	180	<0.5	<2	0.5	35	1005	180	7.06	9.38	1420	<1	0.84	440	790	8	160	0.32	173	10	110
L44 17E	<5	<0.2	140	<0.5	<2	<0.5	32	1070	194	7.24	8.93	1220	<1	0.72	410	750	8	140	0.30	172	10	100
L44 19E	<5	<0.2	120	<0.5	<2	<0.5	35	978	188	6.17	10.75	1265	<1	0.58	556	660	2	136	0.30	144	10	100
L44 20E	<5	<0.2	130	<0.5	<2	0.5	39	952	191	6.66	11.35	1320	<1	0.57	595	750	4	122	0.33	153	10	98


GRANDUC MINES LTD. (N.P.L.)
GRANDUC BOB
Sample Locations
Aug., 1991
1:9,600
Fig. 18
IOL A 2
BENT FR
SNOW
VK 7
19589
19586
19590
19588
19591
19587
19585
BLEND 2
5000
BOB 2
VK 5
KEY 73
BLEND 3
5500
BOB 4
55AB
VK 10
BLEND 4
BOB 3
N

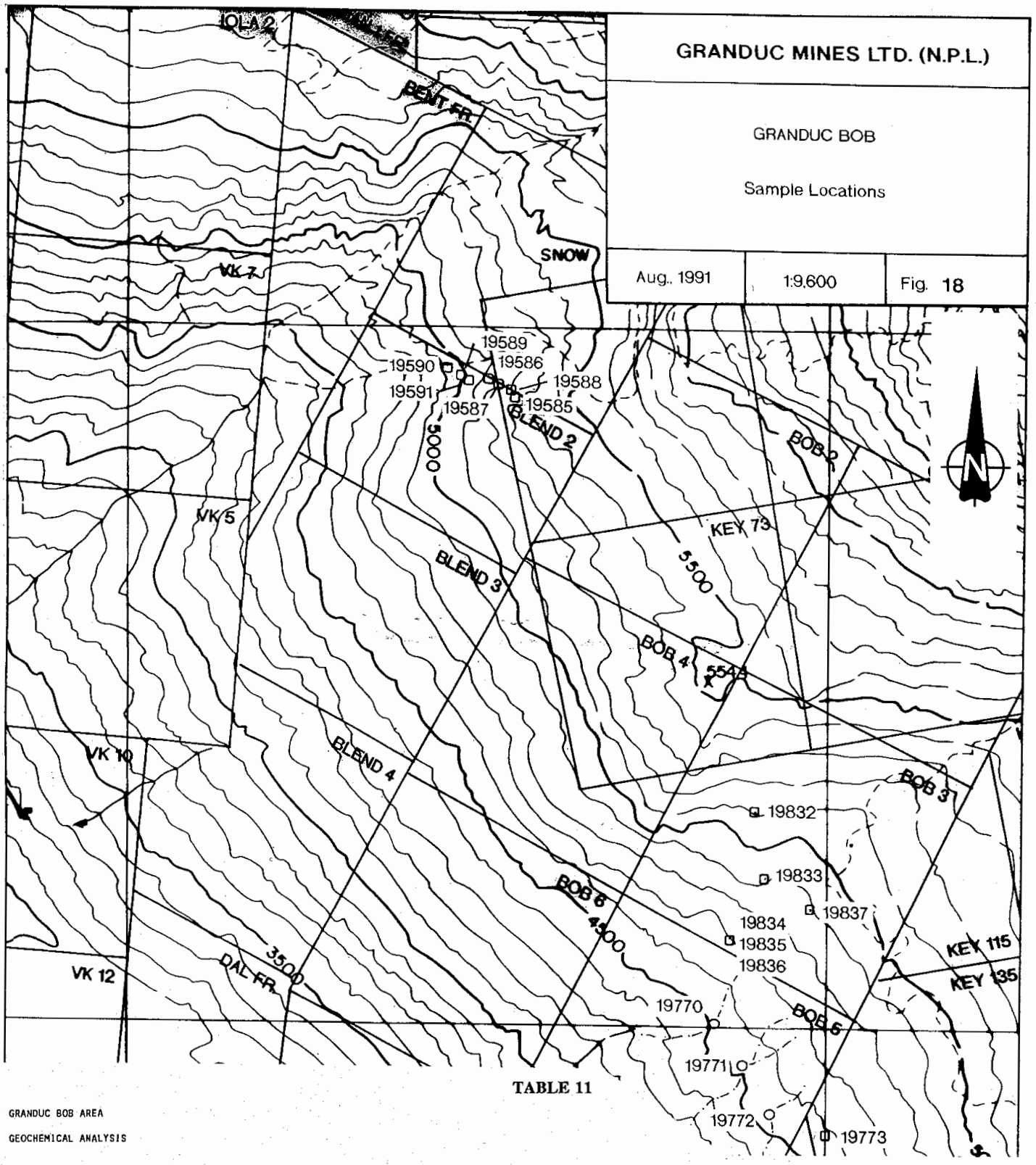


TABLE 11

GRANDUC BOB AREA

GEOCHEMICAL ANALYSIS

Sample description	Au ppm FA+AA	Ag ppb AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)
19770	230	<0.2	100	<0.5	<2	<0.5	27	1035	115	7.00	11.60	1255	<1	0.30	649	710	6	65	0.26	147	20	150
19771	15	<0.2	250	<0.5	<2	<0.5	43	1365	269	7.45	8.27	1320	<1	0.93	374	830	14	202	0.30	188	30	128
19772	15	<0.2	250	<0.5	<2	0.5	43	2000	223	8.03	8.90	1305	<1	0.65	454	760	12	189	0.30	184	50	152

Sample description	Au ppb FA+AA	Au FA oz/T	Ag ppm AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)
19832	20		2.4	310	<0.5	<2	0.5	16	1110	4010	8.02	10.30	1660	<1	0.48	503	1060	<2	15	0.27	174	30	220
19833	1130	0.028	>100.0	90	<0.5	<20	12.5	132	168	>10000	12.60	4.37	1150	2	1.14	638	4900	750	75	0.24	170	150	2520
19834	135		4.8	160	<0.5	<20	1.0	30	620	>10000	8.11	6.99	1050	<1	0.59	305	2920	<2	89	0.17	233	<50	106
19835	150		4.0	350	<0.5	<2	<0.5	31	606	3930	7.14	6.48	1020	4	1.35	260	1060	4	136	0.22	219	10	100
19836	290		7.8	140	<0.5	<20	1.5	57	773	>10000	7.71	7.40	1235	2	0.27	357	600	<2	67	0.20	219	50	204
19837	10		1.0	140	<0.5	<2	25.0	316	172	3400	>25.0	2.18	1665	215	0.96	193	240	18	981	0.28	587	50	1710

Samples 19834, 835, and 836 were collected across a 14 foot shear, mineralized with chalcopyrite and pyrite in quartz-sericite-pyrite altered andesite tuffs. Anomalous values were obtained for gold, silver, and copper from this zone. Gold varies from 135 to 290 ppb, silver varies from 4.0 to 7.9 ppm, and copper varies from 3930 to >10000 ppm.

A single line of soil samples was collected across the Central-HFK structure (Fig. 17). The geochemical results are uniformly low and except for sample L44-04E, do not exhibit any anomalous trends. Sample L44-04E resulted in weakly anomalous gold, silver, copper, lead geochemistry; 410 ppb, 3.6 ppm, 4300 ppm, 282 ppm respectively.

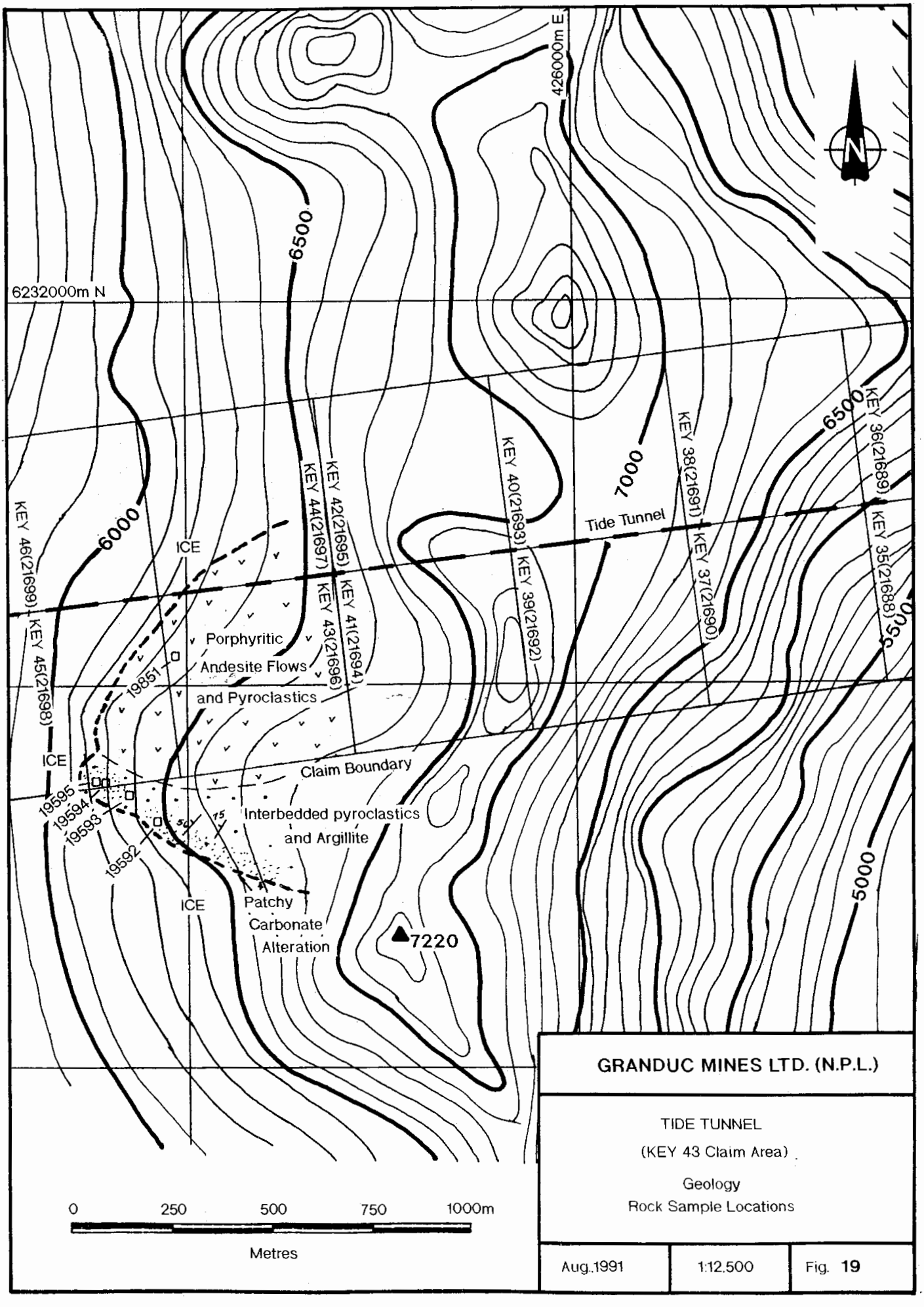
A massive sulphide float boulder, sample 19837, mineralized in magnetite, pyrite and weak chalcopyrite was submitted for analysis. Anomalous geochemical values were obtained in copper, molybdenum, cobalt, and cadmium as follows: 3400 ppm, 215 ppm, 316 ppm, and 25.0 ppm respectively.

Soil and rock geochemical sampling in the Granduc Bob area failed to detect economically significant mineralized zones.

D.7 Tide Tunnel (KEY 43 Claim)

D.7.a Geology

The KEY 4 claim area is underlain by a narrow zone of dacite crystal tuff interbedded with argillite, adjoining mafic flows and pyroclastics to the north (Fig. 19). The bedded



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TIDE TUNNEL

(KEY 43 Claim Area)

Geology

Rock Sample Locations

Aug.,1991	1:12,500	Fig. **19**

TABLE 12

TIDE TUNNEL (KEY 43 CLAIM)

GEOCHEMICAL ANALYSIS

Sample description	Au ppb FA+AA	Au FA oz/T	Ag ppm AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)
19592	<5		<0.2	320	<0.5	<2	<0.5	1	74	73	5.35	0.58	130	3	2.37	8	1420	14	633	0.56	205	<10	28
19593	30		<0.2	90	<0.5	<2	<0.5	18	183	146	8.12	1.64	355	20	>10.00	33	2740	42	904	1.09	487	<10	40
19594	<5		<0.2	1790	<0.5	<2	<0.5	9	19	112	5.68	2.77	1215	2	2.90	8	1530	6	822	0.46	218	<10	72
19595	<5		<0.2	870	<0.5	<2	<0.5	16	137	81	5.22	3.39	1055	<1	1.58	27	1400	6	552	0.32	179	<10	62

TIDETUNN

rocks strike southwesterly and dip 56 to 75° northwest. Patchy zones of quartz-carbonate and quartz-sericite-pyrite alteration occur coincident with the layered rocks.

D.7.b Discussion of Results

Four representative rock samples, 19592 to 19595, were collected and analyzed. The results are shown in Table 12. No significant base or precious-metal values were obtained.

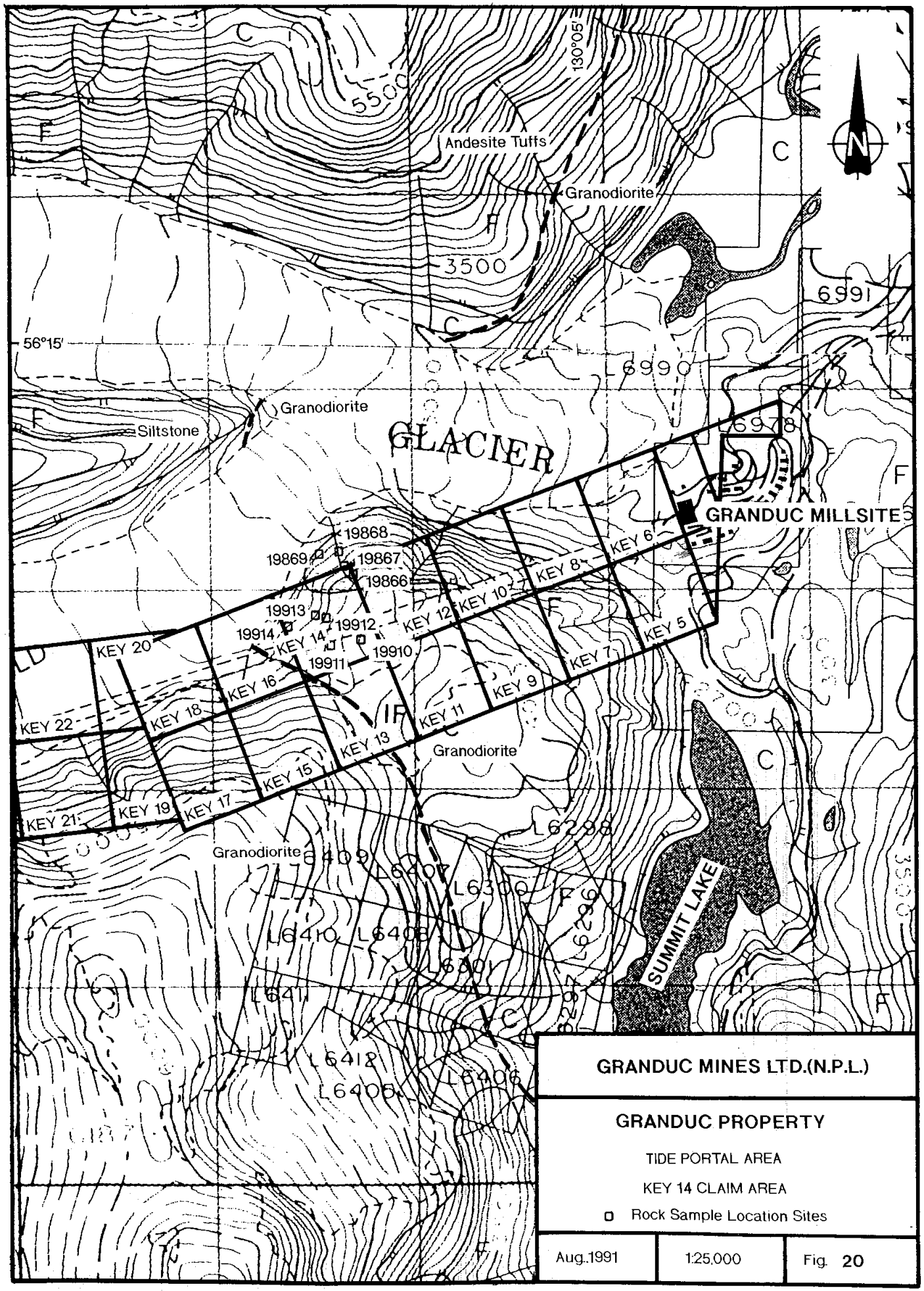
A narrow, three inch, quartz-sulphide vein hosted in phyric andesite flows was sampled, 19851, and analyzed. Weak, geochemically anomalous values in gold, silver, lead, and zinc were obtained as follows; 140 ppb, 1.4 ppm, 1230 ppm and 3700 ppm, respectively.

The KEY 43 claim area does not warrant further work.

D.8 Tide Portal Area (KEY 14)

D.8.a Geology

The Tide Portal area (KEY 14) is primarily underlain by a propylitically altered granodiorite locally silicified, adjoining hornfelsed siltstones to the north. Locally the granodiorite is intensely fractured, silicified, pyritized, and veined. Sulphide mineralization consists of disseminated pyrite, pyrrhotite, and trace chalcopyrite.



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GRANDUC PROPERTY

TIDE PORTAL AREA

KEY 14 CLAIM AREA

o Rock Sample Location Sites

Aug.,1991	1:25,000	Fig. 20

TABLE 13

TIDE PORTAL AREA

GEOCHEMICAL ANALYSIS

Sample description	Au ppb FA+AA	Ag ppm AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)
19866	40	<0.2	1360	<0.5	<2	<0.5	10	91	114	4.61	1.73	1095	3	3.02	14	1940	4	827	0.55	246	<10	46
19867	30	<0.2	1440	<0.5	<2	<0.5	11	108	74	4.77	1.94	1155	1	2.86	18	1820	<2	1060	0.50	219	<10	54
19868	50	6.0	20	<0.5	8	1.5	1	254	446	0.47	0.02	80	1	0.03	5	30	1060	23	<0.01	6	<10	190
19869	40	<0.2	780	<0.5	<2	<0.5	14	114	117	4.82	2.06	1205	1	3.09	22	2020	10	1175	0.54	245	<10	52
19910	105	<0.2	1620	<0.5	<2	<0.5	5	73	84	5.64	2.02	1420	<1	3.00	7	2060	<2	942	0.63	283	<10	56
19911	45	<0.2	1420	<0.5	<2	0.5	10	124	79	5.84	2.66	1585	<1	3.05	21	1990	<2	766	0.64	308	<10	90
19912	570	62.0	20	<0.5	<2	4.0	773	3	3350	>25.0	0.75	1015	2	0.19	184	40	144	24	0.01	10	<50	124
19913	10	1.0	180	<0.5	<2	0.5	3	110	108	7.32	2.00	765	7	4.34	27	1760	2	742	0.52	295	<10	36
19914	25	2.8	280	<0.5	<2	1.0	6	44	722	4.22	0.25	200	2	5.20	29	200	16	843	0.10	5	<10	124

TIDEPORT

Exploration work conducted by Esso Minerals had identified several intrusive hosted gold-bearing quartz veins in the Tide Tunnel assaying up to 2.44 oz/t Au across narrow widths.

D.8.b Discussion of Results

A total of nine rock samples were collected in the vicinity of KEY 14 claim (Fig. 20). Geochemical analysis indicates that anomalous concentrations of gold (10 to 570 ppb), silver (1.0 to 62.0 ppm), copper (to 3350 ppm), and lead (200 to 2060 ppm) occur in altered patches in the granodiorite.

Surface sampling did not identify new targets for future follow-up, however, the previous results obtained by Esso geologists in the Tide Tunnel warrant further investigation.

D.9 Ajax 4 Zone

D.9.a Geology

The AJAX 4 zone (Fig. 21) is located approximately 800 feet east of AJAX 4 claim and represents the most extensive zone of carbonate alteration in the Granduc Mountain area.

The area is underlain by intermediate tuffs, light grey and white chert, and chert breccia. The rocks are cut by thin quartz-carbonate veins mineralized with weak pyrite, chalcopyrite, and galena.

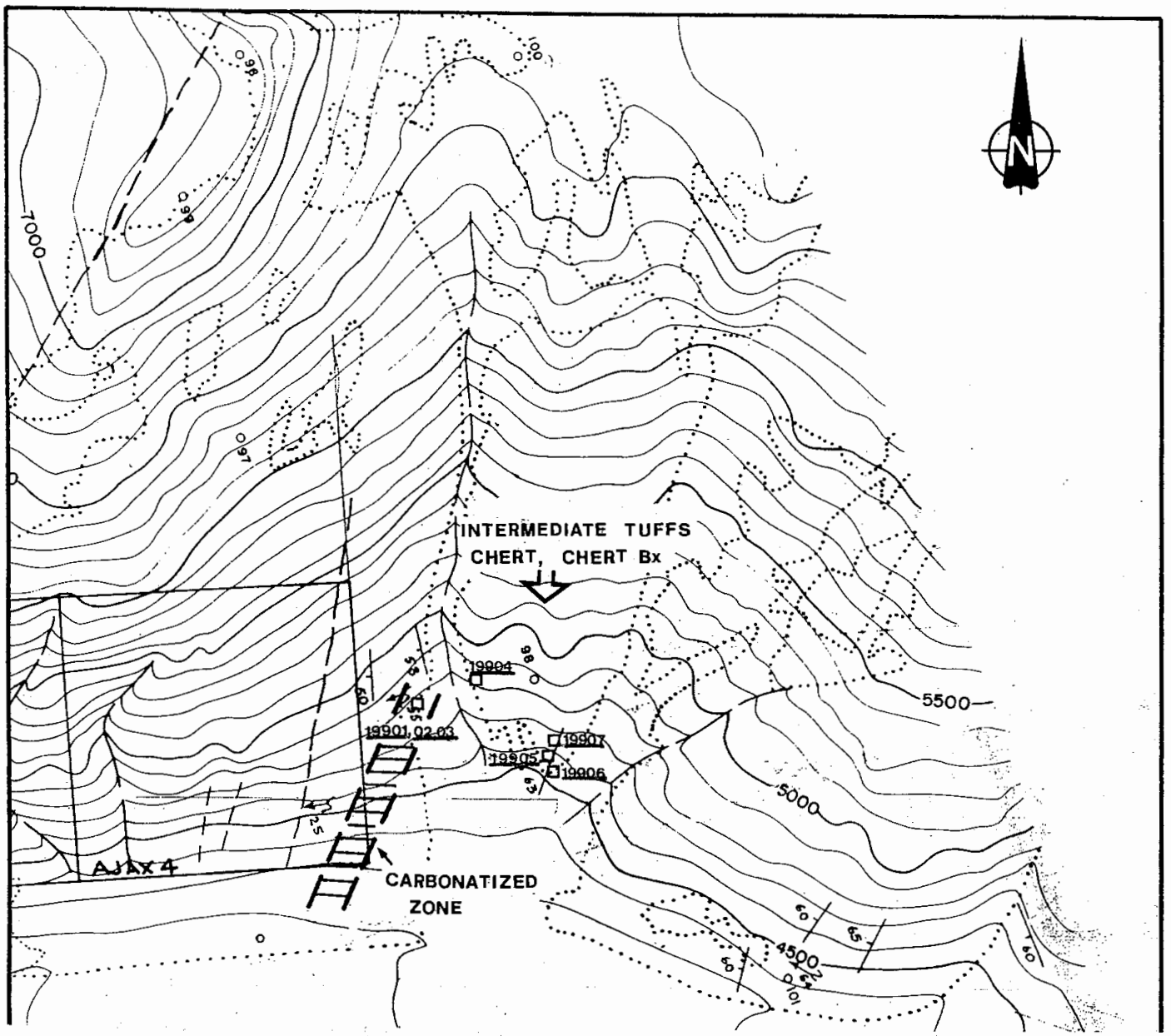
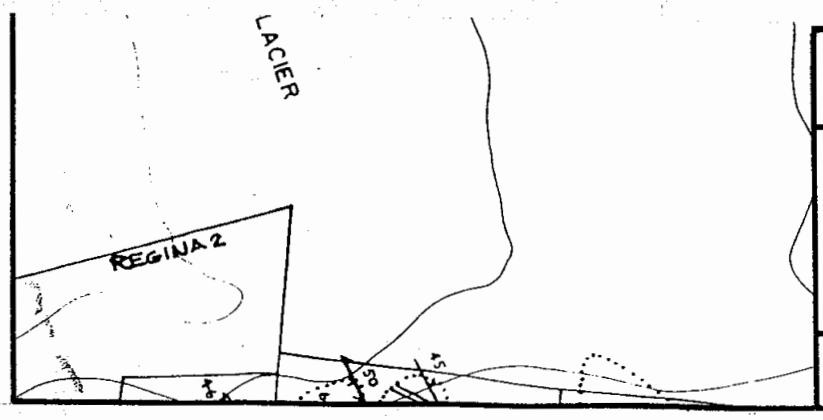


TABLE 14

AJAX CARBONATIZED ZONE

GEOCHEMICAL ANALYSIS

Sample description	Au ppb FA+AA	Au FA oz/T	Ag ppm AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Tl % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)
19901	<5		<0.2	1500	<0.5	<2	<0.5	15	21	219	5.08	1.22	1005	1	3.24	9	1610	8	403	0.35	172	<10	60
19902	<5		<0.2	920	<0.5	<2	<0.5	15	17	98	5.08	1.34	1110	1	2.27	6	1250	8	327	0.35	173	<10	72
19903	65		1.0	620	<0.5	<2	10.0	14	20	147	4.64	1.29	1665	<1	2.39	10	1090	710	273	0.30	146	<10	758
19904	<5		<0.2	1960	<0.5	<2	<0.5	1	95	6	1.12	0.23	85	1	1.56	1	100	14	152	0.09	<1	<10	28
19905	<5		<0.2	1990	<0.5	<2	<0.5	1	75	8	1.46	0.14	50	2	2.16	1	170	24	100	0.14	19	<10	12
19906	<5		<0.2	1870	<0.5	<2	<0.5	<1	80	3	1.30	0.10	80	4	2.24	1	80	20	99	0.11	<1	<10	12
19907	<5		<0.2	1360	<0.5	<2	<0.5	1	137	10	1.38	0.02	15	4	3.55	3	100	46	80	0.10	<1	<10	68



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AJAX 4 ZONE

Geology

Rock Sample Locations

Aug. 1991	1 : 9,600	Fig. 21

D.9.b Discussion of Results

A total of seven rock chip samples were collected (Fig. 21) from the alteration zone and submitted for 24 element ICP analysis. Only one sample, 19903, contained geochemically detectable concentrations of precious metals, 65 ppb gold, and 60 ppm silver. Remaining rock samples did not contain any significant base or precious metals.

No further work is warranted on this zone.

D.10 Dacite Area

D.10.a Geology

The Dacite area is located approximately 14,000 feet southeast of the Granduc Glory Hole (Fig. 3, 22). The rocks are dacitic to rhyodacitic in composition and consist of tuffs, lithic tuffs, flows, and minor chert pebble conglomerate. These rocks are thought to be mine series equivalent.

Sulphide mineralization consists of 2 to 10% disseminated pyrite.

D.10.b Discussion of Results

A total of five rock samples and one sediment sample were collected and submitted for analysis. Only one sample, 19776, was found to contain geochemically anomalous gold,

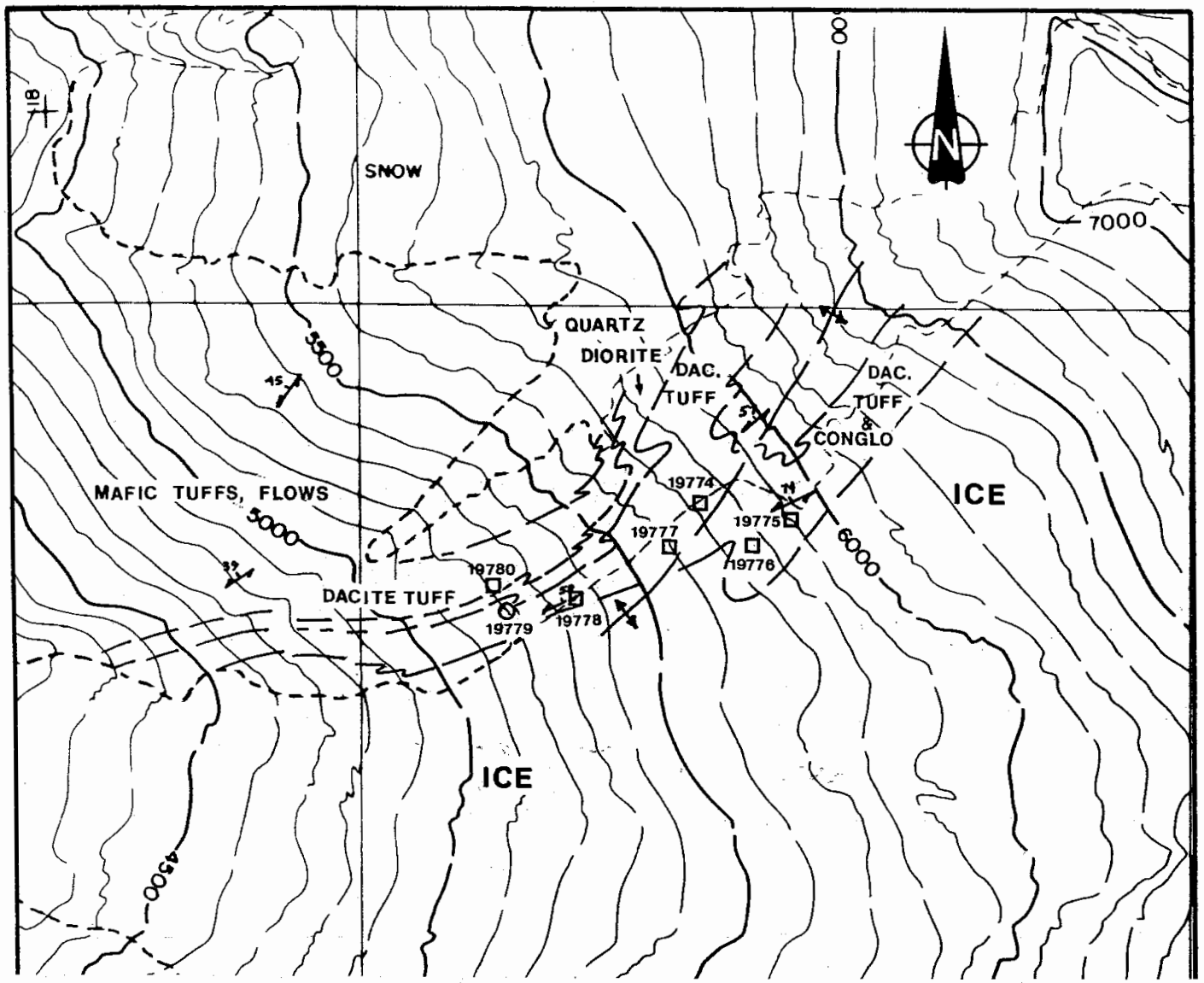


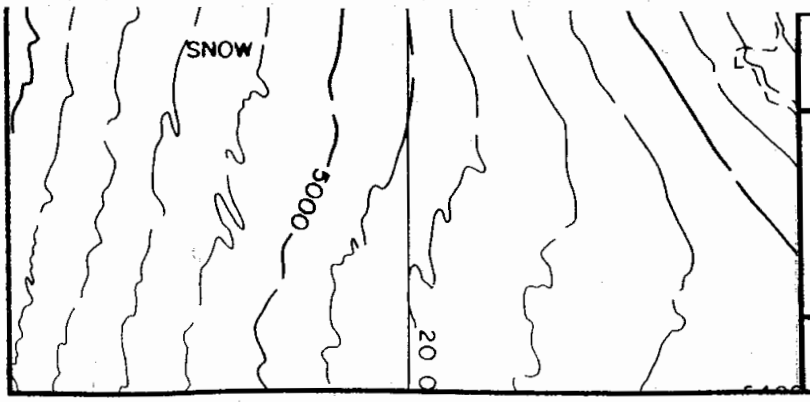
TABLE 15

DACITE AREA

GEOCHEMICAL ANALYSIS

Sample description	Au ppm FA+AA	Ag ppb AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)
19779	<5	<0.2	1290	<0.5	<2	0.5	21	97	73	5.36	2.06	1225	<1	1.66	38	1230	34	211	0.49	137	<10	118

Sample description	Au ppb FA+AA	Au FA oz/T	Ag ppm AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)
19774	<5		<0.2	370	3.0	<2	<0.5	18	87	135	6.95	1.70	645	<1	0.43	15	2410	10	158	0.63	229	<10	62
19775	15		0.4	660	0.5	<2	<0.5	6	45	26	3.83	0.92	500	<1	1.48	3	840	10	94	0.22	86	<10	40
19776	130		0.2	270	2.0	<2	<0.5	12	87	89	7.26	0.94	430	<1	0.34	16	1630	20	184	0.67	263	<10	42
19777	<5		<0.2	2050	0.5	<2	<0.5	4	34	62	3.65	1.02	485	<1	3.97	2	1520	24	181	0.35	76	<10	46
19778	<5		<0.2	2300	1.0	<2	<0.5	7	23	55	3.58	1.21	580	<1	3.81	3	1630	6	195	0.43	84	<10	44



GRANDUC MINES LTD.(N.P.L.)

DACITE AREA

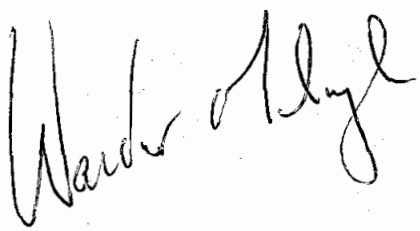
Geology

Rock Sample Locations

Aug. 1991	1 : 9,600	Fig. 22

130 ppb. Base metal values are at background levels. Samples 19777 and 19778 contain elevated barium values, 2050 and 2300 ppm respectively.

Based on analytical results obtained from the samples submitted, no further work is warranted in this area.



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APPENDIX A

LIST OF GRANDUC PROPERTY CLAIMS

GRANDUC CLAIMS AND CROWN GRANTS

CLAIM NAME	RECORD #	UNITS	ANNIVERSARY DATE	EXPIRY DATE
Ajax 001	16325	1	Sept 06/55	1994/09/06
Ajax 002	16326	1	Sept 06/55	1994/09/06
Ajax 003	16216	1	May 21/55	1994/05/21
Ajax 004	16217	1	May 21/55	1994/05/21
Ajax Fr.	16327	1	Sept 06/55	1994/09/06
Audro 001	L6597	1	Mar. 10/53	
Audro 002	L6596	1	Mar. 10/53	
Audro 003	L6593	1	Mar. 10/53	
Audro 004	L6595	1	Mar. 10/53	
Audro 005	L6594	1	Mar. 10/53	
Belle 003	L6621	1	July 21/53	
Bent Fr.	L6615	1	Aug. 22/54	
Blend 001	L6614	1	Sept 30/52	
Blend 002	L6613	1	Sept 30/52	
Blend 003	L6612	1	Sept 30/52	
Blend 004	L6611	1	Sept 30/52	
Blue 004	L6599	1	Apr. 17/53	
Bob 001	19701	1	May 11/61	1994/05/11
Bob 002	19702	1	May 11/61	1994/05/11
Bob 003	19703	1	May 11/61	1994/05/11
Bob 004	19704	1	May 11/61	1994/05/11
Bob 005	19705	1	May 11/61	1994/05/11
Bob 006	19706	1	May 11/61	1994/05/11
Bob 007 Fr.	19707	1	May 11/61	1994/05/11
Bryce Fr.	L6603	1	Aug. 20/53	
Dal Fr.	L6602	1	Aug. 20/53	
Duke 018 Fr.	19715	1	May 23/61	1994/05/23
Fanny 001	L6600	1	Aug. 20/53	
Fanny 002	L6601	1	Aug. 20/53	
Fred 001	20406	1	Jan. 23/62	1994/01/23
Fred 002	20407	1	Jan. 23/62	1994/01/23
Fred 003	20408	1	Jan. 23/62	1994/01/23
Fred 004	20409	1	Jan. 23/62	1994/01/23
Fred 005	20410	1	Jan. 23/62	1994/01/23
Fred 006	20411	1	Jan. 23/62	1994/01/23
Fred 007	20412	1	Jan. 23/62	1994/01/23
Fred 008	20413	1	Jan. 23/62	1994/01/23
Fred 009	20417	1	Jan. 23/62	1994/01/23

CLAIM NAME	RECORD #	UNITS	ANNIVERSARY DATE	EXPIRY DATE
Fred 010	20414	1	Jan. 23/62	1994/01/23
Fred 011	20415	1	Jan. 23/62	1994/01/23
Fred 012	20416	1	Jan. 23/62	1994/01/23
Granduc 001	L6573	1	July 31/54	
Granduc 002	L6574	1	July 31/54	
Granduc 003	L6580	1	July 31/54	
Granduc 004	L6579	1	July 31/54	
Granduc 005	L6581	1	July 31/54	
Granduc 006	L6582	1	July 31/54	
Granduc 007	L6588	1	Aug. 02/54	
Granduc 008	L6587	1	Aug. 02/54	
Granduc Fr.	L6570	1	Aug. 13/54	
Iola 001	L6578	1	Aug. 04/54	
Iola 002	L6577	1	Aug. 04/54	
Iola 003	L6583	1	Aug. 04/54	
Iola 004	L6584	1	Aug. 04/54	
Iola 005	L6586	1	Aug. 04/54	
Iola 006	L6585	1	Aug. 04/54	
J.P. 001	15428	1	Sept 21/53	1994/09/21
J.P. 002	15429	1	Sept 21/53	1994/09/21
J.P. 003 Fr.	15430	1	Sept 21/53	1994/09/21
J.P. 004	15431	1	Sept 21/53	1994/09/21
J.P. 006 Fr.	15433	1	Sept 21/53	1994/09/21
J.P. 007	15434	1	Sept 21/53	1994/09/21
Jetty 004	15052	1	Apr. 17/53	1994/04/17
Key 005	21658	1	May 27/63	1994/05/27
Key 006	21659	1	May 27/63	1994/05/27
Key 007	21660	1	May 27/63	1994/05/27
Key 008	21661	1	May 27/63	1994/05/27
Key 009	21662	1	May 27/63	1994/05/27
Key 010	21663	1	May 27/63	1994/05/27
Key 011	21664	1	May 27/63	1994/05/27
Key 012	21665	1	May 27/63	1994/05/27
Key 013	21666	1	May 27/63	1994/05/27
Key 014	21667	1	May 27/63	1994/05/27
Key 015	21668	1	May 27/63	1994/05/27
Key 016	21669	1	May 27/63	1994/05/27
Key 017	21670	1	May 27/63	1994/05/27
Key 018	21671	1	May 27/63	1994/05/27
Key 019	21672	1	May 27/63	1994/05/27

CLAIM NAME	RECORD #	UNITS	ANNIVERSARY DATE	EXPIRY DATE
Key 020	21673	1	May 27/63	1994/05/27
Key 021	21674	1	May 27/63	1994/05/27
Key 022	21675	1	May 27/63	1994/05/27
Key 023	21676	1	May 27/63	1994/05/27
Key 024	21677	1	May 27/63	1994/05/27
Key 025	21678	1	May 27/63	1994/05/27
Key 026	21679	1	May 27/63	1994/05/27
Key 027	21680	1	May 27/63	1994/05/27
Key 028	21681	1	May 27/63	1994/05/27
Key 029	21682	1	May 27/63	1994/05/27
Key 030	21683	1	May 27/63	1994/05/27
Key 031	21684	1	May 27/63	1994/05/27
Key 032	21685	1	May 27/63	1994/05/27
Key 033	21686	1	May 27/63	1994/05/27
Key 034	21687	1	May 27/63	1994/05/27
Key 035	21688	1	May 27/63	1994/05/27
Key 036	21689	1	May 27/63	1994/05/27
Key 037	21690	1	May 27/63	1994/05/27
Key 038	21691	1	May 27/63	1994/05/27
Key 039	21692	1	May 27/63	1994/05/27
Key 040	21693	1	May 27/63	1994/05/27
Key 041	21694	1	May 27/63	1994/05/27
Key 042	21695	1	May 27/63	1994/05/27
Key 043	21696	1	May 27/63	1994/05/27
Key 044	21697	1	May 27/63	1994/05/27
Key 045	21698	1	May 27/63	1994/05/27
Key 046	21699	1	May 27/63	1994/05/27
Key 047	21700	1	May 27/63	1994/05/27
Key 048	21701	1	May 27/63	1994/05/27
Key 049	21702	1	May 27/63	1994/05/27
Key 050	21703	1	May 27/63	1994/05/27
Key 051	21704	1	May 27/63	1994/05/27
Key 052	21705	1	May 27/63	1994/05/27
Key 053	21706	1	May 27/63	1994/05/27
Key 054	21707	1	May 27/63	1994/05/27
Key 055	21708	1	May 27/63	1994/05/27
Key 056	21709	1	May 27/63	1994/05/27
Key 057	21710	1	May 27/63	1994/05/27
Key 058	21711	1	May 27/63	1994/05/27
Key 059	21712	1	May 27/63	1994/05/27

CLAIM NAME	RECORD #	UNITS	ANNIVERSARY DATE	EXPIRY DATE
Key 060	21713	1	May 27/63	1994/05/27
Key 061	21714	1	May 27/63	1994/05/27
Key 062	21715	1	May 27/63	1994/05/27
Key 063	21716	1	May 27/63	1994/05/27
Key 064	21717	1	May 27/63	1994/05/27
Key 065	21718	1	May 27/63	1994/05/27
Key 066	21719	1	May 27/63	1994/05/27
Key 067	21720	1	May 27/63	1994/05/27
Key 068	21721	1	May 27/63	1994/05/27
Key 069	21722	1	May 27/63	1994/05/27
Key 070	21723	1	May 27/63	1994/05/27
Key 071	21772	1	June 26/63	1994/06/26
Key 072	21773	1	June 26/63	1994/06/26
Key 073	21774	1	June 26/63	1994/06/26
Key 074	21775	1	June 26/63	1994/06/26
Key 075	31544	1	July 14/67	1994/07/14
Key 076	31545	1	July 14/67	1994/07/14
Key 077	31546	1	July 14/67	1994/07/14
Key 078	31547	1	July 14/67	1994/07/14
Key 095	31564	1	July 14/67	1994/07/14
Key 096	31565	1	July 14/67	1994/07/14
Key 097	31566	1	July 14/67	1994/07/14
Key 098	31567	1	July 14/67	1994/07/14
Key 115	31584	1	July 14/67	1994/07/14
Key 116	31585	1	July 14/67	1994/07/14
Key 117	31586	1	July 14/67	1994/07/14
Key 118	31587	1	July 14/67	1994/07/14
Key 135	31604	1	July 14/67	1994/07/14
Key 136	31605	1	July 14/67	1994/07/14
Key 137	31606	1	July 14/67	1994/07/14
Key 138	31607	1	July 14/67	1994/07/14
Kit 002 Fr.	24256	1	Sept 04/64	1994/09/04
Kit 003	24248	1	Sept 04/64	1994/09/04
Kit 004	24249	1	Sept 04/64	1994/09/04
Kit 005	24250	1	Sept 04/64	1994/09/04
Kit 006	24251	1	Sept 04/64	1994/09/04
Kit 007 Fr.	24254	1	Sept 04/64	1994/09/04
Kit 009 Fr.	24255	1	Sept 04/64	1994/09/04
Kit 010	24252	1	Sept 04/64	1994/09/04
Kit 011	24253	1	Sept 04/64	1994/09/04

CLAIM NAME	RECORD #	UNITS	ANNIVERSARY DATE	EXPIRY DATE
Kit 012 Fr.	37119	1	Dec. 07/71	1994/12/07
Kit 013	37120	1	Dec. 07/71	1994/12/07
Kit 014	37121	1	Dec. 07/71	1994/12/07
Kit 015	37122	1	Dec. 07/71	1994/12/07
Kit 016	37123	1	Dec. 07/71	1994/12/07
Kit 017	37124	1	Dec. 07/71	1994/12/07
Leduc 001	20247	1	Nov. 16/61	1994/11/16
Leduc 002	20248	1	Nov. 16/61	1994/11/16
Leduc 003	20249	1	Nov. 16/61	1994/11/16
Leduc 004	20250	1	Nov. 16/61	1994/11/16
Leduc 005	20251	1	Nov. 16/61	1994/11/16
Leduc 007	20253	1	Nov. 16/61	1994/11/16
Leduc 009	20255	1	Nov. 16/61	1994/11/16
Leduc 011	20257	1	Nov. 16/61	1994/11/16
Marg 002	L6610	1	Mar. 10/53	
McK No. 005	15037	1	Apr. 15/61	1994/04/15
McK No. 006	15038	1	Apr. 15/61	1994/04/15
McQ	L6591	1	Aug. 15/51	
McQ 001	L6592	1	Aug. 15/51	
McQ 002	L6589	1	Aug. 15/51	
McQ 003	L6590	1	Aug. 15/51	
McQ 004	L6616	1	Aug. 24/53	
Orphan 001 Fr.	16024	1	Sept 17/54	1994/09/17
Orphan 002 Fr.	16025	1	Sept 17/54	1994/09/17
Portal 001	35741	1	July 13/70	1994/07/13
Portal 002	35742	1	July 13/70	1994/07/13
Portal 003	35743	1	July 13/70	1994/07/13
Queen 001	15545	1	Jan. 23/54	1994/01/23
Queen 002	15554	1	Jan. 23/54	1994/01/23
Queen 003	15555	1	Jan. 23/54	1994/01/23
Queen 004	15553	1	Jan. 23/54	1994/01/23
Queen 005	15552	1	Jan. 23/54	1994/01/23
Queen 006	15556	1	Jan. 23/54	1994/01/23
Queen 009	15541	1	Jan. 23/54	1994/01/23
Queen 010	15559	1	Jan. 23/54	1994/01/23
Queen 013 Fr.	15544	1	Jan. 23/54	1994/01/23
Queen 014 Fr.	15550	1	Jan. 23/54	1994/01/23
Queen 020	15546	1	Jan. 23/54	1994/01/23
Queen 024	15540	1	Jan. 23/54	1994/01/23

CLAIM NAME	RECORD #	UNITS	ANNIVERSARY DATE	EXPIRY DATE
Regina 001 Fr.	15975	1	Aug. 27/54	1994/08/27
Regina 002	15976	1	Aug. 27/54	1994/08/27
Rex 001	L6663	1	Aug. 24/54	
Rex 002	L6664	1	Aug. 24/54	
Rex 006 Fr.	L6658	1	Aug. 25/54	
Rex 007 Fr.	L6657	1	Aug. 25/54	
Rex 008 Fr.	L6656	1	Aug. 25/54	
Rex 009 Fr.	L6655	1	Aug. 25/54	
Rex 010 Fr.	L6654	1	Aug. 25/54	
Rex 011 Fr.	L6670	1	Sept 13/54	
Rex 012 Fr.	L6667	1	Sept 13/54	
Rex 013 Fr.	L6665	1	Sept 13/54	
Rex 014 Fr.	L6672	1	Sept 13/54	
Rex 015 Fr.	L6666	1	June 19/54	
Seabee 003	15068	1	Apr. 17/53	1994/04/17
Seabee 004	19708	1	May 11/61	1994/05/11
Seabee 005	15070	1	Apr. 17/53	1994/04/17
Seabee 006	19709	1	May 11/61	1994/05/11
Seabee 007	19714	1	May 23/61	1994/05/23
Seabee 008	19710	1	May 11/61	1994/05/11
Solar 008	L6598	1	June 08/53	
Sweet Marie 1	19700	1	May 11/61	1994/05/11
VK 009	L6566	1	Aug. 28/52	
VK 010	L6567	1	Aug. 28/52	
VK 011	L6565	1	Aug. 28/52	
VK 012	L6564	1	Aug. 28/52	
VK 013	L6562	1	Aug. 28/52	
VK 014	L6563	1	Aug. 28/52	
Vaughn K 1	L6619	1	Aug. 14/51	
Vaughn K 2	L6618	1	Aug. 14/51	
Vaughn K 3	L6620	1	Aug. 14/51	
Vaughn K 4	L6617	1	Aug. 14/51	
Vaughn K 5	L6568	1	Aug. 14/51	
Vaughn K 6	L6569	1	Aug. 14/51	
Vaughn K 7	L6576	1	Aug. 14/51	
Vaughn K 8	L6575	1	Aug. 14/51	

APPENDIX B

ROCK AND SEDIMENT SAMPLE DESCRIPTIONS

GRANDUC GLORY HOLE AREA

Rock and Sediment Sample Descriptions

Sample #	Type	Location	Description
19554	r	G.H. 40.75-0E	"20'chp,blk-wht, well fol-lam(2-5mm),intercalated arg & chert"
19555	r	G.H. 40.5-5.5E	"3'chp,dk gry-wht,fnly lam-well fol,calc,qtz-bio phyll+chert+diss py,cp-3%"
19556	r	G.H. 41-6E	"wht,mass-lam, chert w/ frac contrlled med gr cubic py"
19557	r	G.H. 41-8E	"4'chp,wht-gry, fnly lam chert w/ whispy clusters v.f.g. py"
19558	r	G.H. 41-8E	"flt, qtz-py vein w/ med-v. crs gr py in euhedral cubes 1-2"" vn"
19559	r	G.H. 41-8.5E	"lt gry,mass,-fnly lam, interc chrt-tffaceous chrt w/ fn gr po,mag,cp "
19560	r	G.H. 41-11.3E	"gry&wht, well fol calc-chlor-ser schst w/ 7-10% med gr cubic py"
19561	r	G.H. 41-7E	"10'chp,lam-mass,interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19562	r	G.H. 41-7E	"10'chp,lam-mass,interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19563	r	G.H. 41-7E	"10'chp,lam-mass,interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19564	r	G.H. 41-7E	"10'chp,lam-mass,interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19565	r	G.H. 41-7E	"10'cnp,lam-mass,interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19566	r	G.H. 41-7E	"10'chp,lam-mass,interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19567	r	G.H. 41-7E	"10'chp,lam-mass,interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19568	r	G.H. 41-7E	"10'chp,lam-mass,interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19569	r	G.H. 41-7E	"10'chp,lam-mass,interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19570	r	G.H. 41-7E	"10'chp,lam-mass,interc brwn-wht chrt+blk arg w/ diss

			py +/- cp,po"
19571	r	G.H. 41-7E	"10' chp, lam-mass, interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19572	r	G.H. 41-7E	"10' chp, lam-mass, interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19573	r	G.H. 41-7E	"10' chp, lam-mass, interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19574	r	G.H. 41-7E	"10' chp, lam-mass, interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19575	r	G.H. 41-7E	"10' chp, lam-mass, interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19576	r	G.H. 41-7E	"10' chp, lam-mass, interc brwn-wht chrt+blk arg w/ diss py +/- cp,po"
19577	r	G.H. 45-9E	"wht, well fol, v.f.g. chrty tff w/ fn gr brwn felsp phenos barren of sulfides"
19578	r	G.H. 45-7.8E	"med-dk grn, v.f.g.-aph, dacite-and tff w/ 3-5% fn gr py II to fol"
19579	r	G.H. 45-7.2E	"lt-dk gry,mod fol, fn-med gr diorite w/ minor fn gr py @ mafic sites"
19580	r	G.H. 45-6.3E	"gry,mass-well fol, dacitic xtal lithic tff, w/ diss py - 1%, minor qsp alt"
19581	r	G.H. 45-4.3E	"brnish gry, well fol, platey clvge, v. calc, py, volc wacke (?)"
19582	r	G.H. 45-4.1E	"wht,mass, chrt, w/ trace py, blky frac Fe stained"
19583	r	G.H. 45-1.6E	"dk grn, well fol, v.f.g. calc and tff w/ minor py along calc vns+ diss mag"
19584	r	G.H. 45-1E	"blk, well fol, graphitic, pyritic shst/phyllite, gossanous "
19751	r	G.H.41-5.6W	"gry, fn-med gr, wacke, local fnly lam sltstn-mdstn"
19752	st	G.H. 41-9.2W	"flt is wacke, and tuff+flows, qtz-carb rx, minor goss and cherty tuffite"
19753	r	G.H. 41-9.2W	"grab flt, qtz-carb rx w/ <5% py, tr cpy-bo(?) "
19754	st	G.H. 45-8.4W	"flt is sltstn, wacke, and tuff+flows, qtz-carb rx, and minor gossan"
19755	r	G.H. 45-8.4W	"grab flt, qtz-carb rx w/ 5-10% py, 1-2% mariposite"

19756	r	G.H. 45-8.4W	"thin bedded sltstn-wacke, 2-3% py, irreg purple patches (biotite?)"
19757	r	G.H. 45-8.4W	"grab flt, spongy qtz-carb rx/goss, py casts <5%"
19758	r	G.H. 45-6.8W	feld-phyric andesite or chl diorite dikes/dike 8/12/91
19759	r	G.H. 45-4.1W	"lam carb mudstn-sltstn, 4680' ASL"
19760	r	G.H. 45-4.1W	hblde-feld qtz monz dike (4')
19761	r	G.H. 45-1W	"dk grn meta sed w/3-5% cpy, 2-3% py, lam sugary qtz beds locally"
19762	r	G.H. 45-0.9W	chert-crty arg w/ mal+minor py
19763	r	G.H. 45-0.5W	"dk gry meta-seds w/lam sugary qtz bands, v fn diss py-cpy"
19764	r	G.H. 45-0.4W	"dk gry-grn meta-seds as above, un-mineralized, phyllonites(?)"
19765	r	G.H. 45-0.3W	micro-xtalline chert w/intercal carb seds
19766	r	G.H. 45-0.2W	"dk gry-grn meta-seds w/sugary qtz laminae, min and non-min zones"
19767	r	G.H. 45-0W	"high grade BIF w mag-cpy-py, 10' chip-chan"
19768	r	G.H. 45-0.5E	calc andesitic meta-sed and sed-bx HW to BIF
19769	r	G.H. 45-0.6E	"BIF w/mag-cpy-py and FW dark meta-seds, 10' chip-chan"
19801	r	G.H. 37-3E	"10' chp,gry-blk meta-sed/mafic tuff w/py,cpy,mal,azurite "
19802	r	G.H. 37-3E	"8' chp,And. crystal tuff calc. Tr. py, malachite"
19803	r	G.H. 37-3E	"17'chp,And. tuffs,biotite alt. minor cherty interbands,diss. py,whispy."
19804	r	G.H. 37-3E	"10'chp,cherty tuffs, only trace diss py."
19805	r	G.H. 37-3E	"15'chp,meta-seds biotite alt,calc,minor,diss py,patchs malachite."
19806	r	G.H. 37-3E	"12'chp,cherty tuffs,biotite alt,calc,tr. diss py, minor malachite"
19807	r	G.H. 37-3E	"20'chp,cherty tuffs, minor volc comp. alt to sericite, diss whispy py."
19808	r	G.H. 37-4E	"15'chp,cherty tuffs, minor sericite,diss and whispy v.f.g. py."

19809	r	G.H. 37-4E	"15'chp,cherty tuffs,minor sericite,diss and whispy v.f.g. py."
19810	r	G.H. 37-4E	"15'chp,cherty tuffs, minor sericite,diss and whispy v.f.g. py."
19811	r	G.H. 37-4E	"15'chp,cherty tuffs,minor sericite,diss and whispy v.f.g. py"
19812	r	G.H. 37-4E	"20'chp,cherty tuffs w/graphitic interbeds,wk.diss. py."
19813	r	G.H. 37-4E	"20,chp,cherty tuffs w/graphitic interbeds, diss py. minor biotite alt."
19814	r	G.H. 45-Lst	"17'chp,cherty tuffs w/biotite alt.,wk cpy and py."
19815	r	G.H. 45-Lst	"8'chp,wk py,cpy,in mine series cherty tuffs,locally biotite alt."
19816	r	G.H. 45-Lst	"15'chp,wk py,cpy,in cherty and graphitic tuffs,biotite,sil."
19817	r	G.H. 45-Lst	"15'chp,BIF,magnetite rich bands w/chert wk cpy,py, sil. biotite"
19818	r	G.H. 45-Lst	"15'chp,minor BIF,gry,blk chert w/interbed tuffs,biotite,chl."
19819	r	G.H.45-Lst	"15'chp,minor BIF,gry cherts,w/graphitic material,mal. chl.biotite"
19820	r	G.H. 45-Lst	"15'chp,minor BIF,gry cherts,w/mafic tuffs, biotite,local malachite"
19821	r	G.H.45-1E	"5'chp,BIF,interbed w/gry cherts,mag.,py,cpy, biotite"
19822	r	G.H. 45-1E	"10'chp,thinly bedded limey sed. w/minor cherty bands,v. wk. py."
19823	r	G.H. 45-1E	"15'chp,thinly bedded limey sed. w/inter andesitic tuffs v.wk. py.bio. chl."
19824	r	G.H. 45-1E	"15,chp,thinly bedded limey sed, w/inter. andesitic tuffs wk.py"
19825	r	G.H. 45-1E	"13'chp,limey sed. interbedded w/andesitic tuffs. biotite,chl. wk.py."
19826	r	G.H. 45-1E	"12'chp, BIF,massive,magnetite,minor cpy, grades to sil and. tuffs.8' True."
19827	r	G.H. 45-1E	"10'chp, biotitic meta-sed. sil. biotitic, malachite ,minor py. cpy. True 6'"

19828	r	G.H. 45-1E	"10'chp,biotitic meta-sed or tuffs, biotitic, wk py . cpy. mag."
19829	r	G.H. 45-1E	"10'chp,biotitic meta-sed or cherty tuffs, biotitic, wk py. cpy. malachite."
19830	r	G.H. 45-2E	"14'chp,blk.finely lam. cherts and mafic tuffs, sil.mod.py."
19831	r	G.H. 45-2E	"10'chp,v.f.g. py. in phyllites, biotite alt."

SOUTH GRANDUC ZONE

Rock Sample Descriptions

Sample #	Type	Location	Description
19838	r	S GRANDUC ZONE	"10'chp, chert peb. conglo.,malachite, chl,bio,hem. tr.cpy."
19839	r	S GRANDUC ZONE	"10'chp,chert peb. conglo.,minor cpy, hem. chl.bio.epidote"
19840	r	S GRANDUC ZONE	"10'chp, chert peb. conglo.,minor cpy,py , chl,bio,epidote"
19841	r	S GRANDUC ZONE	"10'chp, chert peb. conglo.,minor cpy,py,abundant hematite, chl,bio,epidote"
19842	r	S GRANDUC ZONE	"10'chp,chert peb. conglo., hematite, tr. py., chl. bio. epidote"
19843	r	S GRANDUC ZONE	"10'chp,chert peb. conglo.,hematite,py.,tr. cpy,chl.bio.epidote"
19844	r	S GRANDUC ZONE	"10'chp,And. tuff,banded,limey patchs,hematite,wk py.,cpy,chl,bio,epidote"
19845	r	S GRANDUC ZONE	"10'chp,And. tuff-conglo., hematite, wk.py, cpy, malachite, chl, bio, epidote"
19846	r	S GRANDUC ZONE	"10'chp,chert peb.conglo., hematite, wk.cpy, py., chl, bio, epidote"
19847	r	S GRANDUC ZONE	"10'chp,chert peb conglo., hematite, minor cpy, py., chl, bio, wk.epidote"
19848	r	S GRANDUC ZONE	"10'chp,chert peb conglo,hematite,tr. py,malachite,chl,bio"
19849	r	S GRANDUC ZONE	"10'chp,meta-sed, laminated, tuff,malachite,py,chl,bio."
19850	r	S GRANDUC ZONE	"10'chp,limey seds.,tuff component,malachite,bio,chl."
19852	r	S GRANDUC ZONE	"30'' Qtz vn , gal.5%,py.10%,tr. cpy.,ser.,py. alt halo"
19853	r	S GRANDUC ZONE	"5'chp,hanging wall alt halo above sample 19852. ser.,qtz.,bio."
19854	r	S GRANDUC ZONE	"10'chp,altered meta-volc/sed. py.,biotite,wk. ser."
19855	r	S GRANDUC ZONE	"10'chp,gry,white chert ,wk pyritic,rusty."

19856	r	S GRANDUC ZONE	"10'chp, meta-volc/sed, var.py., pyrrho., mag., shear, chl,bio,epidote"
19857	r	S GRANDUC ZONE	"7' chp, meta-volc., py., pyrrho. diss, whisps, chl, biotite"
19858	r	S GRANDUC ZONE	"2'chp, Qtz vn. gal.7%, cpy.5%, pyrite 10%, up to 4' wide. pinchs out 40'."
19859	r	S GRANDUC ZONE	"10'chp,meta-volc.,diss. py.,pyrrho.,shear related,bio,chl,ser.py."
19860	r	S GRANDUC ZONE	"FLOAT Qtz vn.,gal. 10%, spal.2%, cpy. 7%, py. 10%,pyrrhotite 5%."

GRANDUC MCQ AREA

Rock and Sediment Sample Descriptions

Sample #	Type	Location	Description
19596	r	McQ Claims	"high grade , 6""x4' sulfide lense with po,py,cp 30-80% in cherty tuff"
19599	r	M41-21W	"flt boulder, brwn, lam, chert w/ diss po+py+ tr cp "
19781	r	M 41 0-1W	"calc and tuff seds, characterizes 100' of section, tr fnly diss py, planer"
19782	r	M 41 1-1.75W	"calc and tuff seds, characterizes 75' of section, folding apparent"
19783	r	M 41 3.2-3.3W	"lam-thin bed chert and cherty tuff (w/ few sm qtz-eyes?), tr vfnly diss py"
19784	r	M 41 7.5-8W	"tan and gray banded sil tuff mdstn-sltstn-wacke, planer bedded"
19785	r	M 41 10.7 W	"dk brn and tan banded chert/cherty sltstn, planer bedded"
19786	st	M 41 20.5W	"flt is and tuff/tuff seds, and fls, and fl bx, minor qtz-carb rx and vn qtz"
19787	r	M 41 22.5W	"mass blocky cream colored qtz-monz(?) dike, Cret-Tert type"
19788	r	M 41 24.4W	"dk grn-blk and-basalt, blocky oc, fn gr to med gr locally, tr vfn diss py"
19789	st	M 41 28W	"flt is and tuff/tuff seds, and fls, minor qtz -carb rx and vn qtz"
19790	r	M 41 28W	"fissile tuff cherty seds, lt gry, vfn gr, tr fnly diss py"
19791	r	M 41 32W	"dk-med gry lam chert, 1-2% py fnly diss and in bands/beds"
19792	r	M 41 32.2W	"dk grn-blk and(?), strly def w/ smeared sulf, bxiated w/qtz-filling stkwks"
19793	st	M 41 32W	"flt is and tuff/tuff seds, and fls, arg chert, minor qtz-carb rx and vn qtz"
19794	st	3960' ASL Nzn	"flt is wide variety of and tuff/flows, and seds, arg, lms"
19795	r	3960'ASL Nzn	"grab flt qtz-ser-py rx, alt and(?) or felsic tuff, massive and semi-mass py"

19796	st	3940' ASL Nzn	"flt is largely lam arg, and tuff seds, lam arg chert, lesser and tuffs/flows "
19797	r	3960' ASL Nzn	felsic tuff w/ 10-15% diss py and mass py bands up to 2''
19798	st	3980' ASL Nzn	"flt is and tuff, tuff seds, lms, cherty seds"
19799	st	3920' ASL Nzn	flt is andesite seds and tuffs covered w/ glac flour-hard to see
19800	r	3940' ASL Nzn	"mass po w/1% cpy, host is felsic tuff as in previous samp 19797"
19908	r	McQ Cirque	"dk grnish gry,mass,fn-med po,py,+tr cpy"
19909	r	McQ Cirque	" 3 ' c h p , t a n , t h i n bdd-lam,chrt+interc tff flsic rk+5% diss med gr py tr cp"
19951	r	4020' ASL Nzn	"grab flt 3"" qtz vn w/ 60% py, 5% cpy+gal(1%), 35% qtz"
19952	r	4080' ASL Nzn	"grab flt, 8"" thick semi-mass cpy+mag, cpy 40%, mag 40%, chl+qtz 20%"

BLEND 2 SHOW

Rock Sample Descriptions

Sample #	Type	Location	Description
19585	r	Blend 2 Show	"wht, leucocratic, med gr equigr, hem (after mag), gran dike+trace cp"
19586	r	Blend 2 Show	"10'chp,dk gry-grn,mass-well fol,pillow baslt+ mass cp+mal on frac"
19587	r	Blend 2 Show	"7'chp,dk grn-gry,mass mag baslt w/ strngers(?) mass cp + diss mo? co?"
19588	r	Blend 2 Show	"10'chp,mass cp in matrx of crse frag bslt up to 30% cp+diss mo"
19589	r	Blend 2 Show	mag-carb-cp rock w/ CuO staining along limey bed(?) mass bslt contact
19590	r	Blend 2 Show	"8'chp,qtz carb alt+stkwk vning+py+ cp, wht & crwn calcite predom vn "
19591	r	Blend 2 Show	"brwn & grn,mass,fin gr, equigr, calc-sil vein w/ diss cp,mo,gal, "

JP-7 CLAIM AREA

Rock and Sediment Sample Descriptions

Sample #	Type	Location	Description
19861	r	JP-7 CLAIM	"20'chp,graf. arg./siltst. banded ,py.,pyrrho.5%,bio.alt."
19862	r	JP-7 CLAIM	"20'chp,hornfelsed arg.,pyrrho.2-3%,vnlets,bio"
19863	r	JP-7 CLAIM	"15'chp,hornfelsed arg.,pyrrohtite 1-3%, bio. "
19864	r	JP-7 CLAIM	"15'chp,hornfelsed arg,,pyrrho. vnlets 1-3%. "
19865	r	JP-7 CLAIM	"5'chp,fol.granodiorite.,diss py 2%, bio.,chl. alt. "

GRANDUC BOB AREA

Rock and Sediment Sample Descriptions

Sample #	Type	Location	Description
19770	st	L 44-10E	"flt is porph and fl bx and fls, bslt, qtz-carb rx(minor), and mag-bear dior"
19771	st	L 44-13.7E	"flt is porph and fl bx and fls, bslt, pillow and, qtz-carb rx(minor)"
19772	st	L 44-16E	flt is porph and fls and fl bx
19773	r	L 44-19E	"qtz-ser-py alt andesite or felsic tuff w/10-15% py, tr mariposite"
19832	r	HFK Fault	"3'4"" shear in mafic vols. cpy 1%, py 5%, hematite, chl. carb. alt"
19833	r	HFK Fault	"4' shear in mafic vols, cpy 1-2%, py 5%, pyrrhotite, cobalt bloom."
19834	r	HFK Fault	"5' sample 14'shear? in augite tuff. py. cpy. may be stratiform, chl, ser. "
19835	r	HKF Fault	4' sample adjoins above sample. minor py. cpy.
19836	r	HKF Fault	"5' sample adjoins above sample, cpy,py,qtz,calcite veinlets, biotite."
19837	r	HKF Fault	"Float,80% magnetite,pyrite, cpy,minor,chl,epidote"

TIDE TUNNEL (KEY 43 CLAIM)

Rock Sample Descriptions

Sample #	Type	Location	Description
19592	r	E. Frank Mackie	"grnish gry,mass,fn-med gr ser-py alt dacite(?) xtal tuff w/ diss py - 1%"
19593	r	E. Frank Mackie	"gry,mass, porph-fn gr, fragmental qsp alt dacite/and xtal tff py 20-30%"
19594	r	E. Frank Mackie	qsp alt dacite/and xtal lithic tuff from small 10'x20' Fe stained area
19595	r	E. Frank Mackie	"lt gry,mass,qtz-carb alt frgmntal w/ 10% subrnded-anglr chert frags"
19851	r	E. Frank Mackie	"3" assay,Qtz vn,tr. gal.,sphal.,cpy.,in andesite,wk.py alt. elev. 6360'"

TIDE PORTAL AREA

Rock and Sediment Sample Descriptions

Sample #	Type	Location	Description
19866	r	Tide Lake Area	"10'chp, Altered Grano. 3% diss po. v.f.g. sil.,Elev. 4000'"
19867	r	Tide Lake Area	"10'chp,Altered Grano. 3% v.f.g. po. diss. sil. Elev. 3900'"
19868	r	Tide Lake Area	"12"" Qtz vn., irregular,w/wk cpy, py, gal, patchy mineralization."
19869	r	Tide Lake Area	Rep.chp. Sil grano. or hornfels seds. 3% po. elev.3500'.
19910	r	Tide Lake Area	" r d - b r n grnish-gry,mass,porph-aph fn gr prop alt granodio+diss py,po"
19911	r	Tide Lake Area	"grnish-gry,mass,hghly frac,Fe stned py (1%) prop alt granodio porph"
19912	r	Tide Lake Area	"high grade, massive pyrrhotite vein, 1'x8' lense in granodiorite"
19913	r	Tide Lake Area	"prop alt, fn grn diorite dike? w/ diss fn gr py"
19914	r	Tide Lake Area	"high grade, 2' qtz-sulfide vn,in dior, w/ cp on frac + diss py+tr sph"

AJAX 4 CARBONATIZED ZONE

Rock and Sediment Sample Descriptions

Sample #	Type	Location	Description
19901	r	C.B. Zone	"10' chp, orange-brwn, Fe-carb alt volc, + trace diss py"
19902	r	C.B. Zone	"10'chp,lt gray, fnly lam, carb-ser alt int tuff w/ sparse clusters fn gr py"
19903	r	C.B. Zone	"10'chp,lt gry-brwn, qtz-carb-py alt inter. volc w/ 1"" qtz-cp-gal vns+py"
19904	r	C.B. Zone	"20'chp,lt gry-blk-wht,mass clast suprtd chrt bx rndd-ang clsts+py on frac"
19905	r	C.B. Zone	"40'chp,blk&wht chrt,mass,chrt bx, clst suprtd w/dk gry-blk mtrx+py "
19906	r	C.B. Zone	"100' chp grab,predom lt gry&wht chrt bx+qtz stkwk+fn diss py+ser+rhy"
19907	r	C.B. Zone	dk gray bx chrt w/ v.f.g. diss py to 10%

DACITE AREA

Rock and Sediment Sample Descriptions

Sample #	Type	Location	Description
19774	r	5800' ASL Dac	dacite tuff w/ 2-3% py in foliation planes
19775	r	5900' ASL Dac	"dacite tuff bx/lithic tuff, 1-2% py, lithic frags 40-50% w/ 3-5% py"
19776	r	5970' ASL Dac	qtz-ser schist w/ 5% py sructurally (strat?) overlies chert pebble cong
19777	r	5580' ASL Dac	"dacite tuffs/flows (rdac-rhy?) w/ 5-10% py locally, minor po"
19778	r	5350' ASL Dac	"dacite flows/tuffs (rdac-rhy?) w/ 5-10% py locally, minor po"
19779	st	5330' ASL Dac	"flt is dac, and, pebble cong, and argillite; somple from small pond w/ silt"

APPENDIX C

ANALYTICAL RESULTS, ROCK, SOIL, AND SEDIMENT

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers

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British Columbia, Canada V7J 2C1
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To: HECLA MINING COMPANY

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1112 GLACIER AVE.
JUNEAU, ALASKA
99801

Page Number :1-A
Total Pages :3
Certificate Date: 29-AUG-91
Invoice No. :I9120286
P.O. Number :SF49001

Project : GRANDUC
Comments: ATTN: PHIL ANDERSON CC: WALTER MELNYK ✓

CERTIFICATE OF ANALYSIS A9120286

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Ag ppm AAS	Al % (ICP)	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Ca % (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	K % (ICP)	Mg % (ICP)
37 00+00E	201	285	45	1.6	6.38	1110	< 0.5	< 2	1.13	4.0	162	249	3010	8.82	1.87	3.58
37 01+00E	201	285	85	1.2	7.37	840	< 0.5	< 2	2.00	1.5	187	156	7110	11.10	1.38	2.95
37 02+00E	201	285	180	3.4	6.97	1250	< 0.5	< 2	1.86	3.0	57	116	>10000	12.50	2.54	2.62
37 03+00E	201	285	15	0.6	7.89	800	< 0.5	< 2	1.06	4.5	38	217	1605	7.19	2.15	4.21
37 04+00E	201	285	80	2.4	6.34	2750	< 0.5	< 2	0.79	3.0	73	96	6490	8.76	1.81	2.48
37 05+00E	201	285	10	3.8	6.23	1520	< 0.5	2	0.41	3.5	74	88	1005	8.11	1.82	1.82
37 06+00E	201	285	< 5	0.4	6.75	500	< 0.5	< 2	0.88	1.5	30	433	449	7.01	2.72	5.46
37 01+00W	201	285	< 5	< 0.2	6.48	520	< 0.5	< 2	1.86	0.5	35	159	462	7.30	1.61	2.71
37 02+00W	201	285	< 5	< 0.2	6.96	810	< 0.5	< 2	1.24	< 0.5	26	279	1285	6.27	1.76	3.42
37 03+00W	201	285	< 5	0.8	6.62	640	< 0.5	< 2	3.49	3.0	36	410	374	6.96	1.62	4.87
37 04+00W	201	285	< 5	0.4	6.62	450	< 0.5	< 2	3.69	1.5	81	590	901	7.65	1.37	7.00
37 05+00W	201	285	25	< 0.2	7.78	460	< 0.5	< 2	2.47	0.5	26	244	522	7.00	1.03	3.24
37 07+00W	201	285	< 5	0.2	5.69	380	< 0.5	< 2	0.56	3.0	33	896	472	8.07	1.43	6.73
41 01E	201	285	35	0.4	5.36	940	< 0.5	< 2	1.47	1.0	65	157	1100	6.99	1.26	2.33
41 02E	201	285	< 5	1.0	5.72	1550	< 0.5	< 2	1.20	2.0	37	114	863	5.80	1.48	1.96
41 03E	201	285	80	1.8	4.73	1030	< 0.5	18	0.34	0.5	59	96	4790	5.75	1.23	1.60
41 04E	201	285	< 5	0.6	6.58	910	< 0.5	< 2	1.56	1.0	52	157	863	6.38	1.63	2.56
41 05E	201	285	< 5	< 0.2	6.84	500	< 0.5	< 2	1.03	< 0.5	12	167	391	5.75	1.15	2.44
41 06E	201	285	< 5	0.4	6.69	620	< 0.5	< 2	1.81	< 0.5	32	209	258	6.26	1.36	2.81
41 07E	201	285	< 5	0.6	6.54	380	< 0.5	< 2	1.40	< 0.5	23	195	432	6.33	1.10	2.78
41 08E	201	285	5	0.4	7.25	370	< 0.5	< 2	1.24	< 0.5	45	173	557	7.16	1.31	2.71
41 09E	201	285	< 5	< 0.2	7.73	460	< 0.5	< 2	1.83	< 0.5	32	95	244	7.18	1.84	2.20
41 10E	201	285	< 5	< 0.2	5.82	660	0.5	< 2	0.44	< 0.5	21	358	135	7.11	2.92	4.04
41 11E	201	285	< 5	0.6	6.48	400	< 0.5	< 2	1.77	< 0.5	86	288	659	8.00	1.54	3.84
41 12E	201	285	< 5	< 0.2	6.67	480	1.0	< 2	2.95	< 0.5	22	251	326	6.75	1.30	3.13
45 00E	201	285	115	4.6	6.65	1540	< 0.5	< 2	1.89	1.0	73	33	>10000	14.20	2.63	2.02
45 01E	201	285	55	2.2	5.56	850	< 0.5	< 2	4.06	2.0	110	67	>10000	10.65	1.76	1.94
45 02E	201	285	10	0.8	6.72	1310	0.5	< 2	0.74	1.0	47	106	1165	7.52	1.03	1.83
45 03E	201	285	< 5	< 0.2	6.38	580	1.0	< 2	0.65	< 0.5	12	177	652	5.71	1.63	2.31
45 04E	201	285	< 5	< 0.2	8.87	620	< 0.5	< 2	2.58	5.0	241	26	486	9.67	1.86	2.58
45 05E	201	285	< 5	0.6	7.40	510	0.5	< 2	1.82	0.5	36	231	905	7.23	1.63	3.47
45 06E	201	285	110	0.6	7.02	480	< 0.5	154	0.15	< 0.5	217	192	976	12.00	3.48	3.68
45 07E	201	285	20	0.6	7.66	450	< 0.5	< 2	1.75	< 0.5	72	267	806	8.03	1.62	3.85
45 08E	201	285	< 5	< 0.2	7.58	180	< 0.5	< 2	2.71	< 0.5	64	113	612	8.21	0.82	2.32
45 09E	201	285	< 5	1.0	6.45	400	< 0.5	< 2	1.59	< 0.5	15	230	306	6.89	1.07	2.76
L37 05W	201	285	< 5	0.6	5.93	450	< 0.5	< 2	1.91	< 0.5	11	166	139	5.43	0.83	2.02
L37 06W	201	285	< 5	1.0	6.53	480	1.0	< 2	2.05	< 0.5	31	170	268	6.63	0.97	2.22
L37 07W	201	285	< 5	< 0.2	5.83	320	< 0.5	< 2	2.85	0.5	16	310	155	6.40	0.62	3.53
L37 08W	201	285	< 5	< 0.2	6.54	490	< 0.5	< 2	2.06	< 0.5	19	147	140	6.34	0.85	2.21
L37 09W	201	285	< 5	2.6	6.16	420	< 0.5	< 2	1.85	0.5	16	197	211	6.58	0.77	2.65

CERTIFICATION: B. Caghi

Chemex Labs Ltd.

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British Columbia, Canada V7J 2C1
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To: HECLA MINING COMPANY

1112 GLACIER AVE.
JUNEAU, ALASKA
99801

Project : GRANDUC
Comments: ATTN: PHIL ANDERSON CC: WALTER MELNYK

Certificate Date: 29-AUG-91
Invoice No. :I9120286
P.O. Number :SF49001

CERTIFICATE OF ANALYSIS A9120286

SAMPLE DESCRIPTION	PREP CODE		Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)			
37 00+00E	201	285	3160	25	0.95	95	1030	474	108	0.44	228	10	806			
37 01+00E	201	285	1520	9	1.07	93	610	178	178	0.51	207	< 10	1630			
37 02+00E	201	285	2050	11	0.82	57	1150	246	152	0.53	191	< 10	1345			
37 03+00E	201	285	2460	1	2.22	55	1420	192	162	0.57	228	< 10	1050			
37 04+00E	201	285	1565	20	0.71	93	950	516	81	0.38	348	10	1375			
37 05+00E	201	285	2180	31	0.76	69	1610	2600	58	0.29	245	< 10	1950			
37 06+00E	201	285	2670	< 1	0.65	125	840	168	54	0.40	237	10	416			
37 01+00W	201	285	1020	9	1.16	53	1080	14	261	0.42	191	< 10	168			
37 02+00W	201	285	1205	6	1.82	66	910	38	164	0.44	226	< 10	128			
37 03+00W	201	285	1515	9	0.92	172	1450	132	182	0.44	253	< 10	284			
37 04+00W	201	285	2400	< 1	1.01	269	1350	110	172	0.42	216	< 10	292			
37 05+00W	201	285	1335	7	1.61	92	900	68	223	0.45	204	< 10	196			
37 07+00W	201	285	2050	10	0.60	205	1100	30	38	0.35	236	20	242			
41 01E	201	285	1800	31	1.09	48	1760	110	115	0.30	198	< 10	196			
41 02E	201	285	2220	19	0.93	55	1710	110	97	0.30	206	< 10	298			
41 03E	201	285	680	28	0.50	34	680	108	60	0.31	155	< 10	356			
41 04E	201	285	2130	9	1.31	46	1840	130	146	0.42	184	< 10	342			
41 05E	201	285	775	3	1.73	41	1750	62	130	0.43	182	< 10	184			
41 06E	201	285	1490	4	1.56	50	2390	64	156	0.45	202	10	206			
41 07E	201	285	995	3	1.52	47	2020	44	133	0.41	192	10	162			
41 08E	201	285	1240	5	1.87	54	1520	34	135	0.40	186	< 10	152			
41 09E	201	285	1595	3	2.72	33	750	12	230	0.43	208	< 10	116			
41 10E	201	285	4120	2	0.50	102	1020	20	28	0.34	200	60	160			
41 11E	201	285	1770	3	1.29	89	1520	38	131	0.38	210	< 10	158			
41 12E	201	285	1255	< 1	1.53	102	1200	22	253	0.44	215	< 10	150			
45 00E	201	285	1855	23	0.97	44	1560	392	145	0.43	222	10	572			
45 01E	201	285	2290	9	0.85	57	1210	82	150	0.31	187	< 10	382			
45 02E	201	285	1760	20	1.33	58	2080	80	121	0.36	284	< 10	266			
45 03E	201	285	2200	6	0.83	49	1250	88	88	0.34	188	< 10	246			
45 04E	201	285	2400	1	1.80	21	1430	72	351	0.70	162	< 10	764			
45 05E	201	285	1195	2	1.28	69	1030	66	139	0.49	217	< 10	216			
45 06E	201	285	3500	11	0.37	78	750	248	18	0.35	229	50	260			
45 07E	201	285	1425	3	1.77	77	1250	22	179	0.53	218	< 10	152			
45 08E	201	285	1135	5	2.90	32	1110	8	270	0.41	189	< 10	116			
45 09E	201	285	945	4	1.45	53	1830	34	128	0.43	192	< 10	128			
L37 05W	201	285	890	5	1.33	46	2230	46	181	0.42	172	< 10	100			
L37 06W	201	285	2510	8	1.56	56	3060	62	209	0.46	204	< 10	176			
L37 07W	201	285	1100	1	1.22	105	1520	22	208	0.39	186	< 10	110			
L37 08W	201	285	1425	7	1.64	42	2710	46	231	0.53	222	< 10	120			
L37 09W	201	285	1120	2	1.31	59	2010	40	174	0.46	189	< 10	124			

CERTIFICATION: B. Caughlin

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L41 00W	201	285	< 5	0.8	5.13	960	< 0.5	< 2	1.23	1.5	74	126	913	5.69	1.19	1.94
L41 01W	201	285	< 5	0.8	6.55	910	< 0.5	4	1.32	0.5	60	172	2400	7.38	1.15	2.67
L41 02W	201	285	30	1.0	5.66	550	< 0.5	< 2	1.36	0.5	16	101	1905	7.32	0.90	1.84
L41 04W	201	285	5	0.4	8.59	330	< 0.5	< 2	1.93	< 0.5	27	52	1515	8.31	0.88	2.04
L41 05W	201	285	< 5	0.6	6.63	450	< 0.5	< 2	1.40	< 0.5	17	132	807	6.67	0.84	2.10
L41 06W	201	285	< 5	0.6	6.61	420	< 0.5	< 2	1.48	< 0.5	12	114	608	6.29	0.65	1.97
L41 07W	201	285	< 5	0.8	6.63	430	< 0.5	< 2	1.80	< 0.5	13	173	252	6.27	0.83	2.35
L41 08W	201	285	< 5	0.2	5.79	420	< 0.5	< 2	1.75	< 0.5	16	149	97	6.05	0.91	2.16
L41 09W	201	285	< 5	0.2	7.86	420	< 0.5	< 2	1.81	< 0.5	24	196	313	7.33	1.40	2.44
L44 00E	201	285	< 5	0.4	5.39	160	< 0.5	< 2	3.28	< 0.5	16	492	136	5.54	0.48	5.15
L44 01E	201	285	< 5	< 0.2	5.09	180	< 0.5	< 2	3.77	< 0.5	26	734	258	6.22	0.43	6.40
L44 02E	201	285	< 5	0.4	4.75	190	< 0.5	< 2	4.05	< 0.5	17	612	403	6.13	0.51	5.74
L44 03E	201	285	< 5	< 0.2	4.48	140	< 0.5	< 2	5.09	< 0.5	20	854	338	6.57	0.43	6.11
L44 04E	201	285	410	3.6	5.23	200	< 0.5	< 2	5.02	1.5	44	884	4300	8.17	0.85	6.24
L44 05E	201	285	< 5	< 0.2	5.43	180	< 0.5	< 2	4.76	0.5	28	864	1105	7.19	0.70	7.39
L44 06E	201	285	< 5	< 0.2	4.44	120	< 0.5	< 2	4.49	< 0.5	30	759	298	5.82	0.41	7.41
L44 08E	201	285	< 5	< 0.2	4.35	110	< 0.5	< 2	3.20	< 0.5	34	540	354	4.63	0.37	12.65
L44 09E	201	285	< 5	< 0.2	4.60	170	< 0.5	< 2	4.17	< 0.5	25	1380	133	7.45	0.52	9.47
L44 10E	201	285	< 5	< 0.2	4.27	120	< 0.5	< 2	3.81	< 0.5	27	947	81	6.58	0.50	12.15
L44 11E	201	285	< 5	< 0.2	5.30	210	< 0.5	< 2	4.61	< 0.5	26	732	212	6.89	0.62	9.10
L44 12E	201	285	< 5	< 0.2	5.61	250	< 0.5	< 2	4.21	0.5	33	570	304	6.60	0.68	8.00
L44 13E	201	285	< 5	< 0.2	4.50	200	< 0.5	< 2	4.90	< 0.5	31	770	202	6.81	0.61	8.66
L44 14E	201	285	< 5	< 0.2	4.80	180	< 0.5	< 2	4.12	0.5	35	1005	180	7.06	0.54	9.38
L44 17E	201	285	< 5	< 0.2	4.34	140	< 0.5	< 2	4.23	< 0.5	32	1070	194	7.24	0.44	8.93
L44 19E	201	285	< 5	< 0.2	4.28	120	< 0.5	< 2	4.73	< 0.5	35	978	188	6.17	0.36	10.75
L44 20E	201	285	< 5	< 0.2	4.39	130	< 0.5	< 2	4.74	0.5	39	952	191	6.66	0.39	11.35
L45 01W	201	285	160	4.4	6.17	940	< 0.5	< 2	1.09	1.0	129	122	6900	10.05	1.48	2.35
L45 1+50W	201	285	< 5	0.6	7.95	640	< 0.5	< 2	0.99	1.0	27	249	758	7.00	1.23	3.00
L45 4+10W	201	285	< 5	0.4	5.81	390	< 0.5	< 2	1.20	< 0.5	16	134	194	5.24	0.84	2.10
L45 05W	201	285	< 5	< 0.2	6.29	430	< 0.5	< 2	1.57	< 0.5	16	150	162	5.81	0.88	2.30
L45 06W	201	285	45	0.6	6.85	400	< 0.5	< 2	1.99	< 0.5	19	266	336	6.46	0.95	3.10
L45 07W	201	285	< 5	0.2	7.13	430	< 0.5	< 2	2.08	0.5	25	216	405	6.16	0.99	2.96
L45 08W	201	285	< 5	< 0.2	7.27	450	< 0.5	< 2	1.50	< 0.5	21	184	291	5.73	1.04	2.68
M38 09W	201	285	15	< 0.2	6.00	380	< 0.5	< 2	1.56	< 0.5	3	105	22	2.58	0.90	1.14
M38 10W	201	285	< 5	< 0.2	6.45	260	< 0.5	< 2	1.18	< 0.5	4	155	59	6.35	1.05	1.61
M38 11W	201	285	< 5	< 0.2	7.12	330	< 0.5	< 2	2.69	< 0.5	7	282	46	5.29	0.94	3.12
M38 12W	201	285	< 5	< 0.2	8.43	340	< 0.5	< 2	2.74	0.5	18	291	123	6.00	0.78	3.98
M38 13W	201	285	< 5	< 0.2	5.89	270	< 0.5	< 2	1.50	< 0.5	6	199	73	4.02	0.80	2.36
M38 14W	201	285	< 5	< 0.2	7.53	370	< 0.5	< 2	2.65	< 0.5	16	292	70	6.18	1.21	3.40
M38 15W	201	285	35	< 0.2	6.57	370	< 0.5	< 2	2.38	< 0.5	21	328	110	5.38	0.77	3.91

CERTIFICATION: B. Caufield

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: HECLA MINING COMPANY

1112 GLACIER AVE.
JUNEAU, ALASKA
99801

Page Number :2-B
Total Pages :3
Certificate Date: 29-AUG-91
Invoice No. :I9120286
P.O. Number :SF49001

Project : GRANDUC
Comments: ATTN: PHIL ANDERSON CC: WALTER MELNYK

CERTIFICATE OF ANALYSIS A9120286

SAMPLE DESCRIPTION	PREP CODE		Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)			
L41 00W	201	285	2380	22	1.14	41	1920	98	117	0.32	190	< 10	184			
L41 01W	201	285	1390	12	1.75	60	1740	96	140	0.45	255	< 10	236			
L41 02W	201	285	835	11	0.81	33	2290	62	141	0.41	183	< 10	264			
L41 04W	201	285	1420	2	2.11	26	930	74	247	0.57	244	< 10	192			
L41 05W	201	285	810	3	1.35	46	1280	132	164	0.45	195	< 10	362			
L41 06W	201	285	860	5	1.45	33	1620	58	195	0.49	210	< 10	162			
L41 07W	201	285	1030	6	1.48	46	2420	42	191	0.48	201	< 10	124			
L41 08W	201	285	1160	5	1.39	43	2070	34	180	0.51	192	< 10	96			
L41 09W	201	285	1675	6	1.77	58	2050	48	160	0.46	184	< 10	146			
L44 00E	201	285	1075	< 1	0.92	149	1780	14	159	0.29	165	< 10	106			
L44 01E	201	285	1280	< 1	0.62	224	1730	16	111	0.29	185	< 10	134			
L44 02E	201	285	1165	< 1	0.63	206	1480	28	124	0.28	167	< 10	156			
L44 03E	201	285	1395	< 1	0.47	227	910	20	115	0.26	157	10	148			
L44 04E	201	285	1740	2	0.50	253	1490	282	114	0.25	209	30	274			
L44 05E	201	285	1465	< 1	0.56	284	910	28	108	0.29	198	10	166			
L44 06E	201	285	1230	< 1	0.43	300	1050	4	91	0.24	165	< 10	156			
L44 08E	201	285	1045	< 1	0.29	716	210	12	46	0.17	104	< 10	182			
L44 09E	201	285	1410	< 1	0.76	447	840	10	134	0.29	174	20	160			
L44 10E	201	285	1340	< 1	0.43	615	390	< 2	90	0.26	134	10	122			
L44 11E	201	285	1365	2	1.00	383	790	6	197	0.30	179	10	110			
L44 12E	201	285	1350	< 1	1.11	343	910	10	261	0.31	183	< 10	106			
L44 13E	201	285	1280	< 1	0.92	365	900	8	193	0.31	178	40	92			
L44 14E	201	285	1420	< 1	0.84	440	790	8	160	0.32	173	10	110			
L44 17E	201	285	1220	< 1	0.72	410	750	8	140	0.30	172	10	100			
L44 19E	201	285	1265	< 1	0.58	556	660	2	136	0.30	144	10	100			
L44 20E	201	285	1320	< 1	0.57	595	750	4	122	0.33	153	10	98			
L45 01W	201	285	1745	25	0.90	75	1630	264	107	0.36	215	< 10	394			
L45 1+50W	201	285	2170	5	1.29	107	1390	72	120	0.48	244	< 10	256			
L45 4+10W	201	285	1115	2	1.24	46	3400	32	159	0.38	175	< 10	100			
L45 05W	201	285	1110	4	1.33	49	2460	42	187	0.49	187	< 10	126			
L45 06W	201	285	1085	3	1.30	77	1720	40	168	0.43	195	< 10	126			
L45 07W	201	285	1835	1	1.46	63	1380	32	210	0.48	209	< 10	140			
L45 08W	201	285	1605	3	1.34	54	1960	38	179	0.43	170	< 10	134			
M38 09W	201	285	570	1	1.59	24	1210	20	229	0.38	110	< 10	40			
M38 10W	201	285	625	2	1.46	34	1990	36	132	0.41	123	< 10	72			
M38 11W	201	285	820	4	1.55	73	1760	20	219	0.50	191	< 10	82			
M38 12W	201	285	1510	< 1	2.17	82	1260	8	427	0.47	200	< 10	138			
M38 13W	201	285	555	1	1.63	59	1350	14	170	0.38	132	< 10	64			
M38 14W	201	285	1895	1	1.88	75	2540	16	221	0.46	173	< 10	104			
M38 15W	201	285	1300	< 1	1.97	102	1170	6	241	0.44	179	< 10	88			

CERTIFICATION: B. Caughlin

Chemex Labs Ltd.

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British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: HECLA MINING COMPANY

1112 GLACIER AVE.
JUNEAU, ALASKA
99801

Certificate Date: 29-AUG-91
Invoice No. :I9120286
P.O. Number :SF49001

Project : GRANDUC
Comments: ATTN: PHIL ANDERSON CC: WALTER MELNYK

CERTIFICATE OF ANALYSIS A9120286

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Ag ppm AAS	Al % (ICP)	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Ca % (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	K % (ICP)	Mg % (ICP)
M38 16W	201	285	< 5	< 0.2	5.92	190	< 0.5	< 2	2.26	< 0.5	8	271	28	5.94	0.70	2.98
M38 17W	201	285	< 5	< 0.2	7.21	380	< 0.5	< 2	2.51	< 0.5	20	320	147	5.85	1.00	4.02
M38 18W	201	285	< 5	< 0.2	6.64	260	< 0.5	< 2	1.71	< 0.5	6	207	55	5.15	0.73	2.19
M38 19W	201	285	< 5	< 0.2	6.85	280	< 0.5	< 2	2.06	< 0.5	13	252	103	5.78	0.57	3.03
M38 20W	201	285	< 5	< 0.2	6.41	210	< 0.5	< 2	1.46	< 0.5	9	164	47	4.99	0.59	1.79
M38 21W	201	285	< 5	< 0.2	7.66	300	< 0.5	< 2	1.82	< 0.5	11	229	82	6.03	0.58	3.05
M38 22W	201	285	< 5	< 0.2	7.23	310	< 0.5	< 2	1.53	< 0.5	9	187	63	5.89	0.69	2.40
M38 23W	201	285	15	< 0.2	7.43	460	< 0.5	< 2	2.05	< 0.5	16	226	120	5.44	0.93	3.26
M38 24W	201	285	< 5	< 0.2	8.07	360	< 0.5	< 2	2.25	< 0.5	22	244	69	5.57	0.87	3.01
M38 25W	201	285	< 5	< 0.2	7.53	550	< 0.5	< 2	2.35	0.5	21	220	192	5.70	1.18	3.18
M38 26W	201	285	< 5	< 0.2	6.34	300	< 0.5	< 2	2.72	< 0.5	17	372	82	6.01	1.00	3.98
M38 27W	201	285	< 5	< 0.2	7.98	420	< 0.5	< 2	2.56	< 0.5	18	246	119	5.82	0.86	3.19
M38 28W	201	285	< 5	< 0.2	7.11	310	< 0.5	< 2	2.16	0.5	11	249	79	6.28	0.58	2.98
M38 31W	201	285	< 5	< 0.2	6.71	480	< 0.5	< 2	1.84	< 0.5	11	254	112	5.36	0.84	3.08
M38 32W	201	285	< 5	< 0.2	6.76	460	< 0.5	< 2	1.88	< 0.5	11	268	91	5.20	0.77	3.27
M38 34W	201	285	< 5	< 0.2	7.31	260	< 0.5	< 2	2.00	< 0.5	8	197	58	6.46	0.50	2.32
M41 00W	201	285	< 5	< 0.2	6.67	290	< 0.5	< 2	1.19	< 0.5	14	340	87	5.64	0.59	3.72
M41 01W	201	285	< 5	< 0.2	8.05	310	< 0.5	< 2	1.57	< 0.5	15	261	189	5.85	1.31	2.46
M41 02W	201	285	< 5	< 0.2	6.69	360	< 0.5	< 2	2.92	0.5	18	306	78	5.68	0.70	3.58
M41 03W	201	285	< 5	< 0.2	6.83	330	< 0.5	< 2	2.25	< 0.5	18	396	93	5.80	0.62	4.05
M41 04W	201	285	< 5	< 0.2	7.85	530	< 0.5	< 2	1.84	< 0.5	14	80	106	5.99	1.17	2.54
M41 05W	201	285	< 5	< 0.2	7.15	380	< 0.5	< 2	1.65	< 0.5	5	99	44	5.18	0.60	1.63
M41 06W	201	285	< 5	< 0.2	6.70	340	< 0.5	< 2	1.20	< 0.5	19	297	120	6.29	0.82	3.25
M41 07W	201	285	< 5	< 0.2	7.25	360	< 0.5	< 2	1.62	< 0.5	18	387	96	6.20	0.79	4.51
M41 08W	201	285	< 5	< 0.2	6.20	430	< 0.5	< 2	1.46	< 0.5	4	113	29	5.33	0.84	1.48
M41 09W	201	285	< 5	< 0.2	6.26	390	< 0.5	< 2	3.05	< 0.5	10	292	24	5.38	0.88	3.60
M41 10W	201	285	< 5	< 0.2	6.13	250	< 0.5	< 2	2.24	< 0.5	11	380	54	6.75	0.57	3.88
M41 22.7W	201	285	< 5	< 0.2	6.55	410	< 0.5	< 2	1.39	< 0.5	8	170	86	5.01	0.86	2.62
M41 24W	201	285	< 5	< 0.2	7.23	460	< 0.5	< 2	1.98	< 0.5	10	209	78	5.52	0.87	3.14
M41 25W	201	285	< 5	< 0.2	6.68	350	< 0.5	< 2	3.28	0.5	19	471	123	6.02	0.71	5.07
M41 26W	201	285	< 5	< 0.2	7.70	650	< 0.5	< 2	2.07	0.5	18	206	154	5.79	1.08	3.34
M41 28W	201	285	< 5	< 0.2	7.16	650	< 0.5	< 2	2.21	< 0.5	21	211	160	5.71	1.03	3.04
M41 29W	201	285	< 5	< 0.2	6.71	410	< 0.5	< 2	1.52	< 0.5	16	197	104	5.68	0.94	2.68
M41 30W	201	285	< 5	< 0.2	6.72	490	< 0.5	< 2	1.95	0.5	20	221	113	5.82	0.92	3.03
M41 31W	201	285	< 5	< 0.2	7.81	220	< 0.5	< 2	2.80	< 0.5	18	347	176	5.83	0.76	4.48
M41 32W	201	285	< 5	< 0.2	7.14	670	< 0.5	< 2	2.28	< 0.5	27	282	182	6.28	1.14	3.75
M41 33W	201	285	< 5	< 0.2	6.39	210	< 0.5	< 2	2.40	< 0.5	10	346	45	5.53	0.59	4.08
M41 34W	201	285	< 5	< 0.2	6.72	250	< 0.5	< 2	2.53	< 0.5	24	390	73	5.86	0.66	4.62

CERTIFICATION: B. Caufield

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Project : GRANDUC
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Certificate Date: 29-AUG-91
Invoice No. :I9120286
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CERTIFICATE OF ANALYSIS A9120286

SAMPLE DESCRIPTION	PREP CODE		Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)			
M38 16W	201	285	990	1	1.28	63	1260	10	134	0.41	143	< 10	64			
M38 17W	201	285	1500	1	1.59	98	1710	6	237	0.43	191	< 10	96			
M38 18W	201	285	645	2	1.44	47	1270	10	165	0.43	139	< 10	66			
M38 19W	201	285	975	2	1.44	74	1830	6	194	0.41	177	< 10	82			
M38 20W	201	285	880	2	1.30	44	1340	12	141	0.35	112	< 10	72			
M38 21W	201	285	825	2	1.65	61	660	10	208	0.45	161	< 10	78			
M38 22W	201	285	780	< 1	1.33	52	1060	10	183	0.42	148	< 10	72			
M38 23W	201	285	1110	1	1.84	69	1480	14	246	0.49	192	< 10	110			
M38 24W	201	285	1310	9	1.82	60	1170	10	240	0.43	161	< 10	102			
M38 25W	201	285	1325	1	2.12	74	1030	24	296	0.47	181	< 10	122			
M38 26W	201	285	1085	7	1.54	78	1080	20	141	0.44	168	< 10	84			
M38 27W	201	285	1175	3	1.95	72	1330	10	282	0.44	182	< 10	100			
M38 28W	201	285	815	< 1	1.48	62	930	6	214	0.42	188	< 10	72			
M38 31W	201	285	800	4	1.49	79	1290	14	206	0.42	177	< 10	108			
M38 32W	201	285	770	1	1.57	77	1050	10	211	0.44	182	< 10	106			
M38 34W	201	285	705	< 1	1.42	47	670	12	204	0.50	193	< 10	66			
M41 00W	201	285	770	< 1	1.58	70	930	6	179	0.36	213	< 10	90			
M41 01W	201	285	1000	1	2.02	73	1350	8	163	0.48	175	< 10	110			
M41 02W	201	285	1050	< 1	1.43	72	1560	10	263	0.51	219	< 10	90			
M41 03W	201	285	1235	< 1	1.62	106	1420	8	253	0.48	209	< 10	110			
M41 04W	201	285	2050	2	1.83	34	1320	12	318	0.59	194	< 10	130			
M41 05W	201	285	475	1	1.33	27	1410	6	271	0.47	145	< 10	78			
M41 06W	201	285	1175	3	1.46	92	1140	12	163	0.43	184	< 10	102			
M41 07W	201	285	1155	< 1	1.68	125	970	10	185	0.47	204	< 10	114			
M41 08W	201	285	610	1	1.10	29	1400	10	253	0.49	145	< 10	64			
M41 09W	201	285	1420	3	1.57	69	1040	22	272	0.48	187	< 10	86			
M41 10W	201	285	780	< 1	1.34	96	1260	8	163	0.43	183	< 10	80			
M41 22.7W	201	285	625	2	1.45	52	1100	24	178	0.45	177	< 10	108			
M41 24W	201	285	785	4	1.71	63	1060	18	232	0.49	200	< 10	120			
M41 25W	201	285	1060	< 1	1.61	119	950	12	200	0.44	201	< 10	112			
M41 26W	201	285	1200	< 1	2.12	75	1210	16	289	0.51	185	< 10	142			
M41 28W	201	285	1140	4	1.90	83	1130	16	261	0.51	194	< 10	134			
M41 29W	201	285	1045	4	1.44	55	1020	20	183	0.47	182	< 10	118			
M41 30W	201	285	1045	3	1.70	75	1150	20	225	0.44	188	< 10	130			
M41 31W	201	285	1060	1	1.71	103	860	10	198	0.41	188	< 10	118			
M41 32W	201	285	1375	3	1.81	108	1110	14	263	0.47	193	< 10	136			
M41 33W	201	285	760	< 1	1.41	86	800	8	169	0.41	176	10	88			
M41 34W	201	285	1335	1	1.50	102	790	8	185	0.42	184	10	122			

CERTIFICATION: B. Caughlin

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: HECLA MINING COMPANY

1112 GLACIER AVE.
JUNEAU, ALASKA
99801

Page Number :1-A
Total Pages :1
Certificate Date: 28-AUG-91
Invoice No. :I9120285
P.O. Number :SF49001

Project : GRANDUC
Comments: ATTN: PHIL ANDERSON CC: WALTER MELNYK

CERTIFICATE OF ANALYSIS A9120285

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Ag ppm AAS	Al % (ICP)	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Ca % (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	K % (ICP)	Mg % (ICP)
19752	201	285	45	< 0.2	6.76	420	< 0.5	< 2	3.05	0.5	36	374	262	6.84	1.26	4.20
19754	201	285	25	0.4	6.60	360	< 0.5	< 2	3.04	1.0	36	379	272	6.70	1.21	4.36
19770	201	285	230	< 0.2	3.83	100	< 0.5	< 2	3.58	< 0.5	27	1035	115	7.00	0.42	11.60
19771	201	285	15	< 0.2	4.76	250	< 0.5	< 2	4.72	< 0.5	43	1365	269	7.45	0.68	8.27
19772	201	285	15	< 0.2	4.30	250	< 0.5	< 2	5.45	0.5	43	2000	223	8.03	0.50	8.90
19779	201	285	< 5	< 0.2	8.33	1290	< 0.5	< 2	0.76	0.5	21	97	73	5.36	3.43	2.06
19786	201	285	< 5	< 0.2	7.66	640	< 0.5	< 2	2.38	0.5	22	171	189	5.36	1.16	2.61
19789	201	285	< 5	< 0.2	7.31	710	< 0.5	< 2	2.53	0.5	19	200	115	5.45	1.04	2.81
19793	201	285	< 5	< 0.2	6.69	610	< 0.5	< 2	3.65	0.5	19	246	98	5.03	1.01	3.03
19794	201	285	< 5	< 0.2	6.38	460	< 0.5	< 2	1.35	0.5	20	172	130	5.89	0.86	4.57
19796	203	205	< 5	< 0.2	7.42	740	< 0.5	< 2	1.43	< 0.5	20	196	157	5.97	1.20	3.32
19798	201	285	< 5	< 0.2	6.59	400	< 0.5	< 2	4.18	1.0	19	77	198	5.43	0.80	3.34
19799	201	285	< 5	< 0.2	6.86	430	< 0.5	< 2	4.36	1.0	28	105	449	5.68	0.96	2.85

CERTIFICATION: B. Caplin

Chemex Labs Ltd.

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Page Number : 1-B
Total Pages : 1
Certificate Date: 28-AUG-91
Invoice No. : I9120285
P.O. Number : SF49001

Project : GRANDUC
Comments: ATTN: PHIL ANDERSON CC: WALTER MELNYK

CERTIFICATE OF ANALYSIS A9120285

SAMPLE DESCRIPTION	PREP CODE		Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)			
19752	201	285	1235	2	1.56	126	1250	78	192	0.40	199	10	138			
19754	201	285	1280	< 1	1.43	131	1280	90	175	0.40	201	< 10	132			
19770	201	285	1255	< 1	0.30	649	710	6	65	0.26	147	20	150			
19771	201	285	1320	< 1	0.93	374	830	14	202	0.30	188	30	128			
19772	201	285	1305	< 1	0.65	454	760	12	189	0.30	184	50	152			
19779	201	285	1225	< 1	1.66	38	1230	34	211	0.49	137	< 10	118			
19786	201	285	1140	< 1	2.14	60	940	20	332	0.47	171	10	102			
19789	201	285	985	2	1.98	74	990	12	298	0.53	206	< 10	112			
19793	201	285	990	< 1	1.93	77	940	8	315	0.46	176	< 10	98			
19794	201	285	1355	2	1.69	64	1030	46	174	0.45	194	< 10	132			
19796	203	205	1310	1	1.69	64	1000	16	252	0.50	177	< 10	124			
19798	201	285	1065	2	2.09	39	1220	22	224	0.55	160	< 10	118			
19799	201	285	1015	2	2.42	44	1350	28	240	0.46	179	< 10	132			

CERTIFICATION: B. Caughlin

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Project : GRANDUC
Comments: ATTN: PHIL ANDERSON CC: WALTER MELNYK

Certificate Date: 31-AUG-91
Invoice No. :I9120289
P.O. Number :SF49001

CERTIFICATE OF ANALYSIS A9120289

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Au FA oz/T	Ag ppm AAS	Al % (ICP)	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Ca % (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	K % (ICP)
19554	205	294	< 5	-----	< 0.2	3.12	1530	< 0.5	4	0.16	< 0.5	1	240	159	3.21	1.17
19555	205	294	< 5	-----	0.4	3.56	590	< 0.5	12	0.30	1.0	61	167	415	3.63	1.83
19556	205	294	< 5	-----	1.2	1.08	1040	< 0.5	< 2	0.06	< 0.5	2	158	83	1.44	0.49
19557	205	294	< 5	-----	0.6	3.58	1680	< 0.5	4	0.12	< 0.5	3	139	158	2.11	1.43
19558	205	294	< 5	-----	3.0	4.82	200	< 0.5	626	0.05	0.5	4	216	91	4.58	2.50
19559	205	294	< 5	-----	0.8	2.30	150	< 0.5	8	0.32	< 0.5	18	237	449	3.50	0.50
19560	205	294	< 5	-----	< 0.2	8.60	310	< 0.5	< 2	2.19	< 0.5	59	70	27	10.65	4.80
19561	205	294	< 5	-----	1.4	5.46	1500	< 0.5	< 2	0.42	< 0.5	3	182	650	2.89	2.40
19562	205	294	< 5	-----	1.4	4.63	1790	< 0.5	< 2	0.29	< 0.5	1	109	127	2.71	2.08
19563	205	294	< 5	-----	1.0	4.45	1590	< 0.5	< 2	0.45	< 0.5	2	99	158	2.99	1.82
19564	205	294	< 5	-----	< 0.2	3.54	1530	< 0.5	< 2	0.19	1.0	129	139	87	2.99	1.35
19565	205	294	< 5	-----	< 0.2	8.46	1440	< 0.5	< 2	1.07	0.5	12	72	134	4.55	2.18
19566	205	294	< 5	-----	0.4	5.71	1620	< 0.5	< 2	0.97	1.0	227	112	142	4.20	1.87
19567	205	294	< 5	-----	< 0.2	5.76	1370	< 0.5	< 2	0.79	0.5	9	122	93	3.33	1.85
19568	205	294	< 5	-----	< 0.2	7.32	1350	< 0.5	< 2	1.11	0.5	7	121	73	3.47	2.09
19569	205	294	< 5	-----	< 0.2	5.83	1680	< 0.5	< 2	0.78	< 0.5	53	162	108	3.34	1.97
19570	205	294	< 5	-----	< 0.2	3.48	1800	< 0.5	< 2	0.16	< 0.5	5	120	96	2.68	1.60
19571	205	294	45	-----	< 0.2	4.43	1900	< 0.5	< 2	0.23	< 0.5	5	191	91	2.36	1.96
19572	205	294	< 5	-----	< 0.2	3.26	1090	< 0.5	< 2	0.07	< 0.5	1	253	86	2.46	1.17
19573	205	294	10	-----	< 0.2	7.88	1800	< 0.5	< 2	1.18	0.5	6	109	134	3.92	2.92
19574	205	294	< 5	-----	0.4	5.85	1570	< 0.5	< 2	0.34	< 0.5	6	102	196	3.13	2.61
19575	205	294	< 5	-----	< 0.2	5.33	2030	< 0.5	< 2	0.63	0.5	3	88	177	3.47	2.48
19576	205	294	< 5	-----	< 0.2	4.03	2170	< 0.5	< 2	0.30	0.5	4	79	172	3.34	1.97
19577	205	294	< 5	-----	< 0.2	9.40	1130	2.5	< 2	1.65	< 0.5	3	48	20	0.51	2.58
19578	205	294	< 5	-----	< 0.2	8.88	390	< 0.5	< 2	2.77	< 0.5	10	151	107	5.63	1.14
19579	205	294	< 5	-----	< 0.2	9.85	450	< 0.5	< 2	1.48	< 0.5	16	39	233	2.46	1.53
19580	205	294	25	-----	4.8	9.17	510	< 0.5	< 2	3.28	0.5	76	99	1435	6.60	1.58
19581	205	294	< 5	-----	< 0.2	9.64	870	< 0.5	< 2	3.59	< 0.5	13	30	160	4.90	2.47
19582	205	294	< 5	-----	0.8	0.33	90	< 0.5	< 2	0.02	< 0.5	< 1	75	78	0.70	0.18
19583	205	294	< 5	-----	< 0.2	8.65	670	< 0.5	< 2	0.81	0.5	14	118	74	5.59	0.97
19584	205	294	< 5	-----	0.4	5.71	4430	< 0.5	< 2	1.10	< 0.5	5	153	1050	5.01	2.45
19585	205	294	< 5	-----	< 0.2	6.67	360	1.5	< 2	0.14	< 0.5	23	172	13	1.05	1.63
19586	205	294	610	-----	46.0	3.46	130	< 0.5	< 20	3.90	2.5	118	501	>10000	13.55	0.84
19587	205	294	330	-----	23.2	3.89	100	< 0.5	< 20	3.98	1.5	45	681	>10000	16.80	0.90
19588	205	294	755	-----	40.0	4.47	30	< 0.5	< 20	1.06	1.5	30	462	>10000	21.3	0.12
19589	205	294	120	-----	23.6	3.30	140	< 0.5	< 20	4.63	11.0	108	564	>10000	15.05	1.27
19590	205	294	< 5	-----	0.8	4.21	410	< 0.5	< 2	11.85	0.5	18	354	286	4.39	2.25
19591	205	294	225	-----	9.0	5.54	1590	< 0.5	< 2	12.95	1.5	23	256	3200	4.23	5.51
19592	205	294	< 5	-----	< 0.2	8.70	320	< 0.5	< 2	1.05	< 0.5	1	74	73	5.35	4.32
19593	205	294	30	-----	< 0.2	14.45	90	< 0.5	< 2	3.25	< 0.5	18	183	146	8.12	0.46

CERTIFICATION: B. Caughlin

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1112 GLACIER AVE.
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99801

Page Number :1-B
Total Pages :4
Certificate Date: 31-AUG-91
Invoice No. :I9120289
P.O. Number :SF49001

Project : GRANDUC
Comments: ATTN: PHIL ANDERSON CC: WALTER MELNYK

CERTIFICATE OF ANALYSIS A9120289

SAMPLE DESCRIPTION	PREP CODE		Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)		
19554	205	294	0.56	115	53	0.16	14	1070	244	17	0.13	325	< 10	40		
19555	205	294	0.57	80	38	0.06	24	1160	46	10	0.14	200	< 10	188		
19556	205	294	0.09	60	30	0.06	5	420	18	10	0.04	22	< 10	18		
19557	205	294	0.89	95	3	0.46	9	380	80	37	0.15	120	< 10	66		
19558	205	294	0.58	445	7	0.10	6	330	370	7	0.13	84	370	58		
19559	205	294	0.54	165	9	0.91	77	270	26	36	0.14	98	< 10	82		
19560	205	294	1.15	1745	11	0.20	26	1340	4	40	0.34	270	30	80		
19561	205	294	1.21	215	38	0.33	15	1840	18	33	0.28	297	< 10	88		
19562	205	294	0.91	95	35	0.08	4	1450	64	12	0.27	201	< 10	36		
19563	205	294	1.33	200	13	0.47	12	1170	74	72	0.30	165	< 10	96		
19564	205	294	1.02	190	11	0.43	17	530	88	54	0.18	193	< 10	96		
19565	205	294	2.58	615	6	2.29	19	1290	50	216	0.43	202	< 10	218		
19566	205	294	1.91	495	38	0.86	31	1770	100	126	0.29	310	< 10	156		
19567	205	294	1.65	505	37	1.07	15	1220	200	127	0.31	297	< 10	160		
19568	205	294	2.21	705	7	1.79	15	950	16	216	0.37	195	< 10	138		
19569	205	294	1.50	385	58	1.22	22	1850	72	152	0.32	475	< 10	96		
19570	205	294	0.81	110	13	0.41	18	500	64	44	0.22	112	< 10	52		
19571	205	294	0.84	110	12	0.65	12	500	22	53	0.24	148	< 10	36		
19572	205	294	1.02	80	10	0.45	8	320	24	35	0.14	179	< 10	42		
19573	205	294	2.34	465	7	2.00	23	2470	14	177	0.36	193	< 10	160		
19574	205	294	1.47	385	4	1.25	24	970	28	66	0.26	138	< 10	84		
19575	205	294	1.35	370	9	0.78	20	1230	54	76	0.24	171	< 10	162		
19576	205	294	0.64	75	26	0.10	16	1520	80	13	0.17	250	< 10	124		
19577	205	294	0.17	640	< 1	5.27	2	530	8	188	0.16	15	< 10	12		
19578	205	294	2.69	900	5	4.29	38	790	< 2	346	0.44	177	< 10	70		
19579	205	294	1.71	525	26	5.57	14	1300	10	309	0.38	112	< 10	98		
19580	205	294	2.87	1235	3	2.74	25	1200	24	338	0.54	250	< 10	154		
19581	205	294	1.90	715	< 1	3.26	5	1310	8	423	0.55	127	< 10	62		
19582	205	294	0.02	25	1	0.02	4	160	4	3	0.01	9	< 10	6		
19583	205	294	2.51	1000	< 1	3.71	35	1020	< 2	238	0.48	208	< 10	118		
19584	205	294	0.90	215	60	0.11	49	6040	22	31	0.22	856	< 10	80		
19585	205	294	0.06	25	2	4.48	5	40	4	62	0.03	2	< 10	4		
19586	205	294	3.61	1245	321	0.29	299	1840	12	82	0.16	134	150	470		
19587	205	294	4.26	1440	225	0.31	329	3220	4	49	0.15	146	< 50	212		
19588	205	294	3.32	1065	884	0.19	415	4550	4	16	0.17	168	< 50	240		
19589	205	294	4.14	1705	92	0.28	335	2790	6	105	0.15	235	50	988		
19590	205	294	3.90	3410	4	0.27	107	410	384	244	0.11	138	10	160		
19591	205	294	1.74	4490	377	0.13	161	1810	1760	238	0.06	124	20	124		
19592	205	294	0.58	130	3	2.37	8	1420	14	633	0.56	205	< 10	28		
19593	205	294	1.64	355	20	>10.00	33	2740	42	904	1.09	487	< 10	40		

CERTIFICATION: B. Caughlin

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Certificate Date: 31-AUG-91
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SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Au FA oz/T	Ag ppm AAS	Al % (ICP)	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Ca % (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	K % (ICP)
19594	205	294	< 5	-----	< 0.2	8.28	1790	< 0.5	< 2	2.12	< 0.5	9	19	112	5.68	3.22
19595	205	294	< 5	-----	< 0.2	5.43	870	< 0.5	< 2	3.20	< 0.5	16	137	81	5.22	1.52
19596	205	294	< 5	-----	1.6	1.81	110	< 0.5	< 2	0.27	0.5	109	96	1505	19.00	0.38
19597	205	294	< 5	-----	0.8	0.19	10	< 0.5	2	0.06	45.0	3	219	659	0.72	0.04
19598	205	294	30	-----	1.4	9.30	3270	2.5	< 2	0.75	< 0.5	8	28	1385	1.49	8.97
19599	205	294	< 5	-----	< 0.2	5.52	770	< 0.5	< 2	1.28	< 0.5	9	133	205	3.11	1.09
19751	205	294	< 5	-----	< 0.2	9.05	520	< 0.5	< 2	2.07	< 0.5	13	50	156	6.70	0.94
19753	205	294	< 5	-----	< 0.2	6.63	180	< 0.5	< 2	7.32	< 0.5	17	102	21	2.97	0.36
19755	205	294	< 5	-----	< 0.2	7.31	350	2.0	< 2	7.16	< 0.5	33	381	137	7.39	4.33
19756	205	294	< 5	-----	< 0.2	8.70	770	< 0.5	< 2	2.42	< 0.5	10	53	90	5.05	0.62
19757	205	294	480	-----	0.6	5.89	430	< 0.5	< 2	0.25	< 0.5	1	131	43	4.43	2.83
19758	205	294	< 5	-----	< 0.2	10.60	420	< 0.5	< 2	2.90	< 0.5	18	63	98	7.29	0.86
19759	205	294	< 5	-----	< 0.2	9.40	1070	1.0	< 2	1.83	< 0.5	9	56	34	5.77	1.54
19760	205	294	< 5	-----	< 0.2	8.78	2670	1.0	< 2	1.52	< 0.5	6	80	20	3.47	3.40
19761	205	294	1250	0.042	20.0	3.39	230	< 0.5	< 20	0.12	< 0.5	19	70	>10000	19.20	0.55
19762	205	294	5	-----	2.4	3.31	1260	< 0.5	< 2	0.20	0.5	46	147	1280	3.09	1.42
19763	205	294	160	-----	3.0	5.46	350	< 0.5	< 2	0.28	1.0	148	129	8550	7.28	3.00
19764	205	294	< 5	-----	< 0.2	6.31	2560	< 0.5	< 2	0.26	< 0.5	7	120	415	4.08	2.97
19765	205	294	< 5	-----	< 0.2	1.39	480	< 0.5	< 2	0.24	< 0.5	9	242	899	1.10	0.50
19766	205	294	< 5	-----	< 0.2	5.02	2020	< 0.5	< 2	0.25	< 0.5	11	130	1965	4.09	2.54
19767	205	294	100	-----	7.2	2.85	360	< 0.5	< 20	1.54	2.0	78	49	>10000	>25.0	1.71
19768	205	294	< 5	-----	< 0.2	7.04	590	0.5	4	8.71	< 0.5	14	72	221	5.33	1.31
19769	205	294	210	-----	8.0	9.10	1500	< 0.5	< 20	7.44	6.5	156	115	>10000	>25.0	3.76
19773	205	294	< 5	-----	< 0.2	7.93	190	0.5	< 2	1.04	< 0.5	32	661	216	6.35	2.58
19774	205	294	< 5	-----	< 0.2	10.15	370	3.0	< 2	0.73	< 0.5	18	87	135	6.95	6.11
19775	205	294	15	-----	0.4	6.87	660	0.5	< 2	0.20	< 0.5	6	45	26	3.83	4.19
19776	205	294	130	-----	0.2	9.08	270	2.0	< 2	0.68	< 0.5	12	87	89	7.26	5.69
19777	205	294	< 5	-----	< 0.2	9.11	2050	0.5	< 2	0.41	< 0.5	4	34	62	3.65	3.22
19778	205	294	< 5	-----	< 0.2	9.69	2300	1.0	< 2	0.69	< 0.5	7	23	55	3.58	3.73
19780	205	294	< 5	-----	< 0.2	8.48	2460	1.0	< 2	0.20	< 0.5	5	53	45	3.17	5.23
19781	205	294	< 5	-----	< 0.2	6.52	370	0.5	< 2	6.23	0.5	31	623	99	6.42	0.81
19782	205	294	< 5	-----	< 0.2	6.90	320	< 0.5	< 2	6.32	0.5	24	432	99	5.86	0.74
19783	205	294	< 5	-----	< 0.2	8.38	630	1.5	< 2	2.54	0.5	12	84	55	4.75	0.78
19784	205	294	< 5	-----	< 0.2	6.59	630	< 0.5	< 2	5.86	< 0.5	17	384	57	5.65	0.97
19785	205	294	< 5	-----	< 0.2	7.26	1160	2.0	< 2	2.94	< 0.5	8	101	59	4.36	1.45
19787	205	294	< 5	-----	< 0.2	8.70	1310	1.0	< 2	2.91	< 0.5	10	70	26	4.12	2.00
19788	205	294	< 5	-----	< 0.2	5.25	290	< 0.5	< 2	7.01	0.5	29	842	53	6.17	0.66
19790	205	294	< 5	-----	< 0.2	8.54	820	0.5	< 2	4.38	< 0.5	9	97	62	5.34	1.09
19791	205	294	< 5	-----	< 0.2	7.26	1220	1.5	< 2	1.31	< 0.5	10	80	28	3.69	1.30
19792	205	294	< 5	-----	< 0.2	5.99	60	< 0.5	< 2	0.34	< 0.5	14	170	4	4.47	0.09

CERTIFICATION: B. Caghi

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: HECLA MINING COMPANY

1112 GLACIER AVE.
JUNEAU, ALASKA
99801

Project : GRANDUC
Comments: ATTN: PHIL ANDERSON CC: WALTER MELNYK

Certificate Date: 31-AUG-91
Invoice No. :I9120289
P.O. Number :SF49001

CERTIFICATE OF ANALYSIS A9120289

SAMPLE DESCRIPTION	PREP CODE		Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)		
19594	205	294	2.77	1215	2	2.90	8	1530	6	822	0.46	218	< 10	72		
19595	205	294	3.39	1055	< 1	1.58	27	1400	6	552	0.32	179	< 10	62		
19596	205	294	0.98	320	21	0.20	477	170	4	36	0.08	154	< 10	72		
19597	205	294	0.07	125	2	0.03	10	40	224	9	< 0.01	5	< 10	5480		
19598	205	294	0.25	205	6	0.97	9	150	20	1240	0.13	163	< 10	64		
19599	205	294	0.87	325	1	2.29	9	480	4	298	0.35	66	< 10	56		
19751	205	294	2.01	1315	1	3.72	15	1110	< 2	239	0.65	244	< 10	134		
19753	205	294	1.65	995	1	4.09	60	490	4	276	0.22	74	< 10	24		
19755	205	294	3.77	6210	< 1	0.35	71	930	10	141	0.25	219	20	82		
19756	205	294	1.85	850	1	3.20	15	810	8	513	0.56	151	< 10	88		
19757	205	294	0.68	125	1	0.21	13	180	40	20	0.28	149	< 10	44		
19758	205	294	2.85	1165	< 1	3.68	20	980	< 2	398	0.63	272	< 10	96		
19759	205	294	2.36	1505	< 1	3.30	20	1410	18	418	0.86	145	< 10	244		
19760	205	294	1.24	460	< 1	3.07	7	1430	6	789	0.52	74	< 10	54		
19761	205	294	1.45	545	16	0.15	35	1070	24	13	0.23	171	10	318		
19762	205	294	1.02	310	15	0.12	23	870	66	25	0.20	123	< 10	92		
19763	205	294	1.34	340	6	0.42	27	930	10	54	0.30	126	< 10	158		
19764	205	294	2.04	340	< 1	0.64	39	560	8	58	0.50	147	< 10	78		
19765	205	294	0.58	230	< 1	0.03	10	300	6	10	0.09	46	< 10	28		
19766	205	294	1.42	390	5	0.32	29	470	10	29	0.34	121	< 10	98		
19767	205	294	0.78	940	150	0.29	34	450	124	121	0.14	245	< 50	200		
19768	205	294	2.16	1800	1	1.80	21	1490	4	382	0.44	213	< 10	70		
19769	205	294	3.98	2450	55	0.83	72	2190	820	165	0.42	630	50	1000		
19773	205	294	2.95	425	1	1.46	157	1020	20	229	0.36	230	< 10	42		
19774	205	294	1.70	645	< 1	0.43	15	2410	10	158	0.63	229	< 10	62		
19775	205	294	0.92	500	< 1	1.48	3	840	10	94	0.22	86	< 10	40		
19776	205	294	0.94	430	< 1	0.34	16	1630	20	184	0.67	263	< 10	42		
19777	205	294	1.02	485	< 1	3.97	2	1520	24	181	0.35	76	< 10	46		
19778	205	294	1.21	580	< 1	3.81	3	1630	6	195	0.43	84	< 10	44		
19780	205	294	1.22	465	9	1.53	11	730	32	140	0.28	96	< 10	110		
19781	205	294	6.57	1390	< 1	1.89	187	860	< 2	254	0.38	235	10	90		
19782	205	294	5.18	1205	< 1	2.07	130	840	< 2	308	0.41	233	< 10	76		
19783	205	294	2.33	945	< 1	2.70	28	970	10	537	0.53	152	< 10	98		
19784	205	294	4.87	1345	< 1	1.50	87	890	< 2	259	0.43	205	< 10	90		
19785	205	294	1.98	855	1	2.02	21	1010	8	374	0.56	139	< 10	84		
19787	205	294	1.52	620	< 1	3.10	10	2050	20	786	0.71	86	< 10	90		
19788	205	294	8.16	1240	< 1	1.06	216	730	< 2	190	0.31	208	10	84		
19790	205	294	2.57	1120	< 1	2.99	17	1210	8	468	0.67	166	< 10	88		
19791	205	294	1.61	515	< 1	1.66	24	500	2	240	0.38	95	< 10	64		
19792	205	294	1.80	855	1	2.92	95	1020	10	126	0.37	240	< 10	104		

CERTIFICATION: B. Caughlin

Chemex Labs Ltd.

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To: HECLA MINING COMPANY

1112 GLACIER AVE.
JUNEAU, ALASKA
99801

Page Number :3-A
Total Pages :4
Certificate Date: 31-AUG-91
Invoice No. :I9120289
P.O. Number :SF49001

Project : GRANDUC
Comments: ATTN: PHIL ANDERSON CC: WALTER MELNYK

CERTIFICATE OF ANALYSIS A9120289

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Au FA oz/T	Ag ppm AAS	Al % (ICP)	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Ca % (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	K % (ICP)
19795	205	294	15	-----	< 0.2	0.54	10	< 0.5	< 2	0.44	< 0.5	< 1	96	62	>25.0	0.06
19797	205	294	110	-----	7.8	3.91	180	< 0.5	< 2	0.37	0.5	397	107	416	>25.0	1.87
19800	205	294	20	-----	2.8	1.25	80	< 0.5	< 2	0.79	13.0	184	87	3330	>25.0	0.18
19801	205	294	< 5	-----	< 0.2	10.10	2220	< 0.5	< 2	2.57	2.0	54	40	7820	6.21	2.94
19802	205	294	< 5	-----	< 0.2	10.65	1880	< 0.5	< 2	3.11	2.0	18	92	756	5.43	2.56
19803	205	294	< 5	-----	< 0.2	8.13	1390	< 0.5	6	1.25	7.0	21	82	3790	4.48	2.58
19804	205	294	< 5	-----	< 0.2	0.77	110	< 0.5	10	0.66	2.0	7	136	156	1.41	0.20
19805	205	294	< 5	-----	0.8	5.81	1840	< 0.5	4	1.25	4.0	27	67	1835	3.67	2.14
19806	205	294	< 5	-----	2.0	3.21	2110	< 0.5	18	0.60	4.5	12	130	410	1.80	1.69
19807	205	294	< 5	-----	< 0.2	3.79	1760	< 0.5	12	0.10	< 0.5	3	161	148	3.25	1.60
19808	205	294	15	-----	< 0.2	3.48	1140	< 0.5	10	0.08	< 0.5	6	139	204	2.55	1.22
19809	205	294	< 5	-----	< 0.2	4.92	2790	< 0.5	6	0.13	< 0.5	3	131	133	2.63	1.65
19810	205	294	< 5	-----	0.6	4.99	2150	< 0.5	8	0.08	0.5	4	151	213	3.16	1.68
19811	205	294	< 5	-----	1.0	5.72	1980	< 0.5	10	0.21	0.5	5	115	189	4.14	1.94
19812	205	294	< 5	-----	3.4	3.41	1910	< 0.5	12	0.30	0.5	< 1	137	452	4.15	1.40
19813	205	294	< 5	-----	0.8	6.58	1610	< 0.5	6	0.75	2.5	16	60	112	4.41	1.60
19814	205	294	20	-----	10.2	5.66	1100	< 0.5	< 2	2.87	3.0	45	76	7640	5.53	1.53
19815	205	294	45	-----	5.6	4.78	1450	< 0.5	< 20	0.30	0.5	42	119	>10000	7.06	1.73
19816	205	294	10	-----	1.8	6.19	2560	< 0.5	< 2	0.67	1.5	61	96	3520	4.72	1.97
19817	205	294	85	-----	8.6	4.13	940	< 0.5	20	0.62	2.0	65	92	>10000	10.45	1.41
19818	205	294	70	-----	7.4	6.84	1580	< 0.5	< 20	2.22	4.0	61	58	>10000	8.43	1.81
19819	205	294	60	-----	3.6	5.24	2560	< 0.5	16	1.20	1.5	70	87	5920	5.72	1.55
19820	205	294	50	-----	2.2	6.12	2140	< 0.5	6	1.00	1.0	40	94	5280	6.10	1.94
19821	205	294	245	-----	10.8	4.78	250	< 0.5	< 20	2.17	1.5	58	49	>10000	17.80	1.86
19822	205	294	65	-----	2.4	3.95	610	< 0.5	< 2	13.30	3.5	25	54	4710	3.87	0.98
19823	205	294	5	-----	< 0.2	6.35	780	< 0.5	< 2	9.58	0.5	10	46	220	5.66	1.64
19824	205	294	< 5	-----	< 0.2	7.76	770	0.5	< 2	5.84	< 0.5	12	42	173	4.91	1.85
19825	205	294	< 5	-----	< 0.2	5.48	640	0.5	4	7.24	< 0.5	8	89	72	4.10	1.41
19826	205	294	50	-----	1.4	4.57	2900	< 0.5	< 2	1.91	1.0	60	75	9300	17.40	3.33
19827	205	294	50	-----	2.2	4.97	830	< 0.5	10	1.08	0.5	49	111	8040	5.50	2.95
19828	205	294	25	-----	0.6	5.26	1740	0.5	6	1.52	1.0	38	91	4770	4.39	1.84
19829	205	294	< 5	-----	< 0.2	5.59	1100	< 0.5	10	1.56	1.0	33	76	3010	4.34	1.29
19830	205	294	< 5	-----	0.4	5.82	2730	0.5	14	0.22	0.5	11	73	175	3.90	1.77
19831	205	294	< 5	-----	< 0.2	4.74	3600	< 0.5	10	0.09	< 0.5	2	69	81	3.63	1.57
19832	205	294	20	-----	2.4	5.41	310	< 0.5	< 2	4.65	0.5	16	1110	4010	8.02	1.61
19833	205	294	1130	0.028	>100.0	5.45	90	< 0.5	< 20	2.74	12.5	132	168	>10000	12.60	1.69
19834	205	294	135	-----	4.8	3.67	160	< 0.5	< 20	5.56	1.0	30	620	>10000	8.11	0.69
19835	205	294	150	-----	4.0	5.37	350	< 0.5	< 2	4.35	< 0.5	31	606	3930	7.14	1.40
19836	205	294	290	-----	7.8	4.01	140	< 0.5	< 20	3.85	1.5	57	773	>10000	7.71	1.82
19837	205	294	10	-----	1.0	5.67	140	< 0.5	< 2	9.77	25.0	316	172	3400	>25.0	0.79

CERTIFICATION: B. Caughlin

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
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To: HECLA MINING COMPANY

1112 GLACIER AVE.
JUNEAU, ALASKA
99801

Certificate Date: 31-AUG-91
Invoice No. :I9120289
P.O. Number :SF49001

Project : GRANDUC
Comments: ATTN: PHIL ANDERSON CC: WALTER MELNYK

CERTIFICATE OF ANALYSIS A9120289

SAMPLE DESCRIPTION	PREP CODE		Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)		
19795	205	294	0.22	100	1	0.34	40	< 10	4	14	0.01	< 1	< 50	38		
19797	205	294	0.56	200	2	0.45	74	630	256	22	0.09	190	< 50	104		
19800	205	294	1.04	745	1	0.04	124	150	76	12	0.04	34	< 50	1750		
19801	205	294	1.76	1670	< 1	2.76	21	1570	30	364	0.50	234	< 10	508		
19802	205	294	2.53	1225	< 1	2.96	38	1570	20	402	0.53	265	< 10	430		
19803	205	294	2.15	975	< 1	1.07	55	1060	28	94	0.55	226	< 10	1470		
19804	205	294	0.69	525	1	0.02	28	290	172	11	0.03	20	< 10	412		
19805	205	294	1.21	940	4	1.28	32	1000	90	95	0.34	203	< 10	532		
19806	205	294	0.57	815	2	0.15	18	220	466	23	0.12	84	< 10	576		
19807	205	294	0.61	105	11	0.32	11	590	86	20	0.18	230	< 10	92		
19808	205	294	0.81	90	3	0.60	24	220	36	40	0.14	60	< 10	80		
19809	205	294	1.15	100	2	0.66	16	510	26	61	0.22	110	< 10	68		
19810	205	294	1.26	150	3	0.63	18	460	104	42	0.21	117	< 10	128		
19811	205	294	1.42	250	13	0.90	19	1420	690	58	0.27	240	< 10	260		
19812	205	294	0.55	65	47	0.12	5	2110	1200	29	0.16	446	< 10	226		
19813	205	294	1.93	745	7	1.39	17	800	290	123	0.32	184	< 10	548		
19814	205	294	1.77	880	4	1.50	26	2140	86	147	0.38	152	< 10	300		
19815	205	294	1.63	505	27	0.39	46	1020	32	48	0.34	164	10	242		
19816	205	294	1.68	630	11	1.14	46	930	100	109	0.41	188	< 10	288		
19817	205	294	1.72	835	14	0.49	43	1170	266	47	0.30	186	20	556		
19818	205	294	2.23	1325	3	1.16	43	1080	106	126	0.41	216	10	740		
19819	205	294	2.04	860	4	0.57	33	1050	264	88	0.38	189	< 10	450		
19820	205	294	1.82	780	9	0.74	31	830	30	114	0.34	169	< 10	226		
19821	205	294	1.39	1300	152	0.74	29	620	26	112	0.23	231	10	302		
19822	205	294	1.09	1340	7	0.84	18	740	60	203	0.20	113	< 10	520		
19823	205	294	1.75	3380	1	1.29	21	1350	4	237	0.47	171	< 10	88		
19824	205	294	1.65	1860	1	1.69	16	1360	< 2	312	0.39	199	< 10	84		
19825	205	294	1.72	1845	1	1.29	21	980	2	201	0.29	141	< 10	62		
19826	205	294	1.05	1210	9	0.48	24	730	24	92	0.25	194	< 10	228		
19827	205	294	1.37	755	30	0.57	28	760	12	68	0.26	132	< 10	178		
19828	205	294	1.61	720	23	0.38	43	810	20	46	0.29	183	< 10	178		
19829	205	294	1.41	825	11	1.03	34	700	28	112	0.35	157	< 10	186		
19830	205	294	1.14	495	11	0.56	26	1020	140	49	0.24	242	< 10	206		
19831	205	294	0.92	110	8	0.20	14	790	106	21	0.17	314	< 10	126		
19832	205	294	10.30	1660	< 1	0.48	503	1060	< 2	15	0.27	174	30	220		
19833	205	294	4.37	1150	2	1.14	638	4900	750	75	0.24	170	150	2520		
19834	205	294	6.99	1050	< 1	0.59	305	2920	< 2	89	0.17	233	< 50	106		
19835	205	294	6.48	1020	4	1.35	260	1060	4	136	0.22	219	10	100		
19836	205	294	7.40	1235	2	0.27	357	600	< 2	67	0.20	219	50	204		
19837	205	294	2.18	1665	215	0.96	193	240	18	981	0.28	587	50	1710		

CERTIFICATION: B. Caughlin

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19838	205 294	20	-----	< 0.2	7.56	1390	< 0.5	4	4.43	2.0	25	163	2500	6.15	1.22
19839	205 294	45	-----	< 0.2	7.82	1300	< 0.5	4	3.68	1.5	23	130	2510	4.70	1.37
19840	205 294	50	-----	< 0.2	8.60	890	< 0.5	< 2	4.28	1.5	28	92	2320	5.75	1.11
19841	205 294	< 5	-----	< 0.2	8.40	930	< 0.5	< 2	4.38	2.5	32	116	5560	6.23	1.14
19842	205 294	< 5	-----	< 0.2	8.76	820	0.5	< 2	5.58	1.0	16	119	1295	5.58	1.15
19843	205 294	< 5	-----	< 0.2	9.31	850	< 0.5	< 2	4.23	0.5	21	142	2900	6.13	1.17
19844	205 294	< 5	-----	< 0.2	8.31	1190	< 0.5	< 20	3.61	3.0	45	163	>10000	5.91	1.04
19845	205 294	< 5	-----	< 0.2	7.62	1420	< 0.5	< 20	3.91	2.0	33	155	>10000	5.55	1.13
19846	205 294	< 5	-----	< 0.2	7.54	1250	< 0.5	< 2	4.74	1.0	27	166	1990	4.92	0.89
19847	205 294	50	-----	1.6	7.01	870	0.5	< 2	4.11	1.0	30	151	4530	4.85	0.90
19848	205 294	10	-----	< 0.2	7.96	1840	< 0.5	2	4.03	0.5	23	135	4870	4.95	1.17
19849	205 294	< 5	-----	< 0.2	8.99	760	< 0.5	< 2	3.82	0.5	20	114	2990	6.38	1.48
19850	205 294	< 5	-----	< 0.2	5.49	790	< 0.5	< 2	12.30	1.5	24	81	594	4.12	0.70
19851	205 294	140	-----	1.4	1.73	160	< 0.5	6	2.22	24.0	9	208	207	1.52	0.48
19852	205 294	770	-----	22.4	0.28	20	< 0.5	34	0.30	1.0	7	274	475	4.44	0.05
19853	205 294	50	-----	0.4	9.89	540	< 0.5	< 2	3.85	0.5	10	49	196	5.33	1.91
19854	205 294	< 5	-----	< 0.2	10.05	380	< 0.5	< 2	4.14	< 0.5	8	49	119	5.09	0.81
19855	205 294	< 5	-----	< 0.2	1.50	860	< 0.5	2	0.43	< 0.5	8	165	43	1.45	0.43
19856	205 294	< 5	-----	< 0.2	9.88	910	< 0.5	< 2	3.35	< 0.5	9	51	114	8.45	1.90
19857	205 294	15	-----	0.4	11.05	1110	< 0.5	< 2	3.00	< 0.5	10	59	245	9.71	2.31
19858	205 294	5040	0.154	>100.0	0.84	50	< 0.5	370	0.40	30.0	30	221	6930	7.84	0.23
19859	205 294	10	-----	1.2	8.72	110	< 0.5	< 2	2.65	0.5	18	62	337	9.26	2.07
19860	205 294	430	-----	5.8	3.43	210	< 0.5	2	1.60	10.0	10	305	254	3.08	1.25
19861	205 294	< 5	-----	< 0.2	11.65	1280	< 0.5	< 2	2.65	< 0.5	14	45	35	5.92	2.24
19862	205 294	< 5	-----	< 0.2	9.83	1780	< 0.5	< 2	3.11	0.5	13	71	64	4.67	2.72
19863	205 294	< 5	-----	< 0.2	9.95	910	< 0.5	< 2	2.60	< 0.5	11	48	30	4.83	2.19
19864	205 294	< 5	-----	< 0.2	10.95	1090	< 0.5	< 2	2.93	< 0.5	11	47	34	5.20	2.38
19865	205 294	400	-----	< 0.2	10.35	1100	< 0.5	< 2	2.46	< 0.5	9	57	163	3.13	1.73
19901	205 294	< 5	-----	< 0.2	8.79	1500	< 0.5	< 2	5.00	< 0.5	15	21	219	5.08	2.34
19902	205 294	< 5	-----	< 0.2	9.48	920	< 0.5	< 2	5.32	< 0.5	15	17	98	5.08	3.38
19903	205 294	65	-----	1.0	9.07	620	< 0.5	< 2	4.44	10.0	14	20	147	4.64	3.19
19904	205 294	< 5	-----	< 0.2	6.57	1960	< 0.5	< 2	0.09	< 0.5	1	95	6	1.12	4.22
19905	205 294	< 5	-----	< 0.2	6.99	1990	< 0.5	< 2	0.06	< 0.5	1	75	8	1.46	3.98
19906	205 294	< 5	-----	< 0.2	7.11	1870	< 0.5	< 2	0.06	< 0.5	< 1	80	3	1.30	3.96
19907	205 294	< 5	-----	< 0.2	6.97	1360	< 0.5	< 2	0.12	< 0.5	1	137	10	1.38	2.83
19951	205 294	780	-----	>100.0	0.11	10	< 0.5	3620	0.02	5.5	9	196	>10000	>25.0	0.03
19952	205 294	650	-----	24.2	0.99	20	< 0.5	< 20	5.71	45.0	258	45	>10000	21.1	0.16

CERTIFICATION: B. Caughlin

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: HECLA MINING COMPANY

1112 GLACIER AVE.
JUNEAU, ALASKA
99801

Project : GRANDUC
Comments: ATTN: PHIL ANDERSON CC: WALTER MELNYK

Certificate Date: 31-AUG-91
Invoice No. :I9120289
P.O. Number :SF49001

CERTIFICATE OF ANALYSIS A9120289

SAMPLE DESCRIPTION	PREP CODE	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)		
19838	205 294	2.32	1050	5	2.40	49	980	< 2	351	0.41	194	< 10	456		
19839	205 294	1.79	865	1	2.64	37	980	< 2	260	0.42	176	< 10	388		
19840	205 294	2.14	1070	1	2.81	35	1090	10	298	0.45	179	< 10	332		
19841	205 294	2.18	1150	< 1	2.41	47	1060	6	330	0.50	217	< 10	690		
19842	205 294	2.00	1060	< 1	2.27	27	1230	< 2	440	0.42	167	< 10	190		
19843	205 294	2.50	1125	1	2.68	34	1240	6	380	0.52	199	< 10	352		
19844	205 294	2.53	1450	1	2.50	54	940	4	302	0.49	208	10	934		
19845	205 294	2.43	1470	< 1	2.35	47	870	< 2	308	0.43	204	10	610		
19846	205 294	2.19	1245	1	2.57	37	1460	< 2	328	0.42	194	< 10	336		
19847	205 294	2.18	1065	< 1	2.32	44	1010	< 2	445	0.40	200	< 10	386		
19848	205 294	2.43	1115	< 1	2.76	44	970	< 2	342	0.45	193	< 10	344		
19849	205 294	3.73	1025	< 1	2.22	39	1630	< 2	338	1.05	171	< 10	326		
19850	205 294	2.36	840	2	1.50	32	1320	< 2	326	0.51	139	< 10	308		
19851	205 294	0.50	295	2	0.71	10	460	1280	112	0.06	43	< 10	3700		
19852	205 294	0.27	290	9	0.04	9	110	6000	9	0.01	10	140	54		
19853	205 294	1.42	1195	< 1	1.96	3	1600	134	402	0.55	98	< 10	74		
19854	205 294	1.34	960	2	3.90	3	1520	20	447	0.50	130	< 10	52		
19855	205 294	0.59	525	1	0.22	44	240	18	28	0.08	39	< 10	40		
19856	205 294	1.68	1265	< 1	1.82	4	2300	10	232	0.59	193	< 10	68		
19857	205 294	2.09	1525	< 1	1.88	7	1830	10	290	0.65	203	< 10	98		
19858	205 294	0.31	585	15	0.06	14	270	>10000	34	0.05	18	440	200		
19859	205 294	1.34	610	5	1.55	13	1800	224	207	0.45	157	< 10	50		
19860	205 294	0.76	630	49	0.41	58	1650	3200	154	0.13	512	10	978		
19861	205 294	1.27	790	2	2.20	13	1230	32	475	0.58	156	< 10	96		
19862	205 294	1.37	830	< 1	2.09	22	1380	38	628	0.40	150	< 10	122		
19863	205 294	1.08	565	< 1	1.86	13	1040	24	352	0.46	118	< 10	96		
19864	205 294	1.08	685	< 1	1.84	12	1030	20	411	0.52	136	< 10	94		
19865	205 294	0.87	445	< 1	4.49	2	720	10	759	0.26	77	< 10	56		
19901	205 294	1.22	1005	1	3.24	9	1610	8	403	0.35	172	< 10	60		
19902	205 294	1.34	1110	1	2.27	6	1250	8	327	0.35	173	< 10	72		
19903	205 294	1.29	1665	< 1	2.39	10	1090	710	273	0.30	146	< 10	758		
19904	205 294	0.23	85	1	1.56	1	100	14	152	0.09	< 1	< 10	28		
19905	205 294	0.14	50	2	2.16	1	170	24	100	0.14	19	< 10	12		
19906	205 294	0.10	80	4	2.24	1	80	20	99	0.11	< 1	< 10	12		
19907	205 294	0.02	15	4	3.55	3	100	46	80	0.10	< 1	< 10	68		
19951	205 294	0.03	< 5	< 1	0.04	47	< 200	>10000	2	< 0.01	< 1	< 50	134		
19952	205 294	3.17	1205	34	0.10	71	830	940	23	0.05	182	200	6040		

CERTIFICATION: B. Caplan

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
British Columbia, Canada V7J 2C1
PHONE: 604-984-0221

To: HECLA MINING COMPANY

1112 GLACIER AVE.
JUNEAU, ALASKA
99801

Project : GRANDUC
Comments: ATTN: PHIL ANDERSON cc: WALTER MELNYK

Page Number : 1-A
Total Pages : 1
Certificate Date: 02-SEP-91
Invoice No. : I9120588
P.O. Number :

CERTIFICATE OF ANALYSIS A9120588

SAMPLE DESCRIPTION	PREP CODE		Au ppb FA+AA	Ag ppm AAS	Al % (ICP)	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Ca % (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	K % (ICP)	Mg % (ICP)
19866	205	294	40	< 0.2	8.21	1360	< 0.5	< 2	4.69	< 0.5	10	91	114	4.61	2.97	1.73
19867	205	294	30	< 0.2	8.15	1440	< 0.5	< 2	4.77	< 0.5	11	108	74	4.77	2.75	1.94
19868	205	294	50	6.0	0.20	20	< 0.5	8	0.22	1.5	1	254	446	0.47	0.05	0.02
19869	205	294	40	< 0.2	8.56	780	< 0.5	< 2	5.55	< 0.5	14	114	117	4.82	2.96	2.06
19908	205	294	5	< 0.2	9.83	130	< 0.5	< 2	4.82	< 0.5	30	36	269	5.78	0.50	2.16
19909	205	294	< 5	< 0.2	3.59	40	< 0.5	< 2	4.79	< 0.5	10	132	45	8.04	0.17	0.35
19910	205	294	105	< 0.2	8.70	1620	< 0.5	< 2	4.53	< 0.5	5	73	84	5.64	2.66	2.02
19911	205	294	45	< 0.2	8.11	1420	< 0.5	< 2	4.42	0.5	10	124	79	5.84	2.26	2.66
19912	205	294	570	62.0	1.37	20	< 0.5	< 2	0.22	4.0	773	3	3350	>25.0	0.09	0.75
19913	205	294	10	1.0	7.77	180	< 0.5	< 2	3.64	0.5	3	110	108	7.32	0.41	2.00
19914	205	294	25	2.8	10.65	280	< 0.5	< 2	0.38	1.0	6	44	722	4.22	3.17	0.25

CERTIFICATION: B. Caughlin

Chemex Labs Ltd.

Analytical Chemists * Geochemists * Registered Assayers
212 Brooksbank Ave., North Vancouver
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To: HECLA MINING COMPANY

1112 GLACIER AVE.
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99801

Project : GRANDUC
Comments: ATTN: PHIL ANDERSON CC: WALTER MELNYK

Certificate Date: 02-SEP-91
Invoice No. : I9120588
P.O. Number :

CERTIFICATE OF ANALYSIS A9120588

SAMPLE DESCRIPTION	PREP CODE	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)			
19866	205 294	1095	3	3.02	14	1940	4	827	0.55	246	< 10	46			
19867	205 294	1155	1	2.86	18	1820	< 2	1060	0.50	219	< 10	54			
19868	205 294	80	1	0.03	5	30	1060	23	< 0.01	6	< 10	190			
19869	205 294	1205	1	3.09	22	2020	10	1175	0.54	245	< 10	52			
19908	205 294	540	2	3.75	12	880	< 2	423	0.48	255	< 10	32			
19909	205 294	530	6	2.15	130	390	4	96	0.11	77	< 10	16			
19910	205 294	1420	< 1	3.00	7	2060	< 2	942	0.63	283	< 10	56			
19911	205 294	1585	< 1	3.05	21	1990	< 2	766	0.64	308	< 10	90			
19912	205 294	1015	2	0.19	184	40	144	24	0.01	10	< 50	124			
19913	205 294	765	7	4.34	27	1760	2	742	0.52	295	< 10	36			
19914	205 294	200	2	5.20	29	200	16	843	0.10	5	< 10	124			

CERTIFICATION: B. Caughlin

APPENDIX D

ANALYTICAL METHODS

Chemex Labs Ltd.

Analytical Chemists *Geochemists* *Registered Assayers*

212 Brooksbank Ave.
North Vancouver, B.C.
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Phone: (604) 984-0221
Telex: 04-352597
Fax: (604) 984-0218

Crushing

The entire sample is passed through a primary crusher to yield a product of approximately 3/4" diameter. The sample particle size is then further reduced by a secondary crushing process. The Chemex specification for the final crushed product is that greater than 50% of the sample passes a -10 mesh screen. A split in the range of 150-350g (weight depends on parameters requested) is then taken.

Different crushing codes are used depending on the weight of the original sample:

Chemex Code	Sample Weight
294	Less than 10 lbs
272	11 to 20 lbs
273	21 to 30 lbs

Ring Grinding

Chemex Codes: 205 geochemical samples
208 assay samples

A crushed sample split is ground using a ring mill pulverizer with a chrome steel ring set. The Chemex specification for this procedure is that greater than 90% of the ground material passes a 150 mesh screen. Grinding with chrome steel will impart trace amounts of iron and chromium to a sample.

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Gold

Fire Assay Collection/ Atomic Absorption Spectroscopy (FA-AA)

Chemex Code: 100

A 10g sample is fused with a neutral lead oxide flux inquarted with 6mg of gold-free silver and then cupelled to yield a precious metal bead.

These beads are digested for 30 mins in 0.5ml concentrated nitric acid, then 1.5ml of concentrated hydrochloric acid are added and the mixture is digested for 1 hr. The samples are cooled, diluted to a final volume of 5ml, homogenized and analyzed by atomic absorption spectroscopy.

Detection limit: 5 ppb

Upper Limit: 10,000 ppb

Au (oz/T) - Chemex code 396

Gold analyses are done by standard fire assay techniques. In the sample preparation stage the screens are checked for metallics which, if present, are assayed separately and calculated into the results obtained from the pulp assay.

0.5 (14.583 gm) assay ton sub samples are fused in litharge, carbonate and silicious fluxes. The lead button containing the precious metals is cupelled in a muffle furnace. The Ag & Au bead is parted in dilute nitric acid, annealed and weighed as Au.

Detection limit: 0.003 oz/t

Chemex Labs Ltd.

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Fax: (604) 984-0218

Screening Procedure

Chemex Code: 201

Geochemical samples (soils,silts) are dried at 50 deg C and then sieved through an 80 mesh stainless steel screen. If insufficient material is obtained, the sample is sieved through a 35 mesh screen (code 203) and the -35 mesh material is ring pulverized (code 205).

If there is still insufficient material for analysis after sieving to -35 mesh, then the whole sample is recombined and ground (code 217).

Screening Procedure

Chemex Code: 203

Geochemical samples (soils,silts) are dried at 50 deg C. and then screened through a 35 mesh stainless steel screen. The -35 mesh material is then ring pulverized using a ring mill with either a chrome steel ring set (code 205) or a zirconia ring set (code 248). If there is insufficient -35 mesh material for analysis, then the entire sample is ground (code 217).

Chemex Labs Ltd.

Analytical Chemists *Geochemists* *Registered Assayers*

212 Brooksbank Ave.
North Vancouver, B.C.
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Phone: (604) 984-0221
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Fax: (604) 984-0218

24-Element Geochemistry Package (24-ICP)

Inductively-Coupled Plasma Atomic Emission Spectroscopy (ICP-AES)

The 24 element rock geochemistry package provides quantitative analysis of all major elements (except silicon) as well as most important trace elements.

A prepared sample (0.50g) is digested with perchloric, nitric and hydrofluoric acids to dryness. The residue is taken up in a volume of 25ml of 10% hydrochloric acid and the resulting solution is analyzed by inductively-coupled plasma atomic emission spectroscopy. Results are corrected for spectral interelement interferences.

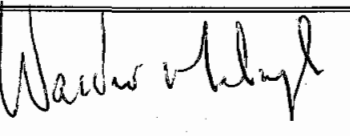
Chemex Code	Element	Detection Limit	Upper Limit
573	Aluminum	0.01 %	25 %
565	Barium	10 ppm	1 %
575	Beryllium	0.5 ppm	1 %
561	Bismuth	2 ppm	1 %
576	Calcium	0.01 %	25 %
562	Cadmium	0.5 ppm	1 %
569	Chromium	1 ppm	1 %
563	Cobalt	1 ppm	1 %
577	Copper	1 ppm	1 %
566	Iron	0.01 %	25 %
560	Lead	1 ppm	1 %
570	Magnesium	0.01 %	20 %
568	Manganese	5 ppm	1 %
554	Molybdenum	1 ppm	1 %
564	Nickel	1 ppm	1 %
559	Phosphorus	10 ppm	1 %
584	Potassium	0.01 %	20 %
578	Silver	0.5 ppm	0.02 %
583	Sodium	0.01 %	5 %
582	Strontium	1 ppm	1 %
579	Titanium	0.01 %	1 %
556	Tungsten	10 ppm	1 %
572	Vanadium	1 ppm	1 %
558	Zinc	2 ppm	1 %

APPENDIX E

COST STATEMENT

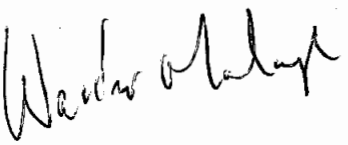
1991 COST STATEMENT

CONSULTING FEES:			
Supervising Consulting Geologist:	4 days @ $481.50	$ 1,926.00	
Consulting Geologist:	18 days @ $481.50	8,667.00	
Consulting Geologist:	15 days @ $345.00	5,175.00	
Consulting Geologist:	17 days @ $287.00	4,879.00	$ 20,647.00
TRANSPORTATION:			
Airline Tickets - 2 men Vancouver to Smithers return	2 @ $ 550.00		
Car rental	520.00	1,620.00	
Air passage - 1 man Anchorage to Stewart return			
Air passage - 1 man Juneau to Stweart return		1,233.00	2,853.00
Helicopter:			
Jet Ranger, 206B, 7 hours @ $718/hour		5,026.00	
Hughes, 500D, 12.23 hours @ $816/hour		9,979.68	15,005.68
LABORATORY COSTS:			
Soil and sediment samples: 131 @ $20.87		2,733.97	
Rock samples: 165 @ $21.77		3,592.05	6,326.02
ACCOMMODATION:			
50 mandays @ $54.16 per manday			2,708.00
MEALS:			
50 mandays @ $30.00 per manday			1,500.00
EQUIPMENT AND SUPPLIES:			
Maps		186.90	
Computer, HF radios, Kray rentals, etc.		1,000.00	1,186.90
STEWART OFFICE:			
Office rental		160.50	
Photocopying		28.46	188.96
REPORT PREPARATION:			
Consulting geologist - 11.75 days @ 481.50		5,657.63	
Technical drawing - 3 days @ $481.50		1,444.50	
Secretarial - 6 days @ $171.20		1,027.20	
Reproduction		100.00	8,229.33
TOTAL EXPENDITURES			**$ 58,644.89**



ALLOCATION OF COSTS TO CLAIM GROUPS

CLAIMS WORKED ON	GROUP	TOTAL COSTS
Audro 1, Audro 2, Blend 1, Blend 2	QUEEN	$ 5,600.00
Granduc 7, J.P. 7, McK 6, McQ, McQ 1	QUEEN-SUP	2,400.00
McQ 2, McQ 3, QUEEN 24, VK1, VK2, VK3	LEDUC	21,520.94
Bob 3, Bob 5, Bob 6, Key 12, Key 14, Key 43 Key 45, Key 135, Vaughn K5, Vaughn K6, Vaughn K7, Vaughn K8	KEY	29,123.95
TOTAL EXPENDITURES		**$ 58,644.89**



APPENDIX F

STATEMENT OF QUALIFICATIONS

STATEMENT OF QUALIFICATIONS

I, Walter D. Melnyk, of 2185 Badger Road, North Vancouver, B.C., do hereby certify that:

- I graduated from the University of Saskatchewan, Saskatoon, with at degree of B. Ap. Sc. in 1972.

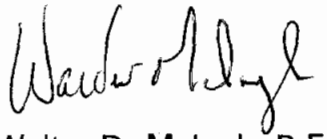
- I am a member of the Association of Professional Engineers of British Columbia and Ontario.

- I am a consulting exploration geologist.

- I have been practising my profession since graduation.

- I have not received, nor do I expect to receive any interest directly or indirectly in Hecla Mining Company.

- This report and the conclusions are based on personal examination of the property and direct supervision of the work reported herein.



Walter D. Melnyk, P.Eng.
Vancouver, B.C.
November, 1991

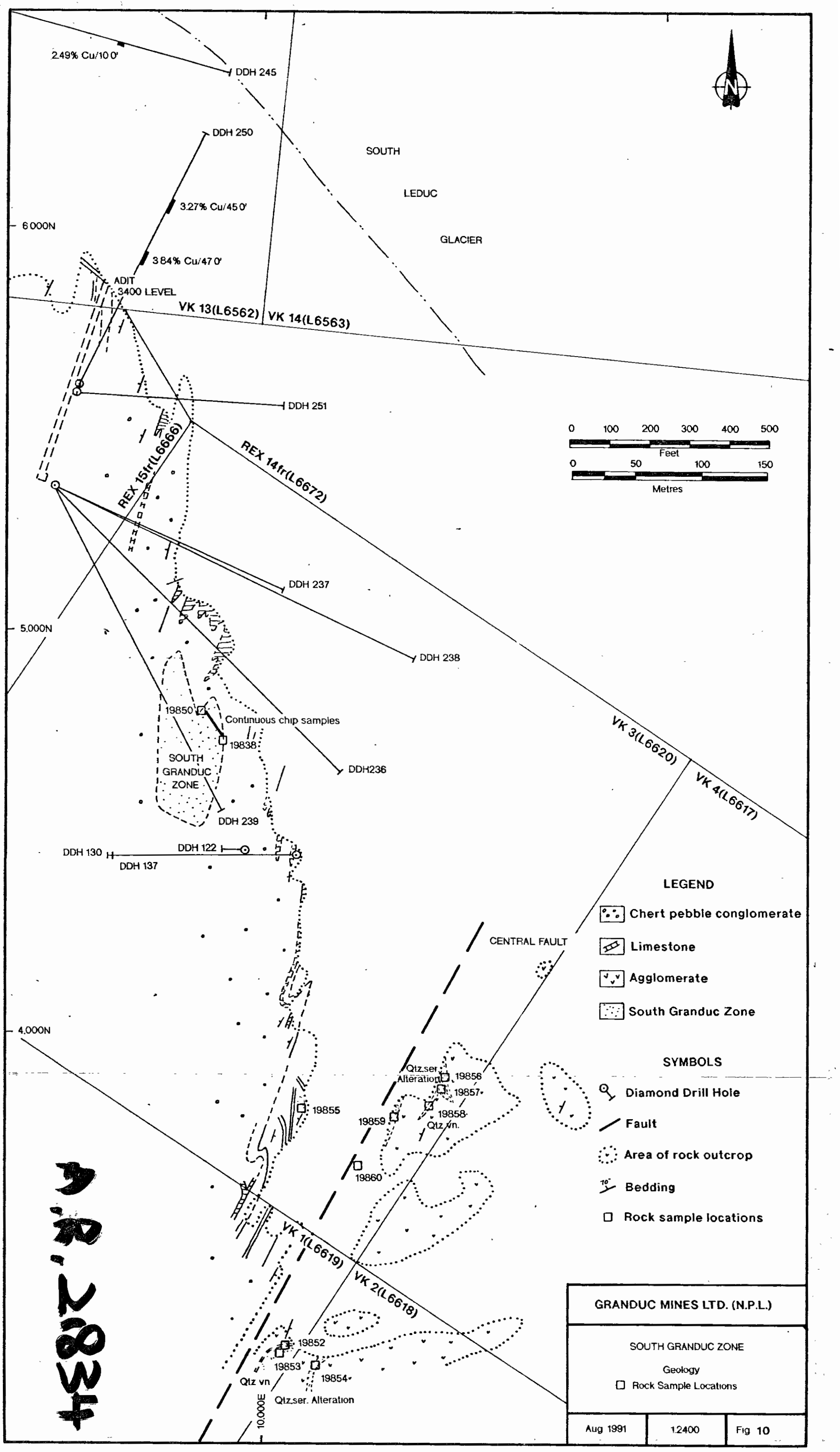


TABLE 5

SOUTH GRANDUC ZONE

GEOCHEMICAL ANALYSIS

Sample description	Au ppb FA+AA	Au FA oz/T	Ag ppm AAS	Ba ppm (ICP)	Be ppm (ICP)	Bi ppm (ICP)	Cd ppm (ICP)	Co ppm (ICP)	Cr ppm (ICP)	Cu ppm (ICP)	Fe % (ICP)	Mg % (ICP)	Mn ppm (ICP)	Mo ppm (ICP)	Na % (ICP)	Ni ppm (ICP)	P ppm (ICP)	Pb ppm AAS	Sr ppm (ICP)	Ti % (ICP)	V ppm (ICP)	W ppm (ICP)	Zn ppm (ICP)
19838	20		<0.2	1390	<0.5	4	2.0	25	163	2500	6.15	2.32	1050	5	2.40	49	980	<2	351	0.41	194	<10	456
19839	45		<0.2	1300	<0.5	4	1.5	23	130	2510	4.70	1.79	865	1	2.64	37	980	<2	260	0.42	176	<10	388
19840	50		<0.2	890	<0.5	<2	1.5	28	92	2320	5.75	2.14	1070	1	2.81	35	1090	10	298	0.45	179	<10	332
19841	<5		<0.2	930	<0.5	<2	2.5	32	116	5560	6.23	2.18	1150	<1	2.41	47	1060	6	330	0.50	217	<10	690
19842	<5		<0.2	820	0.5	<2	1.0	16	119	1295	5.58	2.00	1060	<1	2.27	27	1230	<2	440	0.42	167	<10	190
19843	<5		<0.2	850	<0.5	<2	0.5	21	142	2900	6.13	2.50	1125	1	2.68	34	1240	6	380	0.52	199	<10	352
19844	<5		<0.2	1190	<0.5	<20	3.0	45	163	>10000	5.91	2.53	1450	1	2.50	54	940	4	302	0.49	208	10	934
19845	<5		<0.2	1420	<0.5	<20	2.0	33	155	>10000	5.55	2.43	1470	<1	2.35	47	870	<2	308	0.43	204	10	610
19846	<5		<0.2	1250	<0.5	<2	1.0	27	166	1990	4.92	2.19	1245	1	2.57	37	1460	<2	328	0.42	194	<10	336
19847	50		1.6	870	0.5	<2	1.0	30	151	4530	4.85	2.18	1065	<1	2.32	44	1010	<2	445	0.40	200	<10	386
19848	10		<0.2	1840	<0.5	2	0.5	23	135	4870	4.95	2.43	1115	<1	2.76	44	970	<2	342	0.45	193	<10	344
19849	<5		<0.2	760	<0.5	<2	0.5	20	114	2990	6.38	3.73	1025	<1	2.22	39	1630	<2	338	1.05	171	<10	326
19850	<5		<0.2	790	<0.5	<2	1.5	24	81	594	4.12	2.36	840	2	1.50	32	1320	<2	326	0.51	139	<10	308
19851	140		1.4	160	<0.5	6	24.0	9	208	207	1.52	0.50	295	2	0.71	10	460	1280	112	0.06	43	<10	3700
19852	770		22.4	20	<0.5	34	1.0	7	274	475	4.44	0.27	290	9	0.04	9	110	6000	9	0.01	10	140	54
19853	50		0.4	540	<0.5	<2	0.5	10	49	196	5.33	1.42	1195	<1	1.96	3	1600	134	402	0.55	98	<10	74
19854	<5		<0.2	380	<0.5	<2	<0.5	8	49	119	5.09	1.34	960	2	3.90	3	1520	20	447	0.50	130	<10	52
19855	<5		<0.2	860	<0.5	2	<0.5	8	165	43	1.45	0.59	525	1	0.22	44	240	18	28	0.08	39	<10	40
19856	<5		<0.2	910	<0.5	<2	<0.5	9	51	114	8.45	1.68	1265	<1	1.82	4	2300	10	232	0.59	193	<10	68
19857	15		0.4	1110	<0.5	<2	<0.5	10	59	245	9.71	2.09	1525	<1	1.88	7	1830	10	290	0.65	203	<10	98
19858	5040	0.154	>100.0	50	<0.5	370	30.0	30	221	6930	7.84	0.31	585	15	0.06	14	270	>10000	34	0.05	18	440	200
19859	10		1.2	110	<0.5	<2	0.5	18	62	337	9.26	1.34	610	5	1.55	13	1800	224	207	0.45	157	<10	50
19860	430		5.8	210	<0.5	2	10.0	10	305	254	3.08	0.76	630	49	0.41	58	1650	3200	154	0.13	512	10	978