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LINECUTTING, GEOLOGICAL MAPPING

AND

GEOCHEMISTRY

ON THE

ELF SOUTH GROUP CLAIMS

NTS: 94F/7E&W

BY: TECK EXPLORATION LTD.

FOR: CIRQUE OPERATING CORP.

R. FARMER
OCTOBER 1997

SUMMARY

A program comprising linecutting, geological mapping and soil geochemical sampling was carried out on the Elf South Group claims between July 14 and July 28, 1997. Claims comprising the Elf South Group represent the southeastern portion of the Elf property. The purpose of the program was to assess the on strike potential of known mineralization on the Elf Grid and, on the Joel Creek Grid, to follow-up favourable geochemistry and geology identified previously. Detailed grid controlled geological mapping and soil geochemical sampling were carried out with a view towards identifying potential drill targets.

A total of 9.6 line kilometres of linecutting was completed on two grids. On the Elf grid three lines not cut in 1995 were completed south of Elf Creek and the grid was extended 500 metres to the northwest, adding six new lines, for a total of 4.9 line kilometres. On the Joel creek Grid, only a portion of the grid is included in the Elf South Group, totaling 4.7 line kilometres. The northwestern portion is described in a separate report.

A total of 9.6 line kilometres of grid controlled geological mapping were completed on the two grids on Elf South Group claims. Siliceous, graphitic shale containing local nodular to laminated barite and pyrite was identified on the Joel Creek Grid, trending northwest. Poor exposure prevented tracing of the sequence south of Joel Creek. In the area of the helipad at the southeast end of the baseline exposure seems much better and additional grid lines should be added to the south end of the grid where the prospective sequence may once again be exposed.

On the Elf Grid, geological mapping on lines 104N to 106N has identified two parallel belts of prospective siliceous, graphitic shale. It is not clear whether these represent two horizons or a fold repetition of a single horizon, however a fold repetition is suspected. In the northwestern extension (L112N-L117N) of the grid, extensive thick overburden prevented tracing of the sequence in that direction, particularly for the southwestern band, containing the Elf showing. The more easterly band was traced as far north as L114N before disappearing beneath extensive overburden cover. Relogging of old drill core should be completed to confirm whether the two belts of siliceous shale represent limbs of a fold or separate horizons.

A total of 355 soil samples were collected during the 1997 program, 199 from the Elf Grid and 156 from the southern portion of the Joel Creek grid. The strong multielement anomaly (Pb, Zn, Ag, Ba), associated with the Elf Showing could not be traced to the northwest, with the exception of zinc, which is continuous across all lines sampled in 1997. This may be related to iron seeps issuing from the thrust fault forming the contact with Silurian siltstone. On the southeast side, lines 104-106N, Pb, Ag and to some extent Ba extend the anomaly in that direction, but Zn is not anomalous.

On the Joel Creek grid (Elf South Group portion), there is a strong Pb, Ag +/- Ba anomaly near the eastern end of lines 140N-143N which trends off the South Group claims to the northwest. A weaker Ag +/- Pb anomaly is present between 98 and 99E on lines 136N to 134N which trends southeastwards off the grid. This anomaly may reflect the prospective stratigraphy and the grid should be extended to the southeast. Zn and Ba are peripheral to Pb and Ag over the grid area.

RECOMMENDATIONS

1. Extend the Joel Creek grid southeastwards to allow geological mapping of the Gunsteel sequence in an area of apparently good exposure.

2. Re-log existing drill core to provide details on stratigraphy and structure in the area of mineralization.

3. Upon completion of Nos. 1&2 above, diamond drill all favourable geological and geochemical targets.

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INTRODUCTION

The Elf property is located in the Akie River area, southern Kechika trough, in northeastern B.C. The property is underlain by a thick succession of black shale and chert of the Upper Devonian Gunsteel Formation, Earn Group. The Cirque deposit (30 MT @ 8% Zn, 2% Pb, 37g/t Ag), located 35 kilometres to the northwest, is hosted by these same shales. The Elf property consists of 161 contiguous units and this report describes work carried out on the southeastern portion of the property, grouped as Elf South Group (83 units).

During 1997 a program comprising linecutting, grid controlled geological mapping and soil geochemistry was carried out on the Elf South Group claims. Work was carried out on two grids; the Elf Grid and the Joel Creek Grid. The purpose of the program was; a) to fill in three lines on the Elf Grid not completed in 1995 and to extend the grid to the northwest in an attempt to trace known mineralization in that direction; b) to establish a grid in the Joel Creek area where favourable stratigraphy and baritic mineralization had been identified in 1995, to allow detailed geological mapping and soil sampling in an attempt to locate additional mineralization in this area.

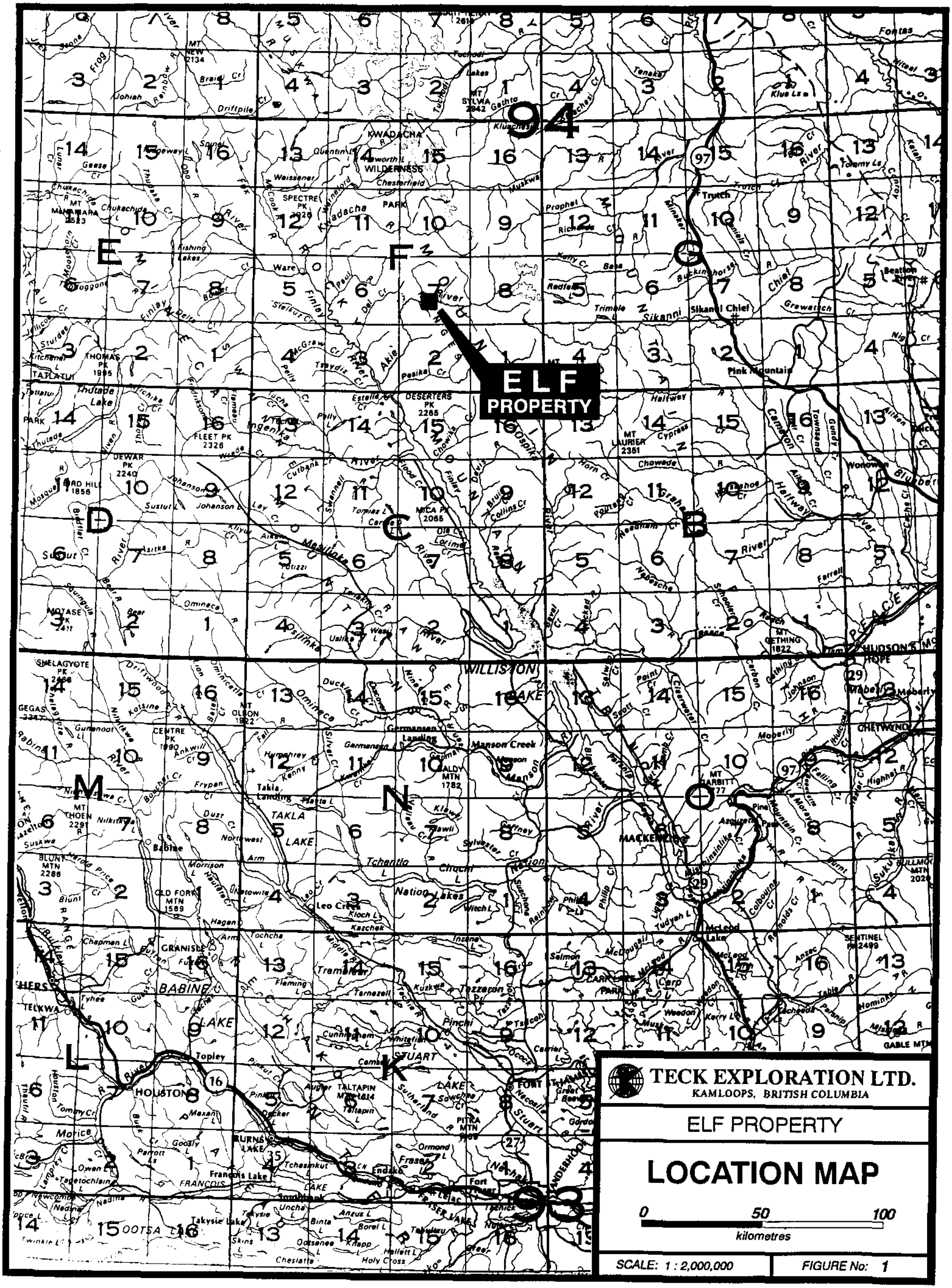
This report describes the work carried out on the Elf property, Elf South Group claims, and provides an interpretation of results obtained.

LOCATION AND ACCESS

The Elf property is located on the south slope of the Akie River, approximately 45 kilometres east-southeast of the village of Fort Ware, B.C. (figure 1). The center of the claims are located at latitude 57° 18' N, longitude 124° 42' W, on NTS mapsheets 94F/7 E&W.

Access to the property is via helicopter only, with the nearest base located at the logging camp of Finbow, 40 kilometres west of the property. Assess to Finbow camp is by fixed wing aircraft or barge from the town of Mackenzie, B.C., a distance of 250 kilometres. The 1997 program was based out of the Finbow Camp located 40 km northwest of the property, utilizing helicopter transport to the property on a daily basis.

The Elf claims cover the steep south slope of the Akie River. Slopes are generally heavily timbered with spruce and fir, higher elevations on ridge tops are above tree line. Despite heavy timber, slopes are very steep (often 30-50°), with much timber on the ground. Elevations on the property vary between 930 and 1600 metres, with several steeply incised creek valleys cutting across the predominant northwest topographic alignment.



TECK EXPLORATION LTD.

KAMLOOPS, BRITISH COLUMBIA

ELF PROPERTY

LOCATION MAP

0 50 100

kilometres

SCALE: 1 : 2,000,000

FIGURE No: 1

CLAIMS

The Elf property comprises 22 claims totaling 165 units (figure 2). The current registered owner of all claims is Cirque Operating Corp. This report concerns a portion of these claims, 11 claims totaling 83 units, comprising Elf South Group. Table 1 below provides a summary of claim statistics.

Table 1
Claim Statistics

Claim Name	Record Number	Number of Units	Owner	Expiry Date*
Elf 1	237990	6	Cirque Operating Corp.	23 Jun 98
Elf 2•	237991	6	Cirque Operating Corp.	23 Jun 2001
Elf 3	237992	4	Cirque Operating Corp.	23 Jun 98
Elf 4•	237993	10	Cirque Operating Corp.	23 Jun 2001
Elf 5•	237994	4	Cirque Operating Corp.	23 Jun 2001
Elf 6	237995	10	Cirque Operating Corp.	23 Jun 98
Elf 7•	237996	4	Cirque Operating Corp.	23 Jun 2001
Elf 8•	237997	18	Cirque Operating Corp.	23 Jun 2001
Elf 9	237998	8	Cirque Operating Corp.	23 Jun 98
Elf 10•	237999	8	Cirque Operating Corp.	23 Jun 2001
Elf 11•	238000	12	Cirque Operating Corp.	23 Jun 2001
Elf 12	238001	1	Cirque Operating Corp.	23 Jun 98
Elf 13	238007	20	Cirque Operating Corp.	18 Jul 98
Elf 14	238008	20	Cirque Operating Corp.	18 Jul 98
Elf 15	238009	2	Cirque Operating Corp.	18 Jul 98
Elf 15•	238029	9	Cirque Operating Corp.	01 Aug 2001
Elf 16•	238128	5	Cirque Operating Corp.	22 Jun 2001
Elf 17	238129	3	Cirque Operating Corp.	22 Jun 98
Elf 18	238144	4	Cirque Operating Corp.	13 Aug 98
Elf 19•	238287	4	Cirque Operating Corp.	11 Jul 2001
Elf 21•	238336	3	Cirque Operating Corp.	11 Sept 2001

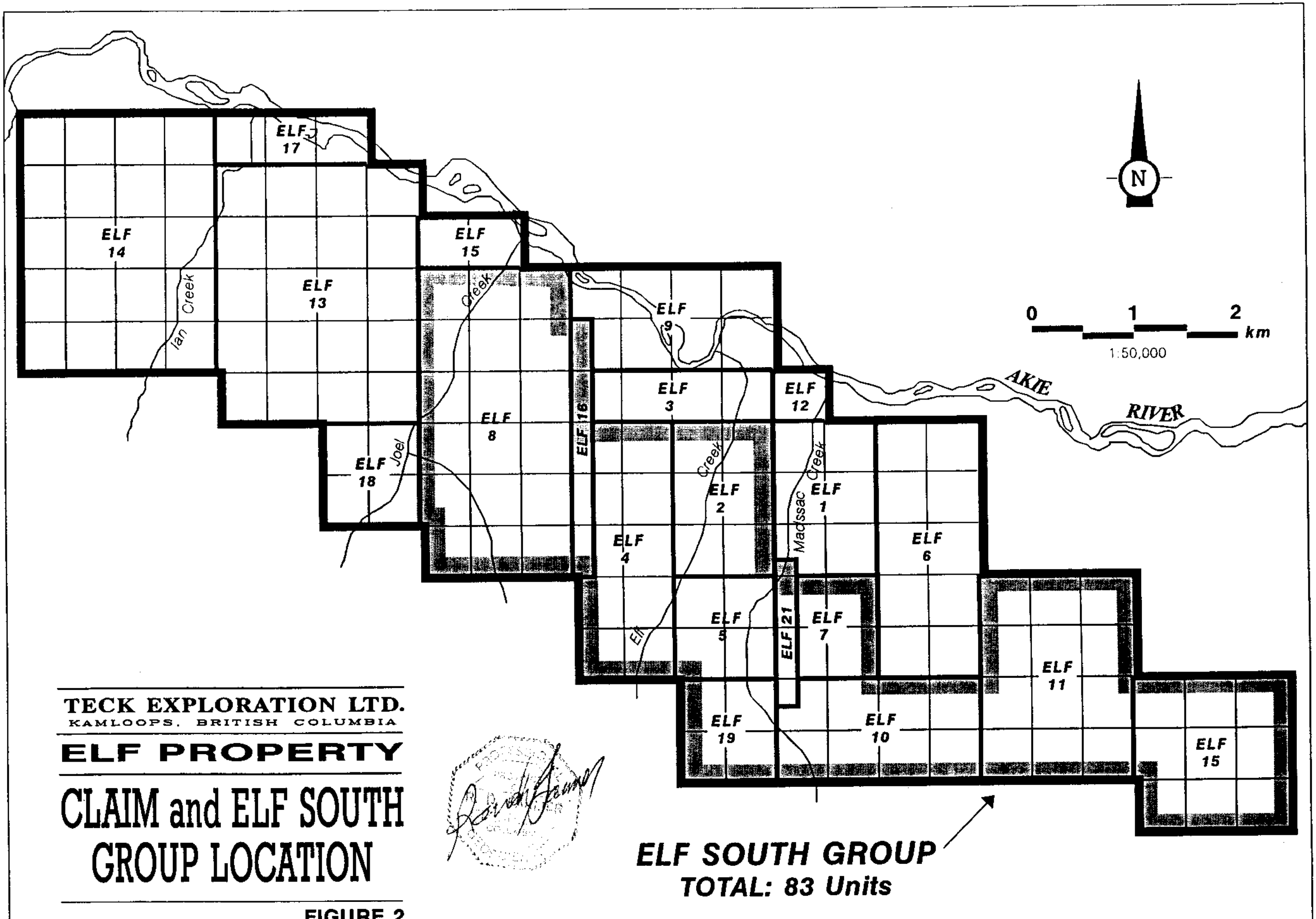
Total: 83 Units

- **Grouped as Elf South Group**

* **Expiry of Elf South Group Claims Based on Acceptance of this Report**

PREVIOUS WORK

The Elf claims were explored between 1978 and 1982 by Cyprus Anvil Mining Corporation. Work carried out during that period included, geological mapping, stream and soil geochemical sampling, linecutting, orthophoto base map construction, horizontal loop EM and diamond drilling.



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KAMLOOPS, BRITISH COLUMBIA

ELF PROPERTY

CLAIM and ELF SOUTH GROUP LOCATION

FIGURE 2

Follow-up of stream sediment anomalies and mineralized float led to the 1979 discovery of a high grade barite-lead-zinc showing in Elf Creek. Between 1979 and 1982 a total of 26 diamond drill holes (10,500 metres) were drilled on the property, 23 in the area of the Elf Creek Showing and three to test soil anomalies in the northern portion of the claims, one of these in the area now covered by the Joel Creek Grid. Significant mineralization was intersected in eight holes directly under the Elf showing, with the best being 3.65% Pb, 10.13% Zn, 27.2 g/t Ag over a true width of 10.9 metres. A further 15 holes drilled in the vicinity of the of the showing failed to intersect the mineralized horizon due to bad drilling conditions (10 holes), or intersected a barren zone at the targeted horizon (5 holes). Three holes drilled to test soil anomalies several kilometres to the northwest, failed to intersect significant mineralization. The majority of this drilling was undertaken on what is now the Elf South Group of claims.

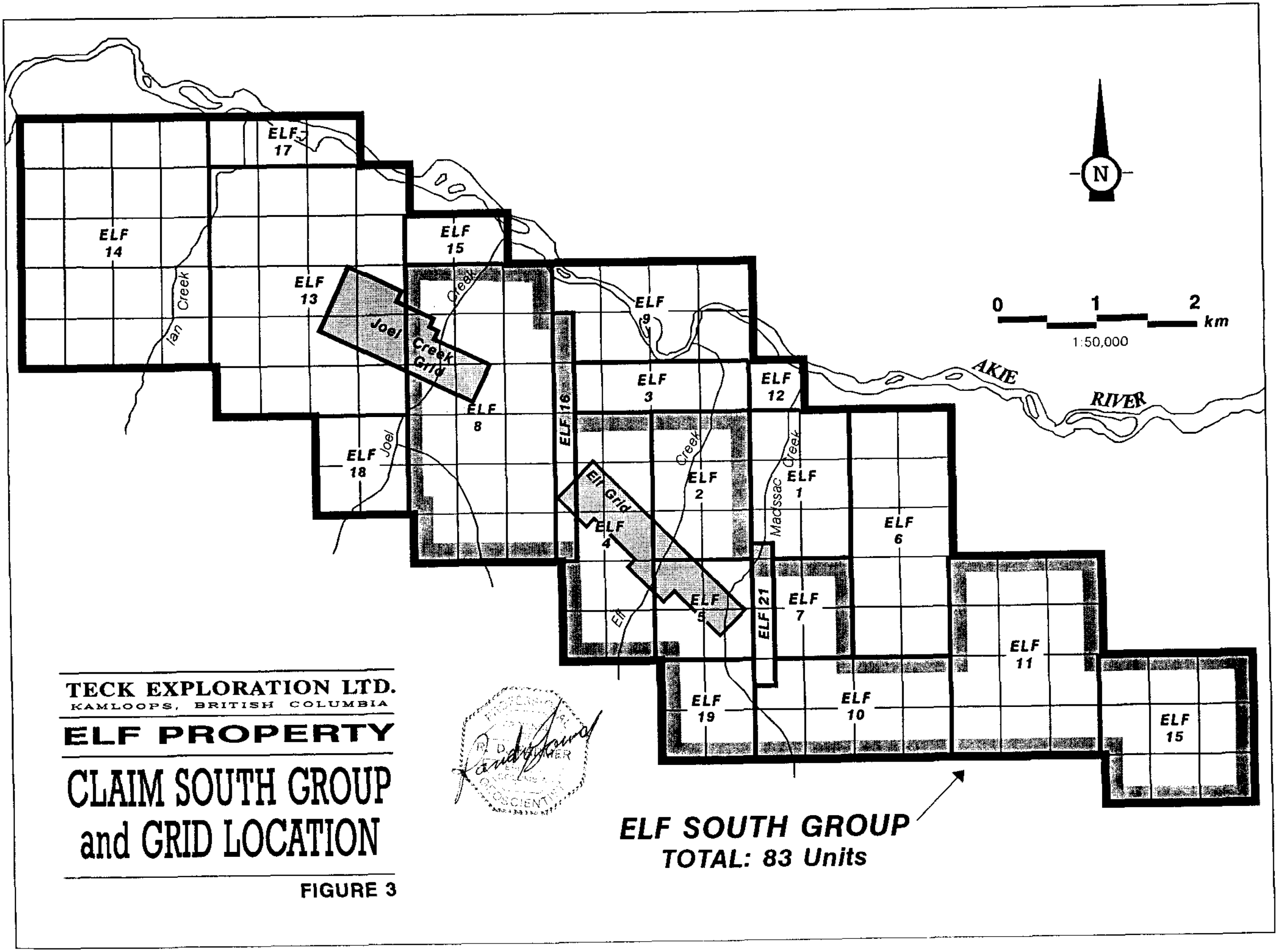
In 1995, a program comprising regional scale geological traverses, linecutting, soil geochemical sampling and grid controlled geological mapping were carried out by Teck Exploration Ltd.

CURRENT PROGRAM

During the period July 14 to July 28, 1997 a program consisting of linecutting, grid controlled geological mapping and soil geochemical sampling was carried out on two grids within the Elf South Group claims. On the Elf Grid, work comprised extending the grid to the northwest and completing three internal lines not completed in 1995. At Joel Creek, approximately 2 km to the northwest, a grid was established to cover an area of favourable stratigraphy containing barite mineralization identified in 1995. Only a portion of the Joel Creek grid is located on Elf South Group claims and that portion is reported on here (figure 3). The remainder of the grid will be reported on separately. The purpose of the program was to attempt to trace known mineralization on the Elf grid to the northwest, along strike and on the Joel Creek grid to attempt to locate significant mineralization or proximal stratigraphy which may warrant drill testing. A total of 9.6 line kilometres of linecutting and geological mapping, and 355 soil samples along with one moss mat stream sample and one rock chip sample were completed as part of the 1997 program. Geology and soil geochemical results are plotted on 1:2500 scale grid maps included as figures 5 to 14.

LINECUTTING

Linecutting was carried out by Twin Mountain Enterprises Ltd. of Whitehorse, YT. Linecutting in 1997 consists of a total of 9.6 line kilometres comprising 4.9 line kilometres on the Elf Grid and 4.7 line kilometres on the southern portion of the Joel Creek Grid. On the Elf grid three lines (L104N to L106N) were completed which were not run in 1995, and the grid was extended 500 metres to the northwest (6 lines). At Joel Creek a large grid was established, the portion of which that lies on the Elf South Group



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KAMLOOPS, BRITISH COLUMBIA

ELF PROPERTY

CLAIM SOUTH GROUP and GRID LOCATION

FIGURE 3

of claims and is reported on here, comprises 1100 metres of baseline at an azimuth of 300°, 7 complete lines (L134N to L140N) and three partial lines (L141N to 143N). The boundary of the Elf South Group claims is plotted on figures 5-14. Lines were established at an azimuth of 030° and spaced 100 metres apart. All lines were cut using a power saw. Azimuths were turned off using a brunton compass and maintained utilizing sight pickets. Distances were chained and slope corrected. Stations were established every 25 metres on cross lines and the baseline and are marked by wooden pickets with metal tags. The linecutting was done from July 16 to July 25, 1997 (10 days). Grid locations are shown on figure 3 and accurate grid lines are plotted on figures 5 to 14.

GEOLOGY

A. Regional Geology (Figure 4)

The best description of the geology of the Gataga district - Akie River area, including the Elf property area is provided by MacIntyre (1981, 1992).

The Elf property is located within the Rocky Mountain Fold and Thrust belt of northeastern B.C. The property is located within Paleozoic, miogeoclinal basinal facies rocks of ancestral North America affinity (MacIntyre, 1992). These rocks were deposited in the Kechika Trough, a southeast extension of the Selwyn Basin, and are bounded to the east by platformal carbonates of the MacDONALD Platform and to the west by carbonates of the Cassiar Platform. The Kechika Trough is underlain by predominantly clastic rocks, ranging from Proterozoic to Triassic in age which form a northwest trending linear belt. The Elf property is underlain by black shale, siliceous shale and chert of the Gunsteel Formation, Lower Earn Group, of Upper Devonian age. The Stronsay (Cirque) deposit, located 30 kilometres to the northwest (38.5 mt @ 8.0% Zn, 2.2% Pb, 47.2g/t Ag), is hosted by the same Gunsteel Formation shales. Northeast directed compression has resulted in complex thrusting and related folding, resulting in difficult stratigraphic correlation.

Cyprus Anvil Mining Corporation carried out extensive work on the Elf property during the period 1978-1982, including regional and detailed mapping and diamond drilling. From this work a showing was discovered near Elf creek, consisting of laminated massive barite and galena, named the Elf Showing. This showing is associated with black, siliceous shale.

B. Property Geology - 1995 Work

Geological mapping in 1997 included, detailed grid controlled mapping on two grids, the Elf and Joel creek grids, comprising 4.9 line kilometres and 4.7 line kilometres, respectively. Mapping was facilitated by traversing grid lines and areas between lines and outcrops or other features were plotted in relation to the nearest grid station. Geological mapping was carried out between July 14 and 28, 1997. A single rock sample

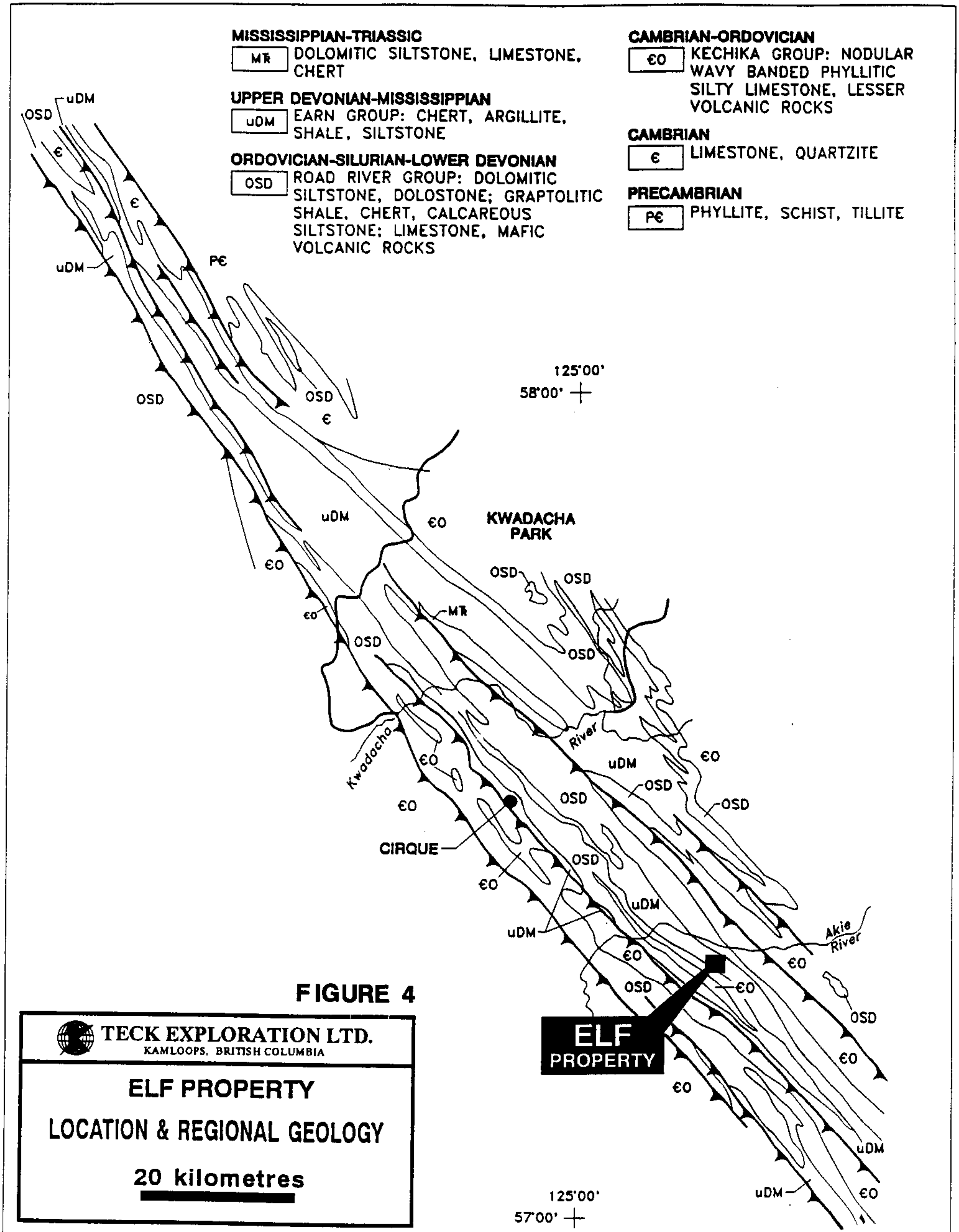

FIGURE 4

TECK EXPLORATION LTD.
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ELF PROPERTY

LOCATION & REGIONAL GEOLOGY

20 kilometres

AFTER MacINTYRE, 1983

and a moss mat stream sample were collected during the course of mapping. Geology for the Elf grid is plotted on figure 5 and for Joel Creek Grid, on figure 6.

The Gunsteel sequence on the property trends in a northwest - southeast manner across the claims and is bounded to the southwest by Silurian calcareous siltstone, which has been thrust northeastwards onto the younger Gunsteel shales. To the northeast the Gunsteel shales are overlain by a siltstone/shale package termed by previous operators as the Conundrum Siltstone. The nature of the contact is not clear, but likely is a fault.

Gunsteel shales form a belt several hundred metres thick on the property, however structural repetition is likely. Mapping in 1997 has recognized five distinctive subdivisions based on lithology, but relative stratigraphic relationships are unknown. The subdivisions include; silty, fissile shales (unit 3e), siltite laminated shale (unit 3d), chert (unit 3c), black "speckled" shale (unit 3b) and siliceous, graphitic shale (unit 3a). Siliceous graphitic shale of unit 3a is the host to mineralization. A description of lithological units is included in the "Lithology" section below. These different lithologies are distinctive in the field, however contacts are gradational resulting in areas with characteristics of more than one lithology, and several outcrops are often necessary to distinguish lithological units.

The shales have a general northwest strike with shallow to moderate dips to the southwest. Cleavage is generally subparallel to bedding but usually has a steeper, subvertical dip. Locally variable strikes and dips indicate complex structure, in terms of both folding and faulting. Small scale (10's of metres), tight to isoclinal, often overturned folds are common. Cliffs near the Joel Creek Showing show a variety of low to high angle faulting with offsets varying from a few centimetres to tens of metres and more. These faults are difficult to recognize anywhere other than cliff faces.

Chert is present, often as interbeds within siliceous shale, but locally forms a discrete lithological unit. Cherts are black and massive to thin bedded, are usually rusty weathering on fracture surfaces due to the presence of minor disseminated pyrite. Cherts tend to form thin, discontinuous horizons adjacent to siliceous shales but are also located in areas of generally undivided, non-siliceous shale

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On the Elf grid (figure 5), mapping was carried out on the newly established lines, L104-106N, and L112N-L117N. Bedrock exposure was found to be very poor. On lines 104N-106N moderate exposure is present and a relatively narrow (approx. 250 meters wide) Gunsteel shale sequence is present with Silurian dolomitic siltstone exposed to the southwest and siltstones of unit 4 to the northeast. the contact with siltstones of unit 4 is considered to be a fault, or possibly an unconformity in this area due to a reversal in bedding dip direction across the contact. Within the Gunsteel sequence two belts of siliceous shale (unit 3a) are present separated by 200 metres of non-siliceous shale. It is not clear whether two separate horizons are present or if a single horizon has been repeated by folding. The northeastern belt trends into the faulted contact with Unit 4 near L104N, and appears to terminate against the fault. A siliceous outcrop on L104N within the southwestern belt contains minor pyrite and nodular barite. This exposure was sampled (#51252) and sample location and results are shown on figure 5. The northeastern belt has a much shallower dip (~ 30° W) than the southwestern (~ 50° W), and this becomes more pronounced northwards. This could suggest structural repetition, as folding in the Gunsteel often displays a short steep limb-long flat limb symmetry. In the northwest area (L112N-L117N), sparse outcrop is present as far as about L114N, and no bedrock was identified beyond that. The northeast belt of siliceous shale was traced as far as L114N, where a graphitic, concretion bearing exposure with nodular barite and disseminated pyrite is present in a creek bed. Neither the southwest belt of siliceous shale nor the mineralization it is host to near L109N is exposed in the area mapped in 1997. Its potential strike extension to the northwest remains unknown. Past drilling does not extend beyond L114N.

On the Joel Creek Grid (figure 6), located approximately 2 kilometres northwest of the Elf Grid, 4.7 line kilometres of mapping were carried out over the southern portion of the grid. The Elf 8-Elf 13 claim boundary shown on figure 6, marks the northwestern boundary of the Elf South Group of claims, and only work carried out southeast of this boundary is discussed here. Results for the entire grid are shown on figure 6 for completeness however, the northwestern portion of the grid is the subject of a separate report. Mapping on the southeastern portion of the grid has identified a very narrow belt of Gunsteel shales (200 metres) bounded by Silurian siltstone to the southwest and siltstones of unit 4 to the northeast. Between L140N and L141N the Gunsteel sequence abruptly thickens to the northeast (to a 500 metre wide belt). Although the contact is not exposed, a northerly trending fault with right lateral sense of movement, is suspected, to account for this abrupt change. Exposure is very poor south of Joel Creek, and little can be discerned about the geology in this portion of the grid. A moss mat stream sample (# M51253) was collected from a small creek draining the Gunsteel sequence south of Joel Creek but results are inconclusive. Sample location and results are plotted on figure 6. North of Joel Creek exposure is much better. An exposure of siliceous shale containing laminated pyrite and nodular barite is present in Joel Creek and is described in detail as the Joel Creek Showing in a 1995 assessment report (Farmer, 1995). Mapping in 1997 shows this exposure to be part of a narrow northwest trending siliceous shale horizon (unit 3a) which continues onto the northern portion of the grid. Narrow bands of unit 3a are also present near the northeast end of line 143N, also trending onto the northern grid area. Significant mineralization was not identified on this portion of the grid, however the Gunsteel shale package is thickening northwestwards and at least two bands of favourable siliceous shales of unit 3a have been identified.

C. Lithology

The following section describes lithologic units used on geological maps included in this report. Units are numbered from stratigraphically lowest to highest, although stratigraphic relationships within the Gunsteel Formation are not known at this time. Contacts between units belonging to the Gunsteel Formation (3a-3e) are gradational.

UNIT 1 - ORDOVICIAN STRATIGRAPHY

This unit includes limestone (Unit 1a) and mafic volcanic rocks of the Ospika Volcanics (Unit 1b). Unit 1a consists of massive to thick bedded grey limestone forming prominent ridges and cliffs in the southeastern portion of the property. The age of the limestone is uncertain, but because it occurs in the same thrust panel as Ospika Volcanics is considered to be Ordovician. Unit 1b consists of limonitic to ankeritic weathering, carbonate-rich, mafic volcanic flows and breccias. Rocks of Unit 1 are exposed in a thrust panel in the southeastern corner of the Elf claims, and are not exposed in the northern portion of the property, which is the subject of this report, and will not be discussed further here.

UNIT 2 - SILURIAN SILTSTONE

This is a distinctive package of rocks, including several lithologies which have not been subdivided. The most common and distinctive lithology consists of brown to buff weathering dolomitic siltstone. The siltstone varies from thin to thick bedded and locally contains thin interbeds of grey calcareous, shale. Occasionally, dark grey massive limestone is present as beds varying from a few centimetres to several ten's of metres thick. A lithology consisting of light grey calcareous mudstone containing 70% grey "pancake shaped" discontinuous limestone beds to 10 centimetres thick is also present locally. Rocks of Unit 2 have been thrust in a northeast direction over Devonian Gunsteel stratigraphy.

UNIT 3 - GUNSTEEL SHALES

Gunsteel shales are Upper Devonian in age and consist of grey to black shale, mudstone and chert. The sequence is host to Sedex Pb-Zn-Ag-Ba mineralization throughout the Kechika Trough and Selwyn Basin. Geological mapping on the Elf property has recognized five subdivisions within the Gunsteel shales, here designated as units 3a to 3e.

Subunit 3a consists of siliceous, graphitic black shale which locally contains carbonate concretions, nodular barite and/or laminated pyrite. This subunit is the direct host to mineralization on the property. Due to the very siliceous to cherty nature of these rocks they tend to be non-fissile, in spite of being intensely graphitic and strongly cleaved. In addition, when present, concretions, barite nodules and pyrite laminations make this subunit readily identifiable. Carbonate concretions vary from less than one centimetre to in excess of one metre in diameter.

Subunit 3b consists of a very distinctive massive, black, silty shale containing abundant, pinhead sized grey spots, lending a speckled appearance to the lithology on fresh surface. Composition of the spots is not known. Speckled shale of subunit 3b locally seems to form a readily mappable lithological unit, but in other areas occurs only as interbeds in other units. On the Joel Creek grid, speckled or spotted texture has been identified in siltstone and shale of unit 4 locally, perhaps suggesting that the texture may be a later (alteration or metamorphic?) event.

Chert (subunit 3c) is present, locally, throughout the Elf property. It occurs as interbeds a few tens of centimeters thick within siliceous shale of subunit 3a and as a distinct lithology 10 to 20 metres thick within and adjacent to subunit 3a. Cherts are also present far removed from siliceous shale stratigraphy where they form discrete horizons within siltite laminated shales of subunit 3d or silty shales of subunit 3e. As such they do not appear to be restricted to a particular portion of stratigraphy, but rather occur throughout the Gunsteel stratigraphy. Cherts are black and vary from massive to thinly bedded. They are characteristically rusty weathered on fracture surfaces due to a minor content of disseminated pyrite. Chert horizons can seldom be traced for any distance along strike, suggesting a discontinuous nature to their presence.

Subunit 3d consists of a grey to black, siltite laminated shale. Siltite laminations are light grey in colour and a few millimetres to one centimetre thick, often imparting a striped appearance to shales, particularly on weathered surfaces. Rocks of subunit 3d are always non-siliceous, and often silty looking. They are commonly very fissile in outcrop and are generally associated with undivided shale of subunit 3e. Siltite laminated shales are always distal from mineralization and combined with silty fissile shale of subunit 3e probably form the bulk of Gunsteel stratigraphy.

Unit 3e includes silty, fissile grey to black shales to mudstones. These shales are non-siliceous and non-graphitic. They often have a "silty" appearance and may locally grade into siltstone or mudstone. A ubiquitous slaty cleavage is particularly well developed in unit 3e, producing commonly fissile shale, locally to the point of paper thin plates. Unit 3e includes all undivided Gunsteel shales.

UNIT 4 - CONUNDRUM SILTSTONE

Unit 4 overlies the Gunsteel shales but is likely still of Upper Devonian age. This unit probably correlates with the Conundrum Siltstone as described by Cyprus Anvil geologists (Roberts, 1979; Jefferson, 1980), and consists of a siltstone dominant sequence. Main rock types include; grey, brown, to black weathering, grey to black, thick bedded (2-50cm) siltstone. Locally, grey shale interbeds produce a well bedded siltstone- shale lithology. Occasional coarser, gritty beds may be present. The siltstone and shale are often, but not always, mildly calcareous. Contact relationships between units 3 and 4 are not known however, bedding reversals across the contact suggest a fault or unconformity. There is some suggestion of a broad transition between upper Gunsteel Fm. and Conundrum siltstone. This transition is in the form of increasing siltstone content towards the top of the Gunsteel Fm., becoming siltstone dominant in Unit 4. Additional work is necessary to confirm this however, if correct, may be indicative of a marine regression in the uppermost Devonian, allowing a rapid influx of coarser clastic material.

D. Mineralization

One significant showing was previously known on the Elf property, the Elf Showing discovered by Cyprus Anvil Mining Corp. in 1979. A second, baritic occurrence was discovered in Joel Creek in 1995 (Farmer, 1995). The following showing descriptions are from Farmer, 1995.

The Elf Showing, located on the Elf Grid and mapped in detail in 1995 consists of massive, well laminated barite at least four metres thick, originally exposed in three trenches and several pits. The barite is host to considerable galena as disseminations and thin (<2 cm, max 10 cm) massive laminations, as well as minor pyrite and trace sphalerite. Additional hand trenching in 1995 extended the known surface strike length of the showing to 50 metres. Mineralization is overlain and underlain by siliceous black shale. Concretion bearing shale is present in the structural hanging wall and a greenish, sericitic shale is locally present in the structural footwall. Barite nodules are also present for at least 10 metres above and below mineralization. Locally, the immediate footwall to mineralization, particularly at the northwest end, is a coarse, crystalline calcite vein, up to several metres thick, often containing patchy recrystallized galena and sphalerite. The veining may be indicative of a fault on the footwall side of mineralization. Bedding / cleavage relationships suggest the mineralization is on the west limb of an overturned antiform. To the west, within 50 metres, Silurian siltstone has been thrust over the Gunsteel package containing the mineralization. On surface, mineralization grades up to 0.22% Zn, 10.46% Pb, 22.58 g/t Ag over 4.0 metres.

The Joel Creek Showing (Figure 6) was discovered in 1995. Mineralization is exposed in a cliff on the northwest side of Joel Creek, and consists of beds of nodular to blebby barite (5-20%) and laminated pyrite (10-30%) within black, graphitic, siliceous to cherty shale. The mineralized zone is approximately 4 metres thick. Individual barite-pyrite beds are 10-20 cm thick. The mineralized zone forms a gossan, enhanced by two Fe-seeps which seem to drain a high angle fault two metres into the hanging wall. The mineralized zone is also characterized by abundant hydrozincite and hemimorphite surface coatings. Bedding strikes 110° to 120° and dips 60° to the southwest. The hanging wall to mineralization consists of a thick succession of black siliceous to cherty shale containing occasional concretions to 10 cm, as well as local mm-scale pyrite laminations and barite nodules. The footwall to mineralization is a grey to black, silty, well laminated shale also containing local mm-scale pyrite laminations and barite nodules. The sequence is cut by a series of high angle faults, subparallel to either bedding or cleavage which have a west side down or, left lateral (strike slip) sense of movement.

Mapping in 1997 did not discover any new occurrences, however at Joel Creek the host sequence was traced 300 metres to the northwest where it passes onto the northern portion of the grid, described in a separate report.

GEOCHEMISTRY

A total of 355 soil samples, one rock chip and one moss mat stream sample were collected as part of the 1997 exploration program, comprising 156 soil samples and one rock sample from the Elf Grid and 199 soil samples and one moss mat stream sample form the southern portion of the Joel Creek grid. Soil samples were collected at 25 metre intervals along grid lines and at 50 metre intervals along the baseline. An attempt was made to sample the "B" soil horizon whenever possible. Soil development was generally good on the Joel Creek Grid and highly variable on the Elf Grid. Thick till with extensive calcrete development prevented the collection of quality samples in some locations on the Elf Grid. A hand type soil auger was utilized for soil collection and proved effective for penetrating talus and reaching deep "B" horizons in some areas. Sampling was carried out between July 14 and 28, 1997.

All samples were placed in Kraft paper bags and sent to Cominco laboratories in Vancouver, B.C. for analysis where all were analyzed for Pb, Zn, Ag, and total Ba. Sample locations and results for Pb, Zn, Ag, Ba are shown on figures 7-10 for the Elf Grid and figures 11-14 for the Joel Creek Grid. Complete results are listed on the Certificates of Analyses located in Appendix III. Analytical procedures are included in Appendix IV, and Soil Sample Descriptions in Appendix V.

The following section provides an interpretation and description of the geochemical results. Figures 7-14 show plotted values for the elements Pb, Zn, Ag and Ba respectively and anomalous values have been contoured. Grid station numbers are the sample numbers and as such, a separate sample location map is not included. The anomalous threshold was determined by visual examination of the plotted data. A background was estimated and the anomalous threshold was selected at two times the estimated background. Experience in the belt has shown that discrimination of anomalies by visual examination of data is an effective method of determining anomalous thresholds for soil geochemical data. Threshold values for the Elf Grid are; Pb - 100ppm, Zn - 1000ppm, Ag - 1.0ppm and Ba - 10,000ppm and for the Joel Creek Grid; Pb - 100ppm, Zn - 1000ppm, Ag - 1.0ppm and Ba 8000ppm.

A. Elf Grid (Figures 7-10)

Soil results for the Elf Grid (figures 7-10) show a continuation of the main anomaly associated with the Elf Showing (Farmer, 1995) to the southeast for Pb and Ag. The anomalies are decreasing in size and contrast and tend to be displaced slightly from exposures of the western siliceous shale band. Pb is displaced slightly uphill to the west and Ag, though coincident, tends to crosscut stratigraphy slightly, though this may be due in part to a contouring bias. Zn and Ba are not anomalous in this area. The eastern siliceous shale band is marked by a weak Ag-Zn-Ba anomaly. Maximum values in this area are; Pb - 457ppm, Ag - 4.5ppm, Zn - 2510ppm and Ba - 16,276ppm. Mineralization has been traced by drilling as far southeast as 106+50N, and the recent soil data suggests it may extend for another 200 metres, however it may be weakening.

Northwest of the Elf Showing, on lines 111N to 117N a weak Pb anomaly (200ppm) extends as far northwest as L112N along the eastern shale band, and there is a weak Ag response coincident with it. Pb, Ag, and Ba are otherwise not anomalous in this grid extension area. Zn shows a strong, large anomaly extending from the Elf showing northwestwards across the entire grid area. Maximum values reach 5758ppm Zn, comparable to values immediately below the showing. This anomaly follows the projected trace of the thrust contact with Silurian dolomitic siltstone, along which are numerous groundwater iron seeps. Cause of the zinc anomaly is not known however, the lack of other elements, particularly Pb, suggests the anomaly may be related to the iron seeps. On the other hand, this is also the area where any strike extension of the mineralization would be expected to subcrop. Poor soil development and extensive calcrete deposits in this area may also play a role in the poor soil results.

B. Joel Creek Grid (Figures 11-14)

On the Joel Creek Grid, soil quality is generally very good, with good BF horizons developed over much of the area. The BF horizon is often found at moderate depths however, often >30cm. Where a good BF was not present samples were collected from a light to medium brown B horizon or a grey to brown C horizon with abundant locally derived fragments.

Pb geochemistry (figure 11), is dominated by a large, high contrast anomaly along the northeastern end of lines 140N to 143N. This anomaly continues to the northwest off of the Elf South Group claims, and is coincident with a weak Ag response and weak, discontinuous Ba. This anomaly coincides with a mapped lense of siliceous shale of unit 3a in the northwest portion on line 143N and passes southeastward through silty shales of unit 3e approximately parallel to strike, then crosses the interpreted contact into siltstone of unit 4 on line 140N. Maximum values are 1170ppm Pb, 3.6ppm Ag and 10,343ppm Ba.

A weak Pb anomaly on lines 137N and 138N near 99E is coincident with weak Ag, as is a response at 98+25E on line 134N. Ag here is stronger (to 4.7ppm) and continues northwest to line 136N. Both of these anomalies are within Gunsteel stratigraphy in an area of very poor exposure.

A weak Pb response near the northeast end of lines 137N and 138N is coincident with weak Ag and is underlain by siltstone of unit 4, near the interpreted contact with Gunsteel shales.

A moderately strong Zn anomaly (to 3000ppm) is present near 99E on lines 140N to 143N and continues northwest off the Elf South Group claims. There is no other element association, considerable outcrop in the area is not mineralized, and the anomaly follows a small creek ravine, indicating that the anomaly is likely transported.

A Ba anomaly (figure 14) near 98E on lines 138N and 139N is located just northeast of the Joel Creek baritic showing and follows the northeastern contact of a siliceous shale horizon. A peak value of 16,506ppm which occurs on line 139N, north of the showing, may indicate additional barite in this area. A larger anomaly between 96E and 97E on lines 135N and 136N parallels the thrust contact with Silurian stratigraphy to the west and likely is related to leakage from the fault

CONCLUSIONS

A program including linecutting, geological mapping and soil geochemical sampling was undertaken on the Elf South Group claims in 1997. The program comprised 9.6 line kilometres of linecutting, and geological mapping and 355 soil samples, carried out on two grids, the Elf Grid and the southern portion of the Joel Creek Grid. Work was carried out between July 14 and 28, 1997.

Mapping on the Elf Grid has reinterpreted the sequence to include two parallel belts of siliceous shale of unit 3a, possibly representing repetition by folding. Mineralization and the siliceous shales hosting mineralization could not be traced any distance to the northwest due to extensive, thick overburden.

On the Joel Creek grid, a thin belt of Gunsteel shales bounded by Silurian dolomitic siltstone to the west and siltstones of unit 4 to the east thickens rapidly near the northern boundary of the Elf South Group claims, likely as a result of faulting. Exposure within the Gunsteel sequence is extremely poor south of Joel Creek. North of the creek, the Joel Creek Showing was found to be part of siliceous shale horizon trending northwest and extending off of the area mapped as part of the program which is the subject of this report. A second band of siliceous shale was also identified 250 metres to the northeast and, once again, trends off the area of current mapping. This area is associated with strong Pb-Ag +/- Ba soil anomaly and warrants further investigation.

Soil geochemistry on the Elf grid identified weak multielement anomalies roughly coincident with mapped siliceous shale stratigraphy south of Elf Creek on lines 104N to 106N. One of these anomalies may indicate that mineralization traced by previous drilling as far southeast as line 106N could extend an additional 200 metres to the southeast.

On the Joel Creek grid, soil geochemistry has identified a strong Pb-Ag +/- Ba associated with siliceous shales in the northeastern corner of the area surveyed, which extends off the surveyed area to the northwest. Additional work is required to explain the source of this anomaly. A small Ba anomaly is present near the Joel Creek Showing, however a lack of associated elements indicates that base metal mineralization is likely not present.

The grid should be extended to the southeast to trace small Pb-Ag anomalies located at that end of the grid. This would also allow mapping of the Gunsteel sequence in a well exposed area southeast of the present grid.

REFERENCES

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APPENDIX I:

COST STATEMENT

COST STATEMENT

1. Linecutting (Twin Mountain Enterprises)

4 men for 6 days (July 17-22) @ $260.00/man/day $6,240.00
6 men for 2 days (July 16, 23) @ $260.00/man/day....................................$3,120.00
4 men for 1 day (July 24) @ $260.00/man/day $1,040.00
2 men for 1 day (July 25) @ $260.00/man/day $520.00

Subtotal:...$10,920.00

2. Mobilization/Demobilization (Proportionate Share)

1/3 of Personnel Time $1,300.00
1/3 of Transportation Cost (1 flight between Mackenzie and Finbow).....$1,100.00

Subtotal...$2,400.00

3. Geology and Geochemistry (July 20-28, 1997)

a) Geologist (R. Farmer) (July 20-26), 7 days @ $300.00/day..........$2,100.00
b) Geologist (S. Smith) (July 24-27), 4 days @ $250.00/day............$1,000.00
c) Soil Sampler (Twin Mtn)(July 20-28), 9 days @ $260.00/day $2,340.00

Subtotal:...$5,440.00

4. Analytical (Cominco Laboratories)

a) 355 soil samples (Pb, Zn, Ag, Ba) @ $8.00 ea. $2,840.00
b) 1 moss mat stream sample (Pb, Zn, Ag, Ba) @ $8.00ea. $8.00
c) 1 rock sample (Pb, Zn, Ag, Ba) @ $8.00ea $8.00

Subtotal:...$2,856.00

5. **Helicopter** (Northern Mtn. Helicopters)

a) A-Star, 15.25 hrs @ $875.00/hr $13,343.75
b) Jetranger, 0.7 hrs @ $625.00/hr $437.50
c) Fuel, 2981.80 liters @ $1.15/liter $3,429.07

Subtotal: $17,210.32

6. **Accomodation and Food** (Finbow Camp)

July 14-28, 1997
62 mandays at $96.30/manday $5,970.60

Subtotal: $5,970.60

7. **Report and Drafting**

a) Report Writing and Interpretation
R. Farmer, 5 days @ $300.00/day $1,500.00

b) Drafting, 3 days @ $100.00/day $300.00

Subtotal: $1,800.00

Total Cost of Program $46,596.92

PROFESSIONAL
PROVINCE OF BRITISH COLUMBIA
R. D. FARMER
GEOSCIENTIST

APPENDIX II:

STATEMENT OF QUALIFICATIONS

I, Randy Farmer, do hereby certify that:

1) I am a geologist and have practised my profession for more than 17 years.

2) I graduated from Lakehead University in Thunder Bay, Ontario with an Honours Bachelor of Science degree, (Geology), in 1980.

3) I conducted the exploration program on the Elf Property, interpreted the results, and authored the report contained herein.

4) All data contained within this report and conclusions drawn from it are true and accurate to the best of my knowledge.

5) I hold no personal interest, direct or indirect, in the Elf Property or its results, which is the subject of this report.

6) I am a Professional Geoscientist registered in the Province of British Columbia (Registration No. 20192).

PROFESSIONAL PROVINCE OF R. D. FARMER BRITISH COLUMBIA GEOSCIENTIST

Randy Farmer, P. Geo.
District Manager, Kamloops
October, 1997

APPENDIX III:

CERTIFICATES OF ANALYSES

ELF GRID

TECK/ELF-X97

Job V 97-0623S

PROJECT #1754

Report date 28 JUL 1997

LAB NO.	FIELD NUMBER	East+ West-	North+ South-	Pb ppm	Zn ppm	Ag ppm	Ba ppm
S9713872		+9500	E106	67	362	1.8	2453
S9713873		+9525	E106	48	305	2.3	2106
S9713874		+9550	E106	59	448	1.3	3165
S9713875		+9575	E106	53	709	.7	4976
S9713876		+9600	E106	50	366	1.3	5216
S9713877		+9625	E106	39	237	.9	6159
S9713878		+9650	E106	457	749	1.8	7014
S9713879		+9675	E106	172	450	1.9	7040
S9713880		+9700	E106	153	449	2.5	6799
S9713881		+9725	E106	55	803	1.7	E13843
S9713882		+9750	E106	39	179	1.9	2681
S9713883		+9775	E106	24	97	1.5	3416
S9713884		+9800	E106	29	112	.5	3218
S9713885		+9825	E106	49	237	1	3452
S9713886		+9850	E106	43	1250	1.4	4497
S9713887		+9875	E106	58	183	2.2	3014
S9713888		+9900	E106	40	297	.6	4383
S9713889		+9925	E106	36	392	2.4	5368
S9713890		+9950	E106	19	163	.4	3565
9713891		+9975	E106	20	432	<.4	2619
713892		+9500	E105	28	139	.6	3435
S9713893		+9525	E105	57	262	.6	3792
S9713894		+9550	E105	43	147	.4	2763
S9713895		+9575	E105	33	256	.4	4042
S9713896		+9600	E105	32	275	.7	4161
S9713897		+9625	E105	31	207	.9	4628
S9713898		+9650	E105	27	155	<.4	3508
S9713899		+9675	E105	138	418	1.1	6332
S9713900		+9700	E105	206	106	4.5	7515
S9713901		+9725	E105	91	282	.9	8403
S9713902		+9750	E105	25	151	<.4	2158
S9713903		+9775	E105	27	180	.6	2530
S9713904		+9800	E105	30	109	1.4	3392
S9713905		+9825	E105	38	155	.9	3347
S9713906		+9850	E105	21	120	<.4	3173
S9713907		+9875	E105	19	158	.4	2809
S9713908		+9900	E105	40	122	.7	3988
S9713909		+9925	E105	39	200	2.5	E11496
S9713910		+9950	E105	32	273	1.2	5907
S9713911		+9975	E105	54	160	.8	6924
S9713912		+9500	E104	23	111	.5	3575
S9713913		+9525	E104	43	168	.4	2700
S9713914		+9550	E104	41	94	<.4	1531
S9713915		+9575	E104	50	128	<.4	2001
S9713916		+9600	E104	63	340	.5	2937
S9713917		+9625	E104	42	368	1	3885
S9713918		+9650	E104	29	188	1.5	5153
S9713919		+9675	E104	391	678	1.3	7661
713920		+9700	E104	244	226	2.9	9418
S9713921		+9725	E104	148	350	2.7	6752
S9713922		+9750	E104	210	198	.7	6262

LAB NO.	FIELD NUMBER	East+ West-	North+ South-	Pb ppm	Zn ppm	Ag ppm	Ba ppm
S9713923		+9775	E104	45	191	.6	2925
S9713924		+9800	E104	34	106	.7	3250
S9713925		+9825	E104	29	191	1.3	2492
S9713926		+9850	E104	44	137	2.4	2273
S9713927		+9875	E104	5	59	1.2	886
S9713928		+9900	E104	40	98	.9	3022
S9713929		+9925	E104	84	174	<.4	3162
S9713930		+9950	E104	31	2510	1.2	E16276
S9713931		+9975	E104	22	124	.4	2166

I=insufficient sample X=small sample E=exceeds calibration C=being checked R=revised
If requested analyses are not shown ,results are to follow

ANALYTICAL METHODS

Pb Reverse Aqua Regia / AAS
Zn Reverse Aqua Regia / AAS
Ag Reverse Aqua Regia / AAS
Ba X-Ray fluorescence / loose powder

TECK/ELF-X97

Job V 97-0651S

PROJECT #1754 Report date 11 AUG 1997

LAB NO.	FIELD NUMBER	East+ West-	North+ South-	Pb ppm	Zn ppm	Ag ppm	Ba ppm
S9716362		+9500	E115	34	333	<.4	3862
S9716363		+9525	E115	55	598	.4	3893
S9716364		+9550	E115	39	534	.5	3602
S9716365		+9575	E115	44	1280	.5	3583
S9716366		+9600	E115	37	1400	.7	3644
S9716367		+9625	E115	51	3250	1	3550
S9716368		+9650	E115	38	1070	.4	4392
S9716369		+9675	E115	37	797	.5	3336
S9716370		+9700	E115	49	972	.7	4266
S9716371		+9725	E115	40	1120	.6	3847
S9716372		+9750	E115	31	1130	.4	2079
S9716373		+9775	E115	29	936	.7	3111
S9716374		+9800	E115	32	745	.8	3219
S9716375		+9825	E115	20	407	<.4	2643
S9716376		+9850	E115	25	540	.4	2988
S9716377		+9875	E115	27	367	<.4	3205
S9716378		+9900	E115	26	499	.7	4013
S9716379		+9925	E115	26	402	.5	3605
S9716380		+9950	E115	30	377	.4	3560
S9716381		+9975	E115	23	423	.7	4034
S9716382		+10000	E115	28	418	<.4	3985
S9716383		+10000	E11550	28	487	<.4	4112
S9716384		+9500	E113	30	521	<.4	5243
S9716385		+9525	E113	21	340	<.4	4445
S9716386		+9550	E113	29	689	.6	4695
S9716387		+9575	E113	30	805	.6	4324
S9716388		+9675	E113	20	5750	<.4	1137
S9716389		+9700	E113	25	1170	.5	3161
S9716390		+9725	E113	25	1260	.6	3185
S9716391		+9750	E113	24	1110	.5	2816
S9716392		+9775	E113	21	976	.5	2792
S9716393		+9800	E113	25	430	.7	2870
S9716394		+9825	E113	70	629	.8	3872
S9716395		+9850	E113	36	419	.6	3197
S9716396		+9875	E113	49	746	.8	4912
S9716397		+9900	E113	73	457	.6	3459
S9716398		+9925	E113	21	328	<.4	2620
S9716399		+9950	E113	46	327	<.4	2635
S9716400		+9975	E113	40	302	.7	3013
S9716401		+10000	E113	33	292	<.4	3443
S9716402		+10000	E11350	30	539	.5	2964
S9716403		+9500	E114	51	2420	.6	3897
S9716404		+9525	E114	30	583	.5	3794
S9716405		+9550	E114	80	916	.8	4043
S9716406		+9575	E114	36	690	.6	3251
S9716407		+9600	E114	36	845	.7	4046
S9716408		+9600	E114	45	1380	.7	2993
S9716409		+9625	E114	51	2080	.4	2886
S9716410		+9625	E114	32	436	.4	3950
S9716411		+9650	E114	21	2460	.8	3945
S9716412		+9650	E114	26	960	.6	2547

LAB NO.	FIELD NUMBER	East+ West-	North+ South-	Pb ppm	Zn ppm	Ag ppm	Ba ppm
S9716413		+9675	E114	26	793	.5	3382
S9716414		+9700	E114	24	546	.5	4492
S9716415		+9725	E114	39	309	.4	2515
S9716416		+9750	E114	29	1700	.7	3242
S9716417		+9775	E114	37	571	.5	3313
S9716418		+9800	E114	24	671	.7	3843
S9716419		+9825	E114	25	396	<.4	4101
S9716420		+9850	E114	25	277	.8	3819
S9716421		+9875	E114	31	336	<.4	3101
S9716422		+9900	E114	29	413	.4	3192
S9716423		+9925	E114	32	437	1	3607
S9716424		+9950	E114	32	626	.6	3306
S9716425		+9975	E114	38	625	.8	3027
S9716426		+10000	E114	36	603	.6	3228
S9716427		+9600	E111	38	1050	.4	3109
S9716428		+9625	E111	28	1180	.5	3228
S9716429		+9650	E111	37	1050	.5	3878
S9716430		+9675	E111	18	1420	.4	2171
S9716431		+9700	E111	48	538	.5	2348
S9716432		+9725	E111	22	1070	.6	2840
S9716433		+9750	E111	93	41	1.1	3056
S9716434		+9775	E111	29	52	.5	2059
S9716435		+9800	E111	99	170	.5	3426
S9716436		+9825	E111	81	241	.5	5244
S9716437		+9850	E111	52	152	.7	4385
S9716438		+9875	E111	240	403	2.2	4388
S9716439		+9900	E111	168	387	.5	3871
S9716440		+9925	E111	96	459	1.2	4894
S9716441		+9950	E111	39	344	<.4	2785
S9716442		+9975	E111	42	435	<.4	2899
S9716443		+9600	E112	42	787	.8	3576
S9716444		+9625	E112	28	1410	.7	3438
S9716445		+9650	E112	17	1520	.6	1442
S9716446		+9675	E112	34	916	.8	2937
S9716447		+9700	E112	24	724	.7	2146
S9716448		+9725	E112	22	857	.6	2275
S9716449		+9750	E112	36	850	.8	2611
S9716450		+9775	E112	30	857	.7	2833
S9716451		+9800	E112	29	966	.6	2419
S9716452		+9825	E112	32	922	.4	2717
S9716453		+9850	E112	48	735	.8	3686
S9716454		+9875	E112	284	970	.9	3303
S9716455		+9900	E112	200	1080	.8	3464
S9716456		+9925	E112	24	810	.9	3804
S9716457		+9950	E112	34	796	.7	3532
S9716458		+9975	E112	31	584	.6	3031
S9716459		+9500	E117	9	129	<.4	3468
S9716460		+9525	E117	29	250	.7	3739
S9716461		+9550	E117	27	646	.7	3891
S9716462		+9575	E117	34	856	.6	4414
S9716463		+9600	E117	24	794	.9	3923
S9716464		+9625	E117	19	749	1	4211
S9716465		+9650	E117	38	2575	.6	4192
S9716466		+9675	E117	36	921	.4	3948

LAB NO.	FIELD NUMBER	East+ West-	North+ South-	Pb ppm	Zn ppm	Ag ppm	Ba ppm
S9716467		+9700	E117	37	880	.6	3922
S9716468		+9725	E117	43	730	.5	3716
S9716469		+9750	E117	28	324	.5	2976
S9716470		+9775	E117	42	915	.8	4151
S9716471		+9800	E117	33	781	.6	3818
S9716472		+9825	E117	20	640	.5	3502
S9716473		+9850	E117	33	556	.5	3453
S9716474		+9875	E117	27	578	<.4	3413
S9716475		+9900	E117	26	671	.5	3431
S9716476		+9925	E117	41	841	.6	3862
S9716477		+9950	E117	34	377	.9	3973
S9716478		+9975	E117	33	933	.4	3272
S9716479		+10000	E117	28	749	.6	2953
S9716480		+10000	E11650	34	493	.5	3058
S9716481		+9500	E116	49	1240	.6	3596
S9716482		+9525	E116	70	1030	.8	3381
S9716483		+9550	E116	35	1040	.6	3449
S9716484		+9575	E116	29	744	.6	3340
S9716485		+9600	E116	44	1230	.9	3350
S9716486		+9625	E116	42	1030	.8	3323
S9716487		+9650	E116	45	933	.5	3481
S9716488		+9675	E116	47	924	.7	3281
S9716489		+9700	E116	37	1170	.8	3992
S9716490		+9725	E116	37	766	.7	3219
S9716491		+9750	E116	39	795	.6	3361
S9716492		+9775	E116	39	808	.8	3656
S9716493		+9800	E116	28	624	.8	3997
S9716494		+9825	E116	41	876	.9	3755
S9716495		+9850	E116	22	588	.7	3674
S9716496		+9875	E116	28	605	1	3756
S9716497		+9900	E116	31	515	.4	4124
S9716498		+9925	E116	20	803	.6	2794
S9716499		+9950	E116	34	521	.5	3846
S9716500		+9975	E116	37	544	.4	3377
S9716501		+10000	E116	38	559	.6	3611

I=insufficient sample X=small sample E=exceeds calibration C=being checked R=revised
If requested analyses are not shown ,results are to follow

ANALYTICAL METHODS

Pb Reverse Aqua Regia / AAS
Zn Reverse Aqua Regia / AAS
Ag Reverse Aqua Regia / AAS
Ba X-Ray fluorescence / loose powder

LAB NO.	FIELD NUMBER	East+ West-	North+ South-	Pb ppm	Zn ppm	Ag ppm	Ba ppm
S9717825		+9900	J140	49	511	.6	5903
S9717826		+9925	J140	43	3040	<.4	4229
S9717827		+9950	J140	26	99	.5	2863
S9717828		+9975	J140	234	237	1.9	3386
S9717829		+10000	J140	332	290	1.8	3521
S9717830		+10025	J140	279	283	1.3	3237
S9717831		+10050	J140	364	284	1.6	3697
S9717832		+10075	J140	259	357	1.4	4432
S9717833		+10100	J140	22	234	<.4	1797

I=insufficient sample X=small sample E=exceeds calibration C=being checked R=revised
If requested analyses are not shown ,results are to follow

ANALYTICAL METHODS

Pb Reverse Aqua Regia / AAS
Zn Reverse Aqua Regia / AAS
Ag Reverse Aqua Regia / AAS
Ba X-Ray fluorescence / loose powder

JOEL CREEK GRID

TECK/ELF-X97

Job V 97-0684S

JOEL CR.

Report date 15 AUG 1997

LAB NO.	FIELD NUMBER	East+ West-	North+ South-	Pb ppm	Zn ppm	Ag ppm	Ba ppm
S9717479		+9600	J137	41	233	<.4	3139
S9717480		+9625	J137	59	139	.9	2732
S9717481		+9650	J137	48	341	<.4	3535
S9717482		+9675	J137	32	448	.5	3484
S9717483		+9700	J137	33	511	.6	3791
S9717484		+9725	J137	52	368	.8	7038
S9717485		+9750	J137	41	327	.5	3939
S9717486		+9775	J137	28	140	<.4	2490
S9717487		+9800	J137	38	536	.7	5405
S9717488		+9825	J137	20	363	<.4	3319
S9717489		+9850	J137	33	236	.4	3134
S9717490		+9875	J137	52	404	.7	3865
S9717491		+9900	J137	208	118	2.7	6683
S9717492		+9925	J137	62	39	.5	3654
S9717493		+9950	J137	96	92	.4	3513
S9717494		+9975	J137	301	116	.7	5166
S9717495		+10000	J137	200	285	3.9	3051
S9717496		+9600	J138	51	188	.5	2713
S9717497		+9625	J138	38	169	.5	2822
S9717498		+9650	J138	42	198	<.4	3303
S9717499		+9675	J138	37	185	.7	3219
S9717500		+9700	J138	71	503	.6	4413

LAB NO.	FIELD NUMBER	East+ West-	North+ South-	Pb ppm	Zn ppm	Ag ppm	Ba ppm
S9717501		+9725	J138	44	607	.9	5055
S9717502		+9750	J138	45	647	.7	5603
S9717503		+9775	J138	57	562	.9	5059
S9717504		+9800	J138	50	459	.9	8489
S9717505		+9825	J138	47	460	.6	7609
S9717506		+9850	J138	53	435	1.1	6609
S9717507		+9875	J138	58	372	.9	8026
S9717508		+9900	J138	27	243	.5	3527
S9717509		+9925	J138	175	396	.7	5493
S9717510		+9950	J138	134	229	.5	7383
S9717511		+9975	J138	32	161	<.4	3734
S9717512		+10000	J138	152	262	1.4	5776
S9717513		+9600	J139	30	226	.6	2284
S9717514		+9625	J139	31	201	.4	2108
S9717515		+9650	J139	43	223	<.4	2366
S9717516		+9675	J139	34	213	.5	2455
S9717517		+9700	J139	47	565	.5	4076
S9717518		+9725	J139	46	209	<.4	2571
S9717519		+9750	J139	52	273	.5	3818
S9717520		+9775	J139	51	249	<.4	5781
S9717521		+9800	J139	55	310	<.4	4849
S9717522		+9825	J139	66	374	.7	5072
S9717523		+9850	J139	57	493	<.4	E16506
S9717524		+9875	J139	115	356	.7	6897
S9717525		+9900	J139	48	268	.5	6687
S9717526		+9925	J139	84	627	.7	4141
S9717527		+9950	J139	31	623	<.4	2129
S9717528		+9975	J139	34	276	<.4	3082
S9717529		+10000	J139	48	5550	1	5715

LAB NO.	FIELD NUMBER	East+ West-	North+ South-	Pb ppm	Zn ppm	Ag ppm	Ba ppm
S9717587		+9600	+13450	23	290	<.4	4111
S9717588		+9600	+13550	38	68	.4	7806
S9717589		+9600	+13650	65	169	.4	E11908
S9717590		+9600	+13750	29	178	<.4	2546
S9717591		+9600	+13850	28	236	<.4	2124

LAB NO.	FIELD NUMBER	East+ West-	North+ South-	Pb ppm	Zn ppm	Ag ppm	Ba ppm
S9717761		+10150	J143	217	62	1.1	E10343
S9717762		+10175	J143	584	302	6	2348
S9717763		+10200	J143	333	189	4.2	3453

LAB NO.	FIELD NUMBER	East+ West-	North+ South-	Pb ppm	Zn ppm	Ag ppm	Ba ppm
S9717779		+9975	J142	19	501	<.4	4346
S9717780		+10000	J142	21	164	<.4	4718
S9717781		+10050	J142	50	317	<.4	5680
S9717782		+10075	J142	50	387	<.4	3696
S9717783		+10100	J142	380	326	1.3	3578
S9717784		+10125	J142	96	163	1.5	2297
S9717785		+10150	J142	76	285	.4	2491
S9717786		+10175	J142	63	308	<.4	3564
S9717787		+10200	J142	44	210	<.4	2094
9717796		+9800	J141	82	485	.4	3214
S9717797		+9825	J141	73	556	<.4	3307
S9717798		+9850	J141	93	532	<.4	2862
S9717799		+9875	J141	55	572	.4	3619
S9717800		+9900	J141	80	2030	<.4	4226
S9717801		+9925	J141	38	2330	.6	4906
S9717802		+9950	J141	27	588	.7	4643
S9717803		+9975	J141	25	178	<.4	3156
S9717804		+10000	J141	38	365	<.4	4995
S9717805		+10025	J141	53	556	.5	7151
S9717806		+10050	J141	163	525	.6	6217
S9717807		+10075	J141	575	272	1.4	4834
S9717808		+10100	J141	1170	455	3.6	8510
S9717809		+10125	J141	368	346	2.4	8837
S9717810		+10150	J141	291	378	1.5	5023
S9717811		+10175	J141	59	334	.9	4130
S9717812		+10200	J141	77	332	.6	5029
S9717813		+9600	J140	20	222	<.4	1912
S9717814		+9625	J140	23	153	<.4	2348
S9717815		+9650	J140	74	294	<.4	2324
S9717816		+9675	J140	26	171	<.4	2696
S9717817		+9700	J140	75	335	.4	3639
S9717818		+9725	J140	79	278	<.4	4005
S9717819		+9750	J140	29	274	<.4	2146
S9717820		+9775	J140	20	167	<.4	1707
S9717821		+9800	J140	46	289	<.4	2861
S9717822		+9825	J140	35	313	<.4	4647
S9717823		+9850	J140	26	183	<.4	2829
S9717824		+9875	J140	68	609	.5	3913

LAB NO.	FIELD NUMBER	East+ West-	North+ South-	Pb ppm	Zn ppm	Ag ppm	Ba ppm
S9716590	51253 MOSMATT	+0	+0	44	575	.7	

I=insufficient sample X=small sample E=exceeds calibration C=being checked R=revised
If requested analyses are not shown ,results are to follow

ANALYTICAL METHODS
- Pb Reverse Aqua Regia / AAS
- Zn Reverse Aqua Regia / AAS
- Ag Reverse Aqua Regia / AAS
- Ba X-Ray fluorescence / loose powder

TECK/ELF-X97

Job V 97-0653R

PROJECT #1754 Report date 20 AUG 1997

LAB NO	FIELD NUMBER	Pb ppm	Zn ppm	Ag ppm	Ba(4) ppm
R9714660	51252	<4	169	1.2	E128465

I=insufficient sample X=small sample E=exceeds calibration C=being checked R=revised
If requested analyses are not shown ,results are to follow

ANALYTICAL METHODS

Pb Aqua regia decomposition / AAS
Zn Aqua regia decomposition / AAS
Ag Aqua regia decomposition / AAS
Ba(4) X-Ray fluorescence / pressed pellet

APPENDIX IV:

ANALYTICAL PROCEEDURES

COMINCO EXPLORATION RESEARCH LABORATORY
ANALYTICAL METHODS PERFORMED ON TECK SAMPLES

Reverse Aqua Regia / AAS (Cu, Pb, Zn analysis)

0.5 grams per sample is weighed into clean dry test tubes. 1 mL of concentrated Nitric acid and 3 mL concentrated Hydrochloric acid are added. Test tubes are placed on a sand bath at 90° - 95° for 3 hours and shaken at intervals of 20 minutes. Samples are cooled to room temperature then diluted to 20 mLs with de-ionized distilled water. Solids are given time to settle. The samples are then analyzed on a Atomic Absorption Spectrophotometer. Quality control standards are inserted every 15 samples and repeats every 10 samples.

X-RAY FLUORESCENCE / LOOSE POWDER (Ba - pressed pellet)

5 grams of 100 - 200 mesh sample are milled with 5 grams Boric acid for 3 minutes. The milled samples are then pressed at a pressure of 20 tonnes per square inch for 50 seconds to produce 40 mm pressed pellets. Different excitation X-ray tubes are employed to analyze different trace elements to try to get the maximum intensities and high resolution with overlapped element peaks. All trace element analysis calibration curves are set up by using commericial standards. Compton scattering calculation is used to compensate absorption and anhancement effects. Every 25 samples prepared includes 1 repeated sample and every 10 samples analysed includes running 1 commerical standard.

APPENDIX V:

SOIL SAMPLE DESCRIPTIONS

1989	SOIL SAMPLES				PROPERTY PROJECT ELF						SAMPLER BW	
SAMPLE NO.	GRID LOCATION	DEPTH (cm)	THICK (cm)	HORIZON	COLOUR	PARTICLE SIZE	FRAGMENTS %	ROUND	COMP	SLOPE	SEEPAGE	COMMENTS
104-N	9975-E	50		BF	BR		-	VA				
104-N	9950-E	60		BF	BR			VA				SLIGHTLY CLAYEY
104-N	9925-E	50		BF	BR			VA				
104-N	9900-E	50		BF	BR			VA				T ON BOTTOM BM?
104-N	9875-E	60		BF	BR			VA				
104-N	9850-E	60		BF	BR			VA				
104-N	9825-E	60		BF	BR			VA				
104-N	9800-E	60		BF	BR			VA				
104-N	9775-E	60		BF	BR			VA				
104-N	9750-E	50		T	GR			VA				
104-N	9725-E	50		BF	BR			VA				
104-N	9700-E	50		BF	BR			VA				T ON BOTTOM BM?
104-N	9675-E	60		BF	BR			SA				
104-N	9650-E	70		T	GR			VA				
104-N	9625-E	50		BF	BR			VA				
104-N	9600-E	60		BF	BR			VA				
104-N	9575-E	50		BF	BR			VA				
104-N	9550-E	70		BF	BR			VA				
104-N	9525-E	80		T	GR			VA				HIT FROST
104-N	9500-E	80		T	GR			VA				
105-N	9500-E	60		BT	GR			SA				
105-N	9525-E	50		BT	GR			SA				
105-N	9550-E	50		BT	GR			SA				
105-N	9575-E	60		BF	RB			VA				
105-N	9600-E	40		BF	RB			VA				
105-N	9625-E	70		BT	GR			VA				
105-N	9650-E	30		BF	RB			SA				
105-N	9675-E	60		BF	RB			SA				
105-N	9700-E	50		BT	GR			SA				
105-N	9725-E	40		BF	RB			VA				
105-N	9750-E	40		BF	RB			VA				
105-N	9775-E	80		BF	RB			VA				

1991	SOIL SAMPLES			PROPERTY PROJECT ELF						SAMPLER BW		
SAMPLE NO.	GRID LOCATION	DEPTH (cm)	THICK (cm)	HORIZON	COLOUR	PARTICLE SIZE	FRAGMENTS %	ROUND	COMP	SLOPE	SEEPAGE	COMMENTS
E-105N	9800-E	56		BF	RB			VA				
E105-N	9825-E	40		BF	RB			VA				
E-105-N	9850-E	50		BF	RB			VA				
E-105-N	9875-E	40		BF	RB			SA				
E105-N	9900-E	40		BF	RB			VA				
E-105N	9925-E	50		BF	RB			VA				
E-105N	9950-E	20		BF	RB			VA				
E-105N	9975-E	30		BF	RB			VA				
						E-106N						
E-106-N	9975-E	36		BF	RB			VA				
E-106-N	9950-E	30		BF	RB			VA				
E-106-N	9925-E	30		BF	RB			VA				
E-106-N	9900-E	30		BF	RB			VA				
E-106-N	9875-E	20		BF	RB			VA				POOR
E-106-N	9850-E	50		BF	RB			VA				
E-106-N	9825-E	50		BF	RB			VA				
E-106-N	9800-E	40		BF	RB			VA				
E-106-N	9775-E	40		BF	RB			VA				
E-106-N	9750-E	50		BF	RB			VA				
E-106-N	9725-E	30		BF	RB			VA				
E-106N	9700-E	40		BF	RB			VA				CLAEY
E-106-N	9675-E	30		BF	RB			VA				CLAEY
E-106N	9650-E	40		BT	GR			VA				
E-106-N	9625-E	40		BT	GR			VA				
E-106-N	9600-E	50		BT	GR			VA				CLAEY
E-106-N	9575-E	60		T	GR			VA				
E-106-N	9550-E	80		T	GR			VA				
E-106-N	9525-E	90		T	GR			VA				
E-106-N	9500-E	80		T	GR			VA				
						E-111N						
E-111-N	9975-E	40		BF	RB		2	SR				
E-111-N	9950E	50		BF	RB			SR				QUARTZ

1991 SOIL SAMPLES PROPERTY PROJECT ELF SAMPLER BW

SAMPLE NO.	GRID LOCATION	DEPTH (cm)	THICK (cm)	HORIZON	COLOUR	PARTICLE SIZE	FRAGMENTS %	FRAGMENTS ROUND	COMP	SLOPE	SEEPAGE	COMMENTS
E-111N	9925 E	60		BF 10% BT 90%	RB GR		2	VA				
E-111-N	9900-E	30		BF	RB		25	SR				
E-111-N	9875-E	100		BF T	RB-10%		25	SR				SLIGHTLY CLAEY
E-111-N	9850-E	40		T BF	GR-50% RB 50%			SR VA				
E-111-N	9825-E	70		BF	RB		20	VA				
E-111-N	9800-E	70		BF	RB		15	VA				OUTCROP 9798E
E-111-N	9775-E	40		BT	GR		50	VA				
E-111-N	9750-E	60		BT	GR		75	VA				
E-111-N	9725-E	50		BT	GR		45	SA				
E-111-N	9700-E	70		T ORGANIC	GR 20%		1	VA				POOR
E-111-N	9675-E	60		T ORGANIC	w/t BL			?				POOR
E-111-N	9650-E	70		BF	RB		20	VA				POOR
E-111-N	9625-E	60		BT	GR		15	VA				
E-111N	9600-E	90		BT	GR		40	SA				
						E-112	N					
E-112-N	9600-E	30		BF	RB		20	VA				
E-112-N	9625-E	90		BT	GR		40	VA				
E-112-N	9650-E	90		BT?	GR	SANDY						WATER SAT
E-112-N	9675-E	90		BT	GR	SANDY		VA				WATER SAT
E-112-N	9700-E	90		BT	GR	SANDY		VA				WATER SAT
E-112-N	9725-E	90		BT	GR	SANDY		SA				WATER SAT
E-112-N	9750-E	40		BT	GR		25	VA				
E-112-N	9775-E	30		BT	GR		10	SA				
E-112-N	9800-E	40		BT	GR	FINE						SILTY
E-112-N	9825-E	30		BT	GR	FINE	25	VA				
E-112-N	9850-E	50		BT	GR		25	VA				
E-112-N	9875-E	60		BT	GR	SLIGHTLY CLAEY	10	VA				
E-112-N	9900-E	40		BT	GR		10	SA				
E-112-N	9925-E	40		BT	GR		5	SA				
E-112-N	9950-E	60		BT	GR		15	VA				WATER SAT
E-112-N	9975-E	50		BT	GR			SA				

1991	SOIL SAMPLES				PROPERTY PROJECT ELF						SAMPLER BW	
SAMPLE NO.	GRID LOCATION	DEPTH (cm)	THICK (cm)	HORIZON	COLOUR	PARTICLE SIZE	FRAGMENTS %	FRAGMENTS ROUND	COMP	SLOPE	SEEPAGE	COMMENTS
E-113-N	10000-E	60		BF	BR		30	VA				
E-113-N	9975-E	40		BF	BR		30	SA				
E-113-N	9950-E	30		BF	BR		30	SA				
E-113-N	9925-E	60		BF	BR		40	SA				
E-113-N	9900-E	30		BF	BR		99	VA				
E-113-N	9875-E	30		T	GR		60	VA				CR
E-113-N	9850-E	50		T	GR		10	VA				
E-113-N	9825-E	60		T	GR		25	SR				
E-113-N	9800-E	70		T	GR		30	SA				ROUND ROCKS ON TOP
E-113-N	9775-E	40		T	GR		15	VA				FROST
E-113-N	9750-E	40		T	GR	SILT	5	VA				
E-113-N	9725-E	30		T	GR		50	VA				
E-113-N	9700-E	30		T	GR	SANDY	40	VA				
E-113-N	9675-E	60		BF	RB		30	VA				
E-113-N	9650-E	60		T	GR	SANDY	30	VA				
E-113-N	9625-E	50		T	GR	CLAEY	30	VA				
E-113-N	9600-E	40		T	GR	SILTY CLAEY	40	VA				
E-113-N	9575-E	50		T	GR		40	VA				
E-113-N	9550-E	50		T	GR		35	VA				
E-113-N	9525-E	50		T	GR		10	VA				
						EHLWOON						
E-114-N	9500-E	40		T	GR	CLAEY		VA				
E-114-N	9525-E	50		BF	RB		50	SR				
E-114-N	9550-E	70		?								
E-114-N	9575-E	40		BF	RB	SANDY		SR				
E-114-N	9600-E	40		T	GR			SA				
E-114-N	9625-E	50		BF	RB			VA				
E-114-N	9650-E	40		BF	RB		40	VA				
E-114-N	9675-E	90		T	GR	SANDY	40	VA				
E-114-N	9700-E	60		BF	RB GR	"		SR				POOR
E-114-N	9725-E	60		T	GR			SR				WATER SAT
E-114-N	9750-E	3		BF	RB			SA				

1989 SOIL SAMPLES PROPERTY PROJECT ELF SAMPLER BW

SAMPLE NO.	GRID LOCATION	DEPTH (cm)	THICK (cm)	HORIZON	COLOUR	PARTICLE SIZE	FRAGMENTS %	ROUND	COMP	SLOPE	SEEPAGE	COMMENTS
E-114-N	9775-E	40		T	GR		-	VA				
E-114-N	9800-E	70		T	GR		15	SA	CL			
E-114-N	9825-E	36		T	GR		15	VA				
E-114-N	9850-E	40		BF	BR		10	VA				
E-114-N	9875-E	30		BF	BR		5	VA				
E-114-N	9900-E	40		BF	BR		15	SA	CL			
E-114-N	9925-E	30		BF	BR		15	VA				BR ON BOTTOM
E-114-N	9950-E	100		T	GR		15	VA				
E-114-N	9975-E	50		T	GR		15	VA	CL			
E-114-N	10000-E	60		T	GR		30	SA	CL			
113+50N	10000-E	100		T	GR		10	SA	CL			
L						E-1600	N					
E-116-N	9500-E	60		BF	RB			SA				POOR
E-116-N	9525-E	40		BT	GR			SA				
E-116-N	9550-E	56		BT	GR			SA	CL			
E-116-N	9575-E	40		BF	RB			SA				
E-116-N	9600-E	56		BT	GR			SA				
E-116-N	9625-E	46		T	GR			SA				
E-116-N	9650-E	70		BF	RB			SA				POOR
E-116-N	9675-E	96		BF	RB			SA				POOR
E-116-N	9700-E	70		BT	GR			SA				
E-116-N	9725-E	100		BF	RB			VA				
E-116-N	9750-E	100		BF	RB GR			VA	CL			
E-116-N	9775-E	100		BF	RB GR			SA				POOR
E-116+50-N		80		BT	GR		0		SL			
						E-117	N					
E-117-N	9975-E	30		BT	GR		45	VA				
E-117-N	9950-E	60		BT	GR		30	SA	CL			
E-117-N	9925-E	60		BT	GR		10	SA	CL			
E-117-N	9900-E	60		BT	GR		35	VA	CL			
E-117-N	9875-E	70		BT	GR		60	VA				FINE BROKEN
E-117-N	9850-E	70		BT	GR		65	SA	CL			

1991	SOIL SAMPLES				PROPERTY PROJECT ELF						SAMPLER BW	
SAMPLE NO.	GRID LOCATION	DEPTH (cm)	THICK (cm)	HORIZON	COLOUR	PARTICLE SIZE	FRAGMENTS %	FRAGMENTS ROUND	FRAGMENTS COMP	SLOPE	SEEPAGE	COMMENTS
E-117-N	9825-E	50		BT	GR		65	SA				CR
E-117-N	9800-E	40		BT	GR		50	SA				CR
E-117-N	9775-E	30		BT	GR		50	SA/SR				
E-117-N	9750-E	50		BT	GR		35	SA	CL			
E-117-N	9725-E	100		BT	GR		20	SA/SR				
E-117-N	9700-E	80		BT	GR		45	SR				
E-117-N	9675-E	50		BT	GR		50	VA				
E-117-N	9650-E	50		BT	GR		70	VA				
E-117-N	9625-E	60		BT	GR		20	VA	SA			
E-117-N	9600-E	40		BT	GR		25	WR VA	SA			
E-117-N	9575-E	30		BT	GR		25	VA	SA			
E-117-N	9550-E	60		BT	GR			SA	SA			
E-117 N	9525-E	40		BF	RB			SA	SA			
E-117-N	9500-E	20		BF	RB			SR				

1989 **SOIL SAMPLES** **PROPERTY PROJECT** ELF GRID **SAMPLER** RF

SAMPLE NO.	GRID LOCATION	DEPTH (cm)	THICK (cm)	HORIZON	COLOUR	PARTICLE SIZE	FRAGMENTS %	ROUND	COMP	SLOPE	SEEPAGE	COMMENTS
E 116N	-98+00E	120	10	BT	LB	S/C	15	A	SH	5E		Poor Clayey
E 116N	-98+25E	60	8	BT	LB	"	"	"	"	"		" "
E 116N-	98+50E	60	10	BT?	LB/Gy	S/C	20	SA/A	"	"		Poor, Clayey (could be Leached)
E 116N	-98+75E	110	10	BT? C?	"	"	"	"	"	"		" " "
E 116N	-99+00E	90	10	BF/BT	LB	S/C	20	SA/A	SH	"		Below Leached Black Mixed Hor.
E 116N-	99+25E	60	10	BF/C	LB/Gy	"	"	"	"	10E		Poor 'C' or Leached? Clayey
E 116N	-99+50E	110	10	BT/C?	LB/Gy	"	"	"	"	15E		" "
E 116N	-99+75E	110	10	BT/BF	LB	"	"	"	"	20E		" Browner Sampler "
E 116N-	100+00E	115	10	"	"	"	"	"	"	5E		Below Be Sandy Hor.
E 115+50N	-100+00E	50	10	T	Gy	S/S	40	A	SH	"		Talus or 'C' near Bedrock
E 115N-	100+00E	110	15	T	"	"	"	"	"	"		Talus or Parent Mat. 'C'?
E 115N-	99+75E	70	10	BT/BF	LB	S/C	20	SA	"	10E		Below Leached
E 115N-	99+50E	110	10	BT/T?	LB/GY	S/C	25	SR/A	"	10E		Bel. Leach. + Mineral?
E115N-	99+25E	"	"	"	"	"	"	"	"	"		"
E115N-	99+00E	110	10	BT?	LB/Gy	S/C	20	SA	SH	5E		
E115N-	98+75E	80	10	T?	LGy	S/C	"	"	"	"		Poor
E115N-	98+50E	70	10	T/BT?	LGy	"	"	"	"	"		Poor
E115N-	98+25E	60	10	T/BT?	LtG/BR	"	"	"	"	"		Below calcrete horiz.
E 115N-	98+00E	30	10	BM?	MB	S/S	"	"	"	"		Above Calcrete Layer @ 50 cm.
E 115N-	97+75E	20	10	?	M-D BR	"	15	SA	"	"		Calcrete @ ~40cm can't get through
E 115N-	97+50E	50	10	?	M BR	"	25	"	"	"		@ Top of Calcrete layer.
E 116N-	97+25E	65	10	C?	D.Gy	S/C	20	SR/A	SH SLTS	"		Talus or 'C' + Ground up Rock + clay. Moist.
E115N-	97+00E	50	10	BF	YB	S/C	20	"	"	"		Below dk gy clayey talus Mat.
E 115N-	96+75E	50	10	T	BlK	C	30	"	SH.	"		Ground up sh + clay same as above Prev. Sample.
E 115N-	96+50E	50	10	T	M BR	S/S	35	SA/A	SH/SLTS +	10E		Sandy/Talusy Material
E 115N-	96+25E	50	10	BF?	M BR	S/S	30	SA/A	SLTS/SH	5E		Taken 10 m E of 96+25 Swampy at 96+25
E 115N-	96+00E	50	10	B?	M BR	"	25	SA	SLTS TR SH	"		Very Poor BM?
E 115N-	95+75E	40	10	B?	"	Sandy + silt	35	SA	SLTS +SH	"		"
E115N-	95+50E	50	10	BF?	LBR	S/S	20	"	"	"		
E 115N-	[illegible]	40	10	BF	"	"	"	"	"	"		
E115N-	95+00E	40	10	BF	"	"	25	"	SH	10E		Good leached above.

1991	SOIL SAMPLES				PROPERTY PROJECT JOEL					SAMPLER BW		
SAMPLE NO.	GRID LOCATION	DEPTH (cm)	THICK (cm)	HORIZON	COLOUR	PARTICLE SIZE	FRAGMENTS %	FRAGMENTS ROUND	FRAGMENTS COMP	SLOPE	SEEPAGE	COMMENTS
J-134-N	9600-E	100		BF	RB		0	--	SIL			
J-134-N	9625-E	91		BF	RB		10	VA	SIL CL			
J-134-N	9650-E	80		BF	BR		0	SA	SIL			
J-134-N	9675-E	70		BT	GR		10	VA	SIL CL			
J-134-N	9700-E	40		BF	BR		15	VA	CL			
J-134-N	9725-E	40		BE BT	BR GR		15	VA	CL			
J-134-N	9750-E	40		BF	BR		20	VA				
J-134-N	9775-E	30		BF	BR		20	VA				5% SAND
J-134-N	9800-E	30		BF	BR		20	VA				
J-134-N	9825-E	46		BF	BR		60	VA				
J-134-N	9850-E	40		BF BT	BR GR		30	VA				POOR
J-134-N	9875-E	50		BF	BR		5	SA	SIL			
J-134-N	9900-E	40		BF	BR		10	VA				
J-134-N	9925-E	60		BT	GR		25	SA SR	SIL			
J-134-N	9950-E	70		BT	GR		30	VA	SIL			
J-134-N	9975-E	70		BF	BR		10	VA	SIL			
J-134-N	10000 E	70		BR			35	VA				
						J-135-N						
J-135-N	9600-E	5		T	GR		5	VA				
J-135-N	9625-E	10		T	GR		95	VA				DECOMPOSED BEDROCK
J-135-N	9650-E	100		T	GR		30	VA				
J-135-N	9675-E	100		T	GR		45	VA				
J-135-N	9700-E	80		T?	GR		5	VA	SAN			POSSIABLE OLD CHANEL
J-135-N	9725-E	60		BF	RB		5	VA	SIL			
J-135-N	9750-E	50		BF	RB		5	SA				
J-135-N	9775-E	20		T-BT?								
J-135-N	9800-E	40		BF	RB/OR		20	VA				
J-135-N	9825-E	30		T	GR		35	VA	CL			DECOMPOSED BEDROCK
J-135-N	9850-E	30		BT BF	Rd 90% GR 10%			VA	CL			
J-135-N	9875-E	30		BT BF	GR Rd		20	VA SA	CL SIL			
J-135-N	9900-E	60		BT BF	GR Rd		15	VA	SIL			
J-135-N	9925-E	26		BF	RB			SA				

1991 SOIL SAMPLES PROPERTY PROJECT JOEL SAMPLER BW

SAMPLE NO.	GRID LOCATION	DEPTH (cm)	THICK (cm)	HORIZON	COLOUR	PARTICLE SIZE	FRAGMENTS %	ROUND	COMP	SLOPE	SEEPAGE	COMMENTS
J-135-N	9950-E	60		BT	GR		15	SA				
J-135-N	9975-E	70		BT	GR		10	SA				
J-135-N	100+00-E	80		BF	RB		15	SR				
134+50N	9600E	70	11	BF	RB		10	SA	SIL			
135+50N		60		T	GR	J-136	N	VA				
J-136-N	9600-E	40		BF	BR		25	VA				
J-136-N	9625-E	80		BF	GR			VA SA				
J-136-N	9650-E	70		BT	GR		25	VA SA				
J-136-N	9675-E	90		BT	GR		15	VA				
J-136-N	9700-E	50		BF	BR		10	VA				
J-136-N	9725-E	60		BT	GR		25	SA				
J-136-N	9750-E	50		BF	BR		20	VA				
J-136-N	9775-E											
J-136-N	9800-E	40		BF	BR			SA	CL			
J-136-N	9825-E	60	BT BF	GR RB				SA				
J-136-N	9850-E	40	BT BF	GR RB				SA				
J-136-N	9875-E	50	BF	RB				SA SR				
J-136-N	9900-E	20		T	GR		90	VA				
J-136-N	9925-E	40		BF	BR		10	VA	CL			
J-136-N	9950-E	60		BF	BR		10	VA SA				
J-136-N	9975-E	50		BF	BR			SA SR				
J-136-N	100+00E	30		BF	BR			VA SA				
						J-137	N					
J-137-N	9600-E	50		BF	BR		10	VA				
J-137-N	9625-E	30		BF	BR		10	SA				
J-137-N	9650-E	50		BF	BR		10	SA				
J-137-N	9675-E	40		BF	BR		20	SA SR				
J-137-N	9700-E	80		BT	GR		20	SA SR	SIL CL			
J-137-N	9725-E	60		BT	GR		20	SA	SIL			
J-137-N	9750-E	50		BT	GR		20	SA SR	SIL			
J-137-N	9775-E	60		BF	BR		5	SA SR	SIL			
J-137-N	9800-E	50		BF	BR		25	SA	SIL			

1991	SOIL SAMPLES					PROPERTY PROJECT JOEL				SAMPLER BW		
SAMPLE NO.	GRID LOCATION	DEPTH (cm)	THICK (cm)	HORIZON	COLOUR	PARTICLE SIZE	FRAGMENTS %	FRAGMENTS ROUND	FRAGMENTS COMP	SLOPE	SEEPAGE	COMMENTS
J-137 N	9825-E	50		BF	BR	SIL	20	SA				
J-137-N	9850-E	50		BF	BR	SIL	20	SA				
J-137-N	9875-E	60		BT	GR	SIL	25	SA				
J-137-N	9900-E	40		BF				VA SR				
J-137 N	9925-E	56		T BT	GR MB			VA				
J-137-N	9950-E	40		T BT	GR MB			SA VA				
J-137-N	9975-E	30		BF	B-R			VA SA				
J-137-N	100+00-E	30		BF	BR			SA SR				
137+50N	9600 E	66		BT	BR	SAN CLY						
						J-138	N					
J-138-N	9600-E	70		BF/BT	BR	SANDY	65	SA				
J-138-N	9625-E	50		BT	GY		40	SA				
J-138-N	9650-E	30		BT	GY		75	SA/SR				
J-138-N	9675-E	30		BT	GY	SAND	90	SA				CK WASH?
J-138-N	9700-E	40		BT	GY		15	SA				
J-138-N	9725-E	50		BT	GY	SAN	15	SA				CREEK
J-138-N	9750-E	60		BT	GY	SAN	10	VA				
J-138-N	9775-E	80		BT	GY		15	SA/SR				
J-138-N	9800-E	60		BT	GY		10	SA				
J-138-N	9825-E	50		BT	GY	CLY	20	SA				
J-138-N	9850-E	40		BT	GY	CLY	25	SA/SR				
J-138-N	9875-E	80		BT	GY	CLY	15	SA				
J-138-N	9900-E	80		BT	GY	SAN	10	SA/SR				
J-138-N	9925-E	40		BT	GY	SAN	30	SA/SR				
J-138-N	9950-E	70		BF	BR	SIL	15	SA				
J-138-N	9975-E	50		BF	BR	SIL	20	SA				
J-138 N	100+00 E	70		BF/BT	BR/GY	SAN/ CLY	20	SA				
J 138+50N	96+00E	60		BF	RB	SILT	5	SA				

1997 **SOIL SAMPLES** **PROPERTY PROJECT** ELF **SAMPLER** BW

SAMPLE NO.	GRID LOCATION	DEPTH (cm)	THICK (cm)	HORIZON	COLOUR	PARTICLE SIZE	FRAGMENTS %	FRAGMENTS ROUND	COMP	SLOPE	SEEPAGE	COMMENTS
J139N	96+00E	60		BF/BT	RB/GY	SIL	15	SA				
↓	96+25E	60		BT	GY	SANDY	30	SA				
	96+50E	50		BF								
	96+75E											
	97+00E											
	97+25E	40		BF	RB	CLY	20	VA				
	97+50E	40		BF	RB	CLY	25	VA				
	97+75E	50		BF	RB	SILT	10	VA				
	98+00E	60		BT	BR	SLT/CLY	10	VA				
	98+25E	50		BT	BR	SLT	15	VA				
	98+50E	40		BT	GY		30	VA				
	98+75E	50		BT	GY		30	VA				
	99+00E	30		BT	BR		60	VA				
	99+25E	40		TF/BT	BR		75	VA				
	99+50E	40		BT	GY		50	VA				
	99+75E	40		TF	GY			VA	SH			CREEK WASH?
↓	100+00E	100		BT	GY		50	VA				
J140+50N	96+00E	50		BF	RB	SILT	15	SA				
J140N	96+00E	40		BF	RB		40	VA				
↓	96+25E	40		BF	RB		20	SA/SR				GOOD LEACHED
	96+50E	60		BF	RB	CLY	10	SR				
	96+75E	70		BF	RB	SILT	15	SR				
	97+00E	60		BF	RB	SILT	20	VA/SA				
	97+25E	60		BF	RB	CLY	15	VA/SA				
	97+50E	60		BF	RB	SAN	15	VA				
	97+75E	60		BF	RB		85	VA				STEEP SIDE HILL
	98+00E	60		BF	RB	SILT	10	SA				
	98+25E	50		BF	RB	SILT	20	SA				
	98+50E	50		BF	RB	SILT	40	SA				
	98+75E	60		BT	GY	CLY	45	SA				
	99+00E	70		BT	GY		65	SA				STEEP
↓	99+25E	40		BT?	GY	SAND	90	SA				CREEKWASH

1997 **SOIL SAMPLES** **PROPERTY PROJECT** ELF **SAMPLER** BW

SAMPLE NO.	GRID LOCATION	DEPTH (cm)	THICK (cm)	HORIZON	COLOUR	PARTICLE SIZE	FRAGMENTS %	FRAGMENTS ROUND	COMP	SLOPE	SEEPAGE	COMMENTS
J140N	99+50E	40		BF/BT	BR/GY	SILT	25	SA				
	99+75E	50		BT	GY		80	SA				
	100+00E	30		BT	GY		90	VA				
	100+25E	60		BT/BF	GY/RB	SILT	90	VA				
	100+50E	50		BT	GY	SANDY	90	VA				POOR
	100+75E	40		BT	GY	SANDY	90	SA				POOR
	101+00E	40		?	GY		100					POOR - CREEK
J141N												
	98+00E	70		BT	BR/GY	SILT	10	SA				
	98+25E	40		BT	GY	SILT	5	SA				
	98+50E	90		BF	BR		40	SA				
	98+75E	80		BT	GY		20	VA				
	99+00E	70		BF	BR	CLY	20	SA				
	99+25E	60		BF		CLY	10	VA				
	99+50E	80		BF	BR		20	SA				
	99+75E	40		BF	BR	SILT	35	SA				
	100+00E	30		TF	GY		40	SA/BR				
	100+25E	70		BF	BR		50	SA				
	100+50E	60		TF	GY		40	VA				
	100+75E	40		BF	BR		36	VA				
	101+00E	40		TF	GY		75	VA				
	101+25E	60		TF	GY		65	VA				
	101+50E	50		TF	GY		70	VA				
	101+75E	40		TF	GY	CLY	60	VA				
	102+00E	50		TF/BT	GY		40	VA				

199197	SOIL SAMPLES				PROPERTY PROJECT ELF					SAMPLER B.W.		
SAMPLE NO.	GRID LOCATION	DEPTH (cm)	THICK (cm)	HORIZON	COLOUR	PARTICLE SIZE	FRAGMENTS %	ROUND	COMP	SLOPE	SEEPAGE	COMMENTS
J142N												
	99+75E	40		BT	Gy	SANDY		VA				WET
	100+00E	40		BF	LB	SILT	10	SA				
	100+25E	30		BF	LB	SILT	10	SA				
	100+50E	30		BF	BR	SILT	15	SA				
	100+75E	30		BF	BR	SILT	15	SA				
	101+00E	40		BF	BR	CLY	40	VA				
	101+25E	50		BF	BR	CLY	70	VA				
	101+50E	50		BF	BR	SILT	10	VA/SA				
	101+75E	60		BF	BR	SILT	15	SA				
	102+00E	50		BF	BR	SILT	30	SA/SR				
[redacted]												
J143N	102+00E	40		BF	RB		80	VA				
	101+75E	50		BF	BR	CLY	60	VA				
	101+50E	80		BF	BR	CLY	95	VA				

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,200

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,200

Legend

- 200 ppm Zn
- 400 ppm Zn
- 800 ppm Zn
- 1600 ppm Zn
- 3200 ppm Zn
- CREEKS
- (H) HELIPAD

R. D. FARMER
GEOSCIENTIST

0 50 100
metres

FIGURE 7

TECK EXPLORATION LTD.
KAMLOOPS, BRITISH COLUMBIA

ELF PROPERTY

ELF GRID
Soil Geochemistry
Pb ppm

DATE DRAWN: AUG. 19, 1997	SCALE: 1:2,500	DWG. NAME: ELF-PB
COMPILED BY: R. Farmer	JOB No: 1755	
DRAWN BY: S.A.	NTS No: 94F/7	

DECLINATION 25°

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,200

Legend

- 1000 ppm Zn
- 2000 ppm Zn
- 4000 ppm Zn
- 8000 ppm Zn
- CREEKS
- (H) HELIPAD

0 50 100
metres

R. D. FARMER

FIGURE 8

TECK EXPLORATION LTD.
KAMLOOPS, BRITISH COLUMBIA

ELF PROPERTY

ELF GRID
Soil Geochemistry
Zn ppm

DATE DRAWN: AUG. 19, 1997	SCALE: 1:2,500	DWG. NAME:
COMPILED BY: R. Farmer	JOB No: 1755	ELF-ZN
DRAWN BY: S.A.	NTS No: 94F/7	

DECLINATION: 25°

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,200

Legend

1 ppm Ag
2 ppm Ag
4 ppm Ag
8 ppm Ag
CREEKS
(H) HELIPAD

0 50 100
metres

R. D. FARMER

FIGURE 9

TECK EXPLORATION LTD.
KAMLOOPS, BRITISH COLUMBIA

ELF PROPERTY

ELF GRID
Soil Geochemistry
Ag ppm

DATE DRAWN: AUG. 19, 1997	SCALE: 1:2,500	DWG. NAME:
COMPILED BY: R. Farmer	JOB No: 1755	ELF-AG
DRAWN BY: S.A.	NTS No: 94F/7	

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,200

Legend

- 10,000 ppm Ba
- 20,000 ppm Ba
- 40,000 ppm Ba
- 80,000 ppm Ba
- CREEKS
- (H) HELIPAD

0 50 100 metres

FIGURE 10

TECK EXPLORATION LTD.
KAMLOOPS, BRITISH COLUMBIA

ELF PROPERTY

ELF GRID
Soil Geochemistry
Ba ppm

DATE DRAWN: AUG. 20, 1997	SCALE: 1:2,500	DWG. NAME: ELF-BA
COMPILED BY: R. Farmer	JOB No: 1755	
DRAWN BY: S.A.	NTS No: 94F/7	

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,200

Legend

100 ppm Pb
200 ppm Pb
400 ppm Pb
800 ppm Pb
CREEKS
(H) HELIPAD

0 50 100
metres

PROFESSIONAL
R. D. FARMER

FIGURE 11

TECK EXPLORATION LTD.
KAMLOOPS, BRITISH COLUMBIA

ELF PROPERTY

JOEL CREEK GRID
Soil Geochemistry
Pb ppm

DATE DRAWN: AUG. 25, 1997	SCALE: 1:2,500	DWG. NAME: JOEL-PB
COMPILED BY: R. Farmer	JOB No: 1755	
DRAWN BY: S.A.	NTS No: 94F/7	

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,200

FIGURE 12

TECK EXPLORATION LTD.
KAMLOOPS, BRITISH COLUMBIA

ELF PROPERTY

JOEL CREEK GRID
Soil Geochemistry
Zn ppm

DATE DRAWN: AUG. 25, 1997	SCALE: 1:2,500	DWG. NAME: JOEL-ZN
COMPILED BY: R. Former	JOB No: 1755	
DRAWN BY: S.A.	NTS No: 94F/7	

GEOLOGICAL SURVEY BRANCH
ASSESSMENT REPORT

25,200

FIGURE 13

TECK EXPLORATION LTD.
KAMLOOPS, BRITISH COLUMBIA

ELF PROPERTY

JOEL CREEK GRID
Soil Geochemistry
Ag ppm

DATE DRAWN: AUG. 25, 1997	SCALE: 1:2,500	DWG. NAME: JOEL-AG
COMPILED BY: R. Farmer	JOB No: 1755	
DRAWN BY: S.A.	NTS No: 94F/7	

25,200

FIGURE 14

TECK EXPLORATION LTD.
KAMLOOPS, BRITISH COLUMBIA

ELF PROPERTY

JOEL CREEK GRID
Soil Geochemistry
Ba ppm

DATE DRAWN: AUG. 25, 1997	SCALE: 1:2,500	DWG. NAME:
COMPILED BY: R. Farmer	JOB No: 1755	JOEL-BA
DRAWN BY: S.A.	NTS No: 94F/7	