REPORT ON

GEOLOGICAL, GEOCHEMICAL AND GEOPHYSICAL

SURVEYS

and

LINE-CUTTING

by

G.R. Peatfield - P.Eng.

on the

BOYA NO. 1-8, B.B. 1 Fr. MINERAL CLAIMS

Situated west of Graveyard Lake
in the Liard Mining Division
59°15'N, 127°30'W

owned by
TEXASGULF CANADA LTD.
work by
TEXASGULF, INC.

April 1979

Vancouver, B.C.

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
NO. 7252

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INTRODUCTION

Location, Access and Terrain

The BOYA property is located immediately northeast of the confluence of the Kechika and Turnagain Rivers, in northeastern British Columbia (see Figure 1). The nearest supply and transportation centre is Watson Lake, Yukon, some 115 km to the northwest.

Access to the claims is presently by helicopter from various points on the Alaska Highway, the nearest being the settlement of Fireside, near the confluence of the Kechika and Liard Rivers some 50 km to the north-northeast. Fixed-wing aircraft can land at Graveyard Lake (see Figure 2). There is no road access to the area.

The claims are located in the extreme southwestern corner of the Liard Plain and cover most of a small hill rising some 300 m above a surrounding gravel-covered area. The maximum elevation on the hill is approximately 1050 m. Local relief is abrupt, especially along the eastern side of the hill (the 'Main Face' area), but the surface is subdued in areas of extensive overburden. Forest cover is essentially complete, commonly comprising dense second growth, in large burned areas, which makes foot travel difficult. Open grass-covered slopes are found on the southern and southeastern portions of the hill. Water on the property is scarce, but abundant supplies are available within a few kilometres.

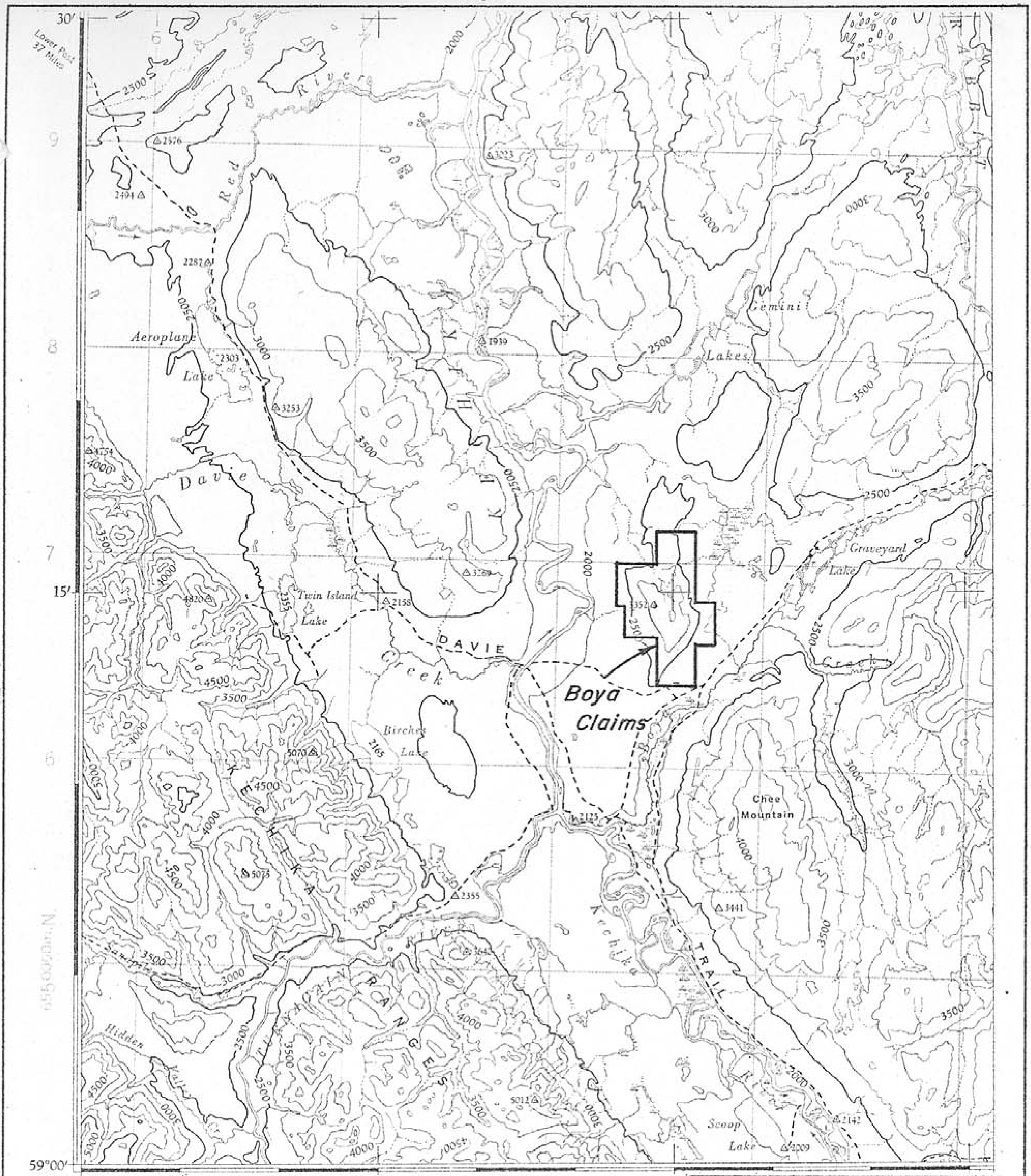
Property History and Definition

The first BOYA claims were located in June 1977, with additional staking during 1978. Work on the property has been completed by Texasgulf, Inc., on behalf of its wholly owned subsidiary, Texasgulf Canada Ltd., the registered owner of the claims. Some of the investigations undertaken early in 1978 have been previously reported on (Peatfield, et al, 1978).

The property consists of eight MGS claims and one fractional claim, totalling 94 units (see Figure 3), covering a raw molybdenum-tungsten prospect on which further work is contemplated.

Figure 1.


LOCATION MAP
BOYA CLAIMS
c. 200 km
ALASKA
YUKON TERRITORY
DISTRICT OF MACKENZIE
WHITEHORSE
YELLOWKNIFE
W.P.& Y.R.
SKAGWAY
WATSON LAKE
BOYA
BRITISH COLUMBIA
FORT NELSON
ALBERTA
B.C.R.
STEWART
FORT St. JOHN
PRINCE RUPERT
TERRACE
B.C.R.
C.N.R.
PRINCE GEORGE
EDMONTON
C.N.R.
C.N.R.
C.P.R.
B.C.R.
KAMLOOPS
CALGARY
VANCOUVER
VICTORIA
U. S. A.



Map Sheet 94 M - "Rabbit River"

Texasgulf Inc.

Figure 2
Detailed Location Map
BOYA CLAIMS

WORK BY	DRAWN BY	DATE	DRW.G NO.

2500 0 2500 5000 7500 10,000

Scale in Metres

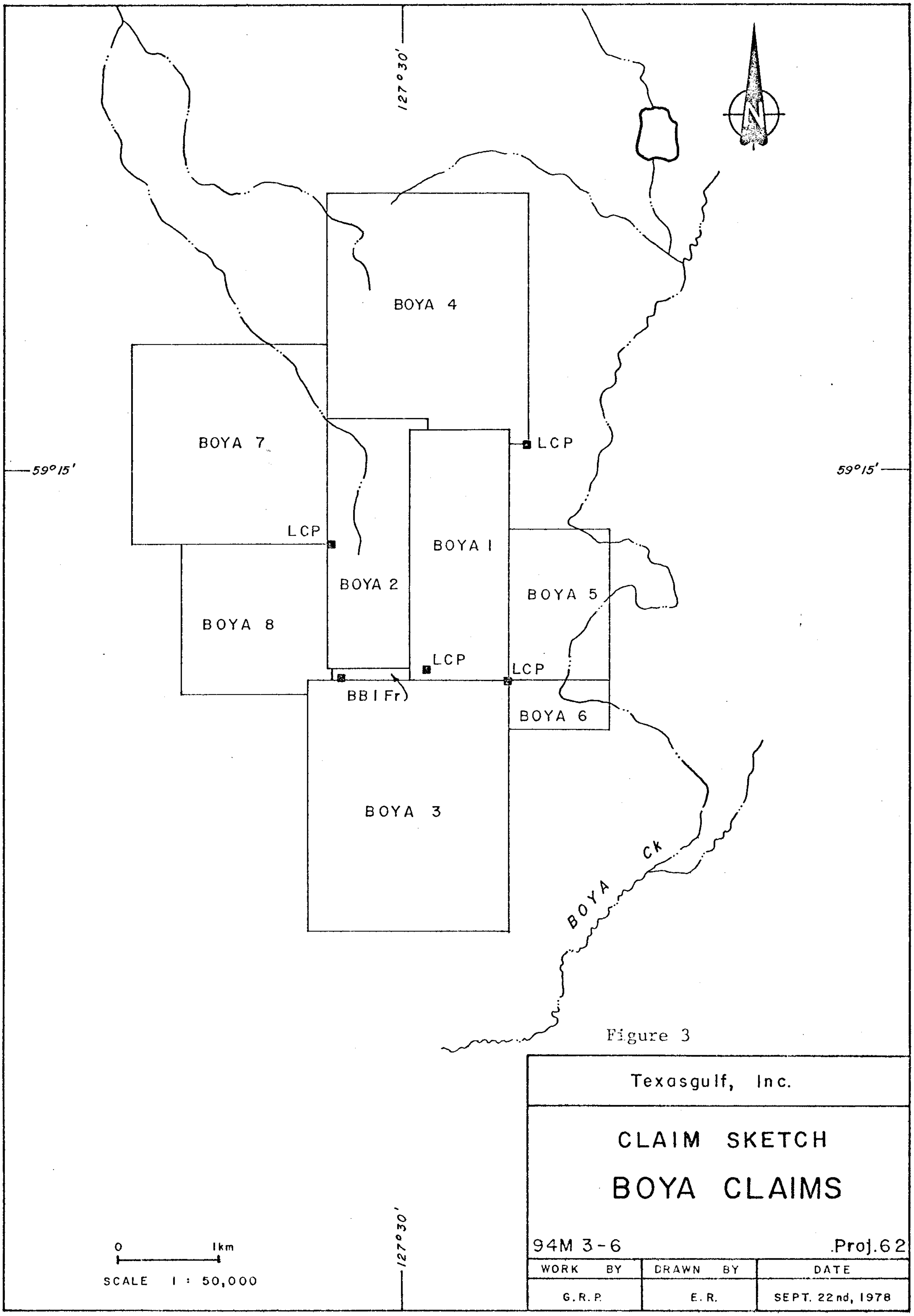


Figure 3

Texasgulf, Inc.

CLAIM SKETCH

BOYA CLAIMS

94M 3-6 Proj.62

WORK BY	DRAWN BY	DATE
G.R.P.	E.R.	SEPT. 22nd, 1978

Summary of Work Completed

Geological investigations

Between June 25 and July 21, G.R. Peatfield and C.J. Rockingham mapped the geology of the claims. Peatfield did some further mapping in September. Mapping was at a scale of 1:5,000 over the entire property, and 1:2,500 in a specific area of interest.

Geochemical survey

During the period Sept. 13-19, a total of 335 soil samples were collected. These were analyzed for Cu, Zn, Mo and W; subsequently, 102 samples were analyzed for Bi.

Ground magnetic survey

D.A. Londry completed a brief ground magnetic survey, totalling 930 readings on 19.9 km of lines, in the period Aug. 26-31. Londry's report is appended to this report.

Line-cutting

Late in the 1978 field season, a two-man crew under contract from BEMA Industries Ltd. undertook a limited programme of line-cutting. The crew cut 2.5 km of line, as shown on Figure 4N.

Work Distribution

The work described in this report was distributed as follows:

Geological - parts of BOYA 1, 2, 3, 7 & 8
Geochemical - parts of BOYA 1, 2, 7 & 8
Magnetics - parts of BOYA 1, 2, 7 & 8
Line-cutting - parts of BOYA 1, 2 & 7

GEOLOGY

Regional Setting

The BOYA property lies within a broad area mapped by Gabrielse (1962) as sedimentary rocks of his Units 1, 4a, 4b and 4c, as follows:

CAMBRIAN AND ORDOVICIAN (mainly) [UNIT 4]

4a, thin-bedded, grey and buff, argillaceous and silty limestone and calcareous phyllite; limestone; intruded by greenstone sills and dykes; includes minor (?) dark grey graptolitic siltstone and shale of early Silurian age along Turnagain River; 4b, black and grey slate, siltstone, sandstone, chert, limestone, calcareous phyllite; may locally include 4a; 4c, undivided 4a, 4b, and 1.

CAMBRIAN AND OLDER [UNIT 1]

Impure grey and green quartzite, siltstone, sandstone, and argillite; calcareous sandstone; brown and black, laminated siltstone; quartz-pebble conglomerate; red and green slate and shale; limestone-cobble and boulder conglomerate; grit, greywacke; intruded by sills and dykes of gabbro and/or diorite.

This area is presently considered by Templeman-Kluit (1977) to form the southern extension of the Selwyn Basin.

Property Geology

Introduction

The geology of the BOYA property is complex and has not been studied exhaustively. The following description is based on approximately five man-weeks fieldwork and the examination of some 15 thin sections. Interpretation of the overall geological picture is made difficult by a low density of outcrop in many critical areas.

In summary, the claims cover an area underlain by a thick section of (presumed) lower Paleozoic sedimentary strata intruded and metamorphosed by a large complex system of Mesozoic(?) quartz-rich porphyritic rocks. This intrusive complex has associated with it several types of mineralization; the most important are pyrrhotite - chalcopyrite - scheelite - clinopyroxene skarns developed in limey strata, and quartz-vein stockworks, in intrusive rocks, carrying molybdenite and scheelite. Various aspects of the property geology are discussed in more detail in the following pages (see Figures 4N, 4S).

Stratified rocks

Several distinctive 'packets' of stratified rocks have been outlined to date. Major difficulties arise in attempts to correlate from one area to another. Many of the stratified rocks have been affected by the intrusive porphyry system; the following descriptions concentrate as much as possible on the original unmetamorphosed rocks.

The best exposed section, on the Main Face (see Figures 5 & 6), consists of at least 490 m of quartzite, calcareous shale, siliceous shale, siltstone and fine sandstone, interbedded shale and limestone, and relatively pure non-calcareous shale with interbedded thin units of pure massive limestone, capped by massive and banded limestone. The section includes, in its upper portion, about 40 m of andesitic flows, volcanic conglomerates with a limey matrix, and finely bedded tuffaceous rocks. Flow rocks and volcanic clasts are markedly amygdaloidal. Most of the rocks in this succession have been metamorphosed, as described in a succeeding subsection.

The prominent uppermost limestone, of unknown thickness but probably in excess of 50 m, consists of massive and locally banded grey and black, somewhat recrystallized grey-weathering limestone and marble. The unit contains at least one thin subunit of thinly bedded limestone and sandy limestone. The massive carbonate unit is widespread over the property; locally it appears to be overlain by dark brown shale, although this occurs in an area of structural complexity and the evidence is not unequivocal.

At the extreme southern end of the hill, in the 'Hawk Pad' area, a prominent limestone unit has local areas of dolomitization towards its upper (?) contact. This 50 m thick unit is repeated and appears to define

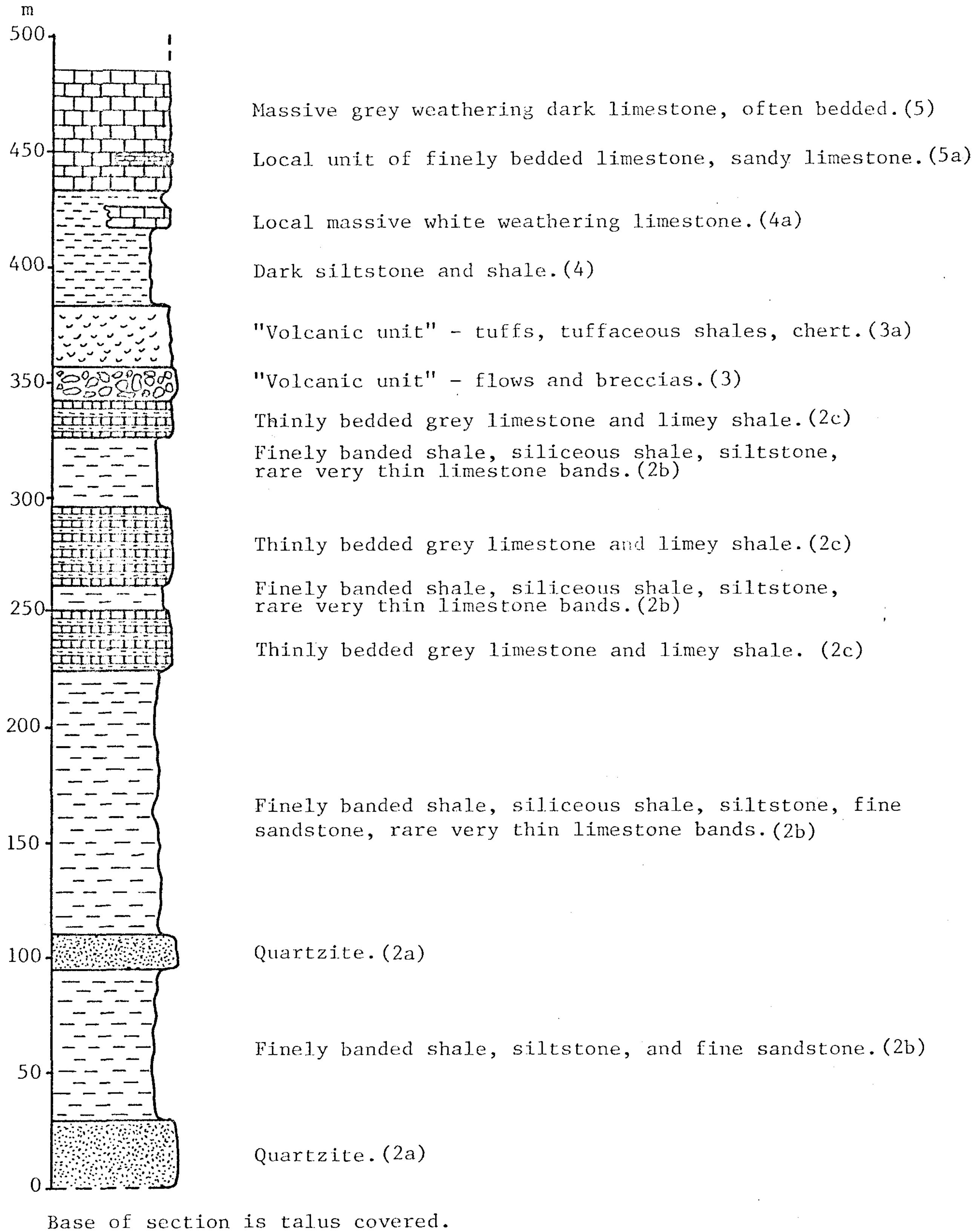


Figure 5. Composite Stratigraphic Section, Main Face Area.

an overturned isoclinal fold. The limestone is apparently underlain by green and purple shales and overlain by a distinctive pebble conglomerate and grit unit. The succession probably does not correlate with that in the Main Face area. Very similar and presumably correlative strata (or at least the shale - limestone - dolomite portion of the section) are exposed much further north, on 'Cut Lip Hill'.

Apparently underlying the major limestone unit in most of the central and western portions of the property is a package of shales and quartz-rich sandstones now mostly converted to hornfels. These rocks are somewhat reminiscent of the uppermost portions of the Main Face succession but apparently have much less limey material. There is at present far too little information available for a more definitive analysis of stratigraphic relationships or possible facies changes within the confines of the claims.

Intrusive rocks

Three varieties of intrusive rock, probably closely related, have been noted. The most widespread and probably most important is a medium grained quartz- biotite - feldspar porphyry (of quartz monzonite or granodiorite composition) which forms irregular dykes, sills and small stocks. Subrounded quartz eyes and small subhedral plagioclase feldspar phenocrysts are abundant; biotite, the only mafic mineral seen, forms small shiny black flakes. The unaltered rock has abundant potash feldspar in the aphanitic groundmass. Alteration phases of this unit are described in a later subsection.

The second intrusive variety is quartz porphyry, which in places might better be termed aplite. This rock is extremely leucocratic and only weakly porphyritic. The groundmass generally contains abundant potash feldspar; some specimens show a few feldspar phenocrysts and rare biotite flakes. It is often difficult to distinguish this rock from metamorphosed quartz sandstone.

The third intrusive type is found only as narrow dykes. The rock is a quartz-feldspar porphyry, consisting of phenocrysts of quartz, plagioclase and potash feldspar (microcline?) set in a dark purplish matrix. In some places the rock also carries small biotite crystals. Quartz veins have not been noted in these dykes.

Structure

The structural geology is obviously complex, and at present too little information has been collected to reach a full understanding of structural relationships. Several observations can, however, be made.

The strata exposed on the Main Face and to the southwest seem to represent a homoclinal succession of sedimentary rocks dipping moderately steeply to the west. The lower portions of the overlying limestone unit above the Main Face are structurally concordant with the underlying strata.

Westward, the picture changes markedly. Unmetamorphosed inter-bedded limestone - shale beds presumably correlative with undeformed strata in the Main Face area are strongly crumpled, with small folds plunging gently south-southeast. Most of the massive limestone unit exhibits steeply dipping compositional banding defining apparently south-southeasterly trending folds with nearly vertical axial planes. Regardless of this fact, the bottom of the limestone (or marble) unit seems to be nearly flat, or at most gently undulatory. Structures in the underlying hornfels unit are much harder to outline, but such bedding attitudes as have been measured are nearly parallel to an almost vertical south-southeasterly striking schistosity (probably an axial plane cleavage), which is remarkably consistent throughout the area.

A preliminary, tentative interpretation is of strong crumpling in the core of a north-northwesterly trending major syncline; outcrop patterns suggest possible modification by cross-folding. Obviously, much more detailed work is necessary before a more refined structural analysis can be attempted.

At the southern end of the property, and possibly separated from the main outcrop area by a major fault, are several good exposures of steeply dipping limestone and clastic sedimentary rocks. The structure here appears, because of an apparent repetition of strata, to consist of a nearly vertical isoclinal anticline, slightly overturned to the east. The significance of this structure with respect to the rest of the property is at present unknown.

Metamorphism

Metamorphic rocks are contained within a large and poorly defined thermal aureole developed above and peripheral to the intrusive porphyry system described above. The nature of the rock produced is a function of the original lithology; three principal thermal metamorphic associations are recognized.

On the Main Face, a unit composed of thinly interbedded shale and limestone has been affected by the intrusive porphyry mass, represented at surface by sills and dykes, and assumed to underly the hill. As one approaches this complex from the south, one sees progressive metamorphism of sedimentary strata. The first noticeable effect is re-crystallization with no apparent movement of ions; pure carbonate bands are still recognizable, intercalated with 'cherty' layers. Closer to the intrusive, there appears to be an abrupt transition to 'porcellanite', a banded rock composed of thin relatively pure layers of clinopyroxene and of re-crystallized quartz. Similar porcellanites are found in the 'Nighthawk Hill' - 'West Hill' area.

In the western portion of the property, a thermal aureole above an intrusive complex contains hornfels derived from fine quartz-rich clastic sediments. The rock, which is dull purplish-brown, and has a subconchoidal fracture, is characterized by the formation of abundant interstitial metamorphic biotite. Some coarser quartzose units have been altered to quartzite; these also show the development of some secondary biotite. The grain-size and amount of biotite seem to increase as distance from intrusive rocks decreases.

The third important association is a diverse family of rock-types. Massive limestone has been variously re-crystallized to form marble, with coarser varieties apparently closest to intrusive rocks. Associated with the marbles are a variety of coarse calc-silicate 'skarns'. Some of these probably represent products of iso-chemical metamorphism; others are possibly metasomatic skarns or "tactites". The former are most often concordant garnet-rich rocks, the latter are dominantly pyrrhotite - diopside skarns with or without quartz. Skarns of the second type sometimes form concordant bodies, but often appear to crosscut the bedding in the marbles. Best developed on Nighthawk and West Hills, they are important because they contain small amounts of chalcopyrite, scheelite, and locally molybdenite. The concordant garnet skarns reach their maximum extent on 'Paint Can Hill'. Pyrrhotite - diopside - quartz skarns occur as thin lenses in porcellanite in the Main Face area.

Alteration

Hydrothermal alteration appears largely confined to rocks of the intrusive porphyry suite, although thin sections of porcellanite immediately adjacent to intrusive contacts have not been examined.

Although only a very few thin sections have been studied, it seems possible to outline a progressive sequence of alteration in the quartz - biotite - feldspar porphyries. The freshest rocks show only a little chloritization of biotite phenocrysts, generally adjacent to quartz veinlets, and a small amount of carbonate - sericite (?) alteration of feldspars. More altered varieties show complete chloritization of biotite, with some development of sericite, and partial to total alteration of feldspars to fine-grained sericite. With increasing intensity of alteration, biotite phenocrysts are converted completely to muscovite and the grain-size of the sericite in feldspar sites increases. The most intensely altered porphyries, which incidentally have abundant quartz veins, show complete replacement of biotite by muscovite, coarse aggregates of sericite in feldspar sites, and coarse muscovite - orthoclase aggregates on the margins of quartz veinlets.

Quartz veining

Quartz veining is extremely common, usually within either intrusive rocks or the more brittle hornfels and porcellanite units. Density of veining ranges from very sparse parallel veins (fewer than two per metre) to intense 'swarms', largely unidirectional, where the vein density may reach 50% of the total rock mass. Locally, intense multidirectional stockworks are developed in intrusive rocks. The veins range in size from microscopic to a few centimetres, with the most common being about two centimetres. The largest vein seen to date is a composite one totalling about 25 cm in width.

Thin section examination of veinlets in intrusive rocks suggests that at least some of these formed by alteration along hairline fractures rather than by open-space filling. Conversely, some veins, especially the apparently late-stage ones with galena and sphalerite mineralization, exhibit cockscomb textures indicative of open-space filling.

A prominent feature of the quartz veining is the marked tendency, within a given area, for veins to be parallel and to dip vertically. This is evident on an outcrop scale, where vein strikes rarely vary by more than 10°, and in larger areas as well. A simple study of this phenomenon, based on plotting dominant vein directions (where noted) for each outcrop, allowed the construction of two rose diagrams, one for the western portion of the property, and one for the Main Face area. These diagrams, which are shown on Figure 4N, indicate that in both regions most of the vein strikes fall within a 30° arc, and that the respective maxima vary by about 45°. Clearly, two populations are represented, although the structural significance of this observation is not understood at the present time.

Mineralization

Several types of sulphide and tungstate mineralization are known to occur on the property; only a few of these are considered of potential economic importance.

Perhaps the most important type of mineralization is exposed in two small areas on the Main Face, where stockworks of quartz veinlets in intrusive rocks and to a lesser extent in porcellanite contain abundant molybdenite. Mineralized veinlets have several orientations and range in thickness from less than one centimetre to as much as eight centimetres. Molybdenite occurs as continuous thin streaks in 'ribbon veins' or as fine selvedges on thinner veins. Some of the veins are brecciated, with fine-grained molybdenite in the fractures. Quartz veins with strong molybdenite mineralization generally have lesser amounts of both scheelite and molybdian scheelite.[1] No coarse rosettes of molybdenite have been seen.

In some areas, again on the Main Face, there are strong 'swarms' of subparallel one-half to two centimetre quartz veins comprising as much as 50% of the rock mass. Such veins may contain moderate amounts of very fine-grained scheelite, with some molybdian scheelite and rare, extremely fine molybdenite. Sampling is very difficult, due to the 'ribby' nature of the rock, but such work as has been done suggests that the tungsten content is erratic and probably does not exceed 0.1% WO_3 over appreciable widths.

Of no direct ecnomic importance, but of considerable geological interest, are various types of sulphide mineralization contained in quartz veins. On the Main Face, above and peripheral to the molybdenum mineralization, quartz veins contain abundant coarse granular pyrite, with traces of galena, sphalerite, chalcopyrite, molybdenite and scheelite. Close to the molybdenum zones, some probably late stage veins contain arsenopyrite. In the western portions of the property, quartz veins are essentially unmineralized except for very rare molybdenite and scheelite.

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1 Powellite is the pure endmember $CaMoO_4$, whereas the material here is more likely scheelite with 1 - 3% MoO_3 substituting for WO_3 (see Little, 1959, p. 2).

Two other types of unimportant but intriguing mineralization have been found in the western area. At two locations south of Paint Can Hill, weakly metamorphosed mudstones and quartz sandstones have been strongly deformed and intensely quartz veined, with irregular veins or segregations which contain considerable chalcopyrite and lesser amounts of pyrite, galena and sphalerite. These occurrences are very small. The second type occurs on Paint Can Hill, and consists of a lens, probably about 30 cm by perhaps 10 m, of semi-massive mineralization in a vertical fracture in marble. Minerals present include arsenopyrite, pyrite, sphalerite, chalcopyrite, and traces of scheelite. A few narrow quartz veins nearby have the same orientation, and rarely contain a little chalcopyrite.

Another potentially important type of mineralization occurs in numerous pods or lenses, ranging from very small to as much as three metres wide and of undetermined length and consisting of massive to semi-massive pyrrhotite mineralization with traces of extremely fine-grained scheelite and chalcopyrite in diopside - quartz skarn, contained either in marble or porcellanite. The larger pods are in marble, in the western portion of the property. The tungsten and copper contents are low, averaging (for 5 assays) approximately 0.09% WO_3 and 0.13% Cu. An interesting and potentially important sub-type of the skarn mineralization occurs in two apparently restricted locations south of West Hill, near a very small intensely quartz-veined intrusive body. Here, clinopyroxene - quartz skarn contains disseminated pyrrhotite, lesser chalcopyrite, traces of scheelite, and appreciable molybdenite.

GEOCHEMISTRY

During September, a short-term programme of soil-sampling was completed, in an attempt to evaluate large areas of the property which have sparse outcrop but which appeared in the basis of geologic mapping to be favourable. Areas of known mineralization were sampled for control purposes. The object of the programme was to establish whether more zones of Mo and W mineralization were exposed at the bedrock surface in such a way as to give rise to coherent soil geochemical anomalies.

The distribution of samples is shown on Figure 7a. A total of 335 samples of B-zone material were taken at regular intervals, on traverses controlled by compass and chain and tied to the existing cut base-line. The minus 80 mesh portions of these samples were analyzed, by Bondar-Clegg and Company Ltd. in North Vancouver, for Cu, Zn, Mo and W; 102 selected samples were later analyzed for Bi.

Details of extraction techniques and analytical methods are as follows:

for Cu, Zn, Mo - hot aqua regia; atomic absorption
for Bi - hot nitric acid; atomic absorption
for W - basic fusion; colourimetric.

The results of the analyses are shown on Figures 7b - f. Strong coherent anomalies exist in all metals but these anomalies are restricted to areas of presently known mineralization. A few erratic weakly anomalous results have no obvious cause. Unfortunately, the anomalies in all metals are coincident and there is very little tendency for the anomalous pattern of any one metal to be more extensive than that of any other, although there is some very slight suggestion of a narrow Zn, Cu, W halo on a Mo core in the Main Face area.

GEOPHYSICS

Ground Magnetics

Appendix A is a short report by D. Londry detailing results of a preliminary ground magnetometer survey over the northwest portion of the property. The results of this work are somewhat disappointing, as they simply confirm the existence of previously known skarn bodies and do not outline any further areas of interest. Magnetic relief over the bulk of the hornfels is remarkably flat.

G. R. Peatfield

G.R. Peatfield, P.Eng.

30/04/79

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APPENDIX A

Ground Magnetic Survey

Report by D.A. Londry

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INTRODUCTION:

Between August 27 and 30, 1978 a reconnaissance magnetic survey was carried out on the Boya Claims in northern British Columbia. The purpose of the survey was to determine the magnetic response over different rock types in the area in hopes of outlining, in particular, mineralized skarn zones around intrusive bodies.

SURVEY DESCRIPTION:

Two base lines were cut and chained. Base Line 8120 North runs from 4000 East to 6040 East and Base Line 4000 East runs from 8120 North to 8960 North.

The survey was carried out with a Geometrics G816. This instrument is a Proton Precession magnetometer which measures the earth's total magnetic field to an accuracy of $\pm$ 1 gamma.

Base stations were established every 120 metres along the two base lines. Intermediate readings were taken every twenty metres.

All other lines were put in by compass and pacing. Readings were taken every twenty-five metres along these traverses. The time taken between base station readings was kept under two hours.

A total of 930 readings were taken on 19.9 kilometers of line.

DIURNAL DRIFT:

Table 1 is a review of geometric activity during the month of

TABLE 1 - THE REVIEW OF GEOMAGNETIC ACTIVITY IN

LA REVISION DE L'ACTIVITE GEOMAGNETIQUE DE MOIS DE

OTTAWA

Geomag. Co-ord.: 57,0° Lat. N., 351,5° Long. E.

active actif	:	3-6, 11-13, 27-31
unsettled agité	:	the rest of August le reste du août
quiet calme	:	15, 20, 26

MEANOOK

Geomag. Co-ord.: 61,8° Lat. N., 301,0° Long. E.

active actif	:	3-6, 12, 27-31
unsettled agité	:	the rest of August le reste du août
quiet calme	:	1-2, 10, 14-16, 20-21, 23-24, 26

August, put out by the Ottawa Magnetic Observatory. Both Ottawa and Meanook stations recorded magnetic disturbances from August 27 to August 31 inclusive. Profiles 1 to 4 show a duirnal drift, as recorded on the Boya property. The nature of the drift can best be seen from 9:00 A.M. to 10:45 A.M. on August 28 where base station readings were taken at one minute intervals (refer to Profile 2). Between 9:00 A.M. and 10:00 A.M. it is characterized by 40-60 gamma peaks during ten minute periods and one drop of approximately 150 gammas within ten minutes. Between 10:00 A.M. anf 10:45 A.M. the drift was much steadier decreasing twenty gammas gradually over the forty-five minutes.

On August 27 a fifty gamma peak was observed between 9:10 A.M. and 9:30 A.M. Two similar peaks were observed on the morning of August 30th.

On August 29 and all the afternoons the drift looks a lot steadier, however, the number of base station readings in these periods was much less.

RESULTS:

The results have been contoured on a map at a scale of 1:5000. The contour interval is 100 gammas.

Two areas of high susceptibility stand out - one in the central portion of the survey area and the other in the northwest. Both coincide with occurrences of pyrrhotite in skarn zones. The rest of the survey area is quite flat magnetically. The small high centered at 8650 North on Line 4360 East occurs within a broad belt of hornfels.

Profiles were drawn for Lines 8120 North and 4000 East because of the good control on the drift (base station readings every two minutes).

Profile 5 is along 8120 North. The data in Profile 5B has been smoothed to elinimate small peaks probably caused by magnetic disturbances. A number of highs occur along the line in the order of 25 to 100 gammas. The highs at 4850 East and 4950 East occur just to the north of the zone of high susceptibility in the center of the grid. The rest of the highs may reflect occurrences of shale.

Profile 6 is along 4000 East. The hornfels and quartz porphyry intrusive appear to be magnetically equivalent. The fine grained siliceous skarn in the north is highly magnetic.

COMMENTS:

Background readings in the western half of the survey area are slightly lower than those in the east half. The west is underlain mainly by intrusives and hornfels. Shale in the southeast appear to have a slightly higher susceptibility than the limestone in the north-east.

All of these variations in the magnetics, however, are within the error of 50 gammas caused by magnetic disturbances.

The fine grained siliceous skarn zones give anomalies of up to 1500 gammas.

G.R. Peatfield

for D.A. Londry

30/04/79

APPENDIX B

Statements of Qualification

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STATEMENTS OF QUALIFICATION

W. Gardiner - Geologist

W. Gardiner holds a B.Sc. degree in Geology from the Memorial University of Newfoundland (1975) and an M.Sc. degree in Mineral Exploration from McGill University, granted in 1978. He has several field season's experience with Texasgulf.

P.C. Hubacheck - Geologist

P.C. Hubacheck holds a B.Eng. degree from the South Dakota School of Mines, granted in 1977. He has had several season's field experience with Texasgulf, and is now on permanent staff with the Company, based in Calgary, Alberta.

D.A. Londry - Geophysicist

D.A. Londry obtained his B.Sc. degree in Earth Sciences from the University of Windsor in 1976. He was employed by Texasgulf Inc. during the 1975 field season as a geophysical assistant. Since graduation he has been employed by Texasgulf as a geophysicist, having joined the permanent staff in January 1977, based in Timmins, Ontario.

C.J. Rockingham - Geologist

C.J. Rockingham obtained his B.Sc. degree in Chemistry & Biology from the University of Toronto in 1972, and has very recently been granted a M.Sc. degree in Geology from the University of Western Ontario. Mr. Rockingham has many season's field experience with Texasgulf in Canada and South Africa, and is highly regarded by his colleagues.

H.R. Schmitt - Geologist

H.R. Schmitt obtained his B.Sc. degree in Geology from the University of British Colubmia in 1977. He has been employed in a variety of positions by Texasgulf Inc., for summer seasons from 1975, and has been continuously employed from April 1978 to the present.

G.R. Peatfield.
30/04/79

APPENDIX C

Statements of Expenditures

STATEMENT OF EXPENDITURES

BOYA PROPERTY

(GEOLOGY)

SALARIES AND BENEFITS - TEXASGULF, INC.			
G.R. Peatfield, P.Eng.			
Periods June 25-July 21; Sept. 13-19. 22 days @ $130.00 =		2,860.00	
C.J. Rockingham, B.Sc.			
Period June 25-July 21. 13 days @ $50.00		650.00	
		3,510.00	3,510.00
ROOM AND BOARD			
35 days @ $30.00			1,050.00
HELICOPTER			
dry-lease Bell G3B1 30 hrs @ $190.00 =	5,700.00		
Texasgulf Bell 206B 2 hrs @ $300.00 =	600.00		
	6,300.00		6,300.00
MISCELLANEOUS			
Travel (pro-rated)	600.00		
Vehicle rental	500.00		
	1,100.00		1,100.00
REPORT PREPARATION			
G.R. Peatfield, P.Eng. - Office Time			
10 days @ $130.00	1,300.00		
Daughting, secretarial, etc.	650.00		
	1,850.00		1,850.00
			13,810.00

pro-rating:			
	BOYA 1978 GROUP =	52%	7,181.20
	HAWK GROUP =	20%	2,762.00
	BOYA #7 =	20%	2,762.00
	MOOSE GROUP =	8%	1,104.80
			13,810.00

G.R. Peatfield -
30/04/79

STATEMENT OF EXPENDITURES

BOYA PROPERTY

(SOIL GEOCHEMISTRY)

SALARIES AND FRINGE BENEFITS - TEXASGULF, INC.

G.R. Peatfield, P.Eng. - Supervision Period Sept. 13-19. 1 day @ $130.00	130.00	
P.C. Hubacheck, B.Eng. Period Sept. 13-19. 5 days @ $85.00	425.00	
W. Gardiner, M.Sc. Period Sept. 13-19. 5 days @ $60.00	300.00	
H.R. Schmitt, B.Sc. Period Sept. 13-19. 5 days @ $50.00	250.00	
	1,105.00	1,105.00

ROOM AND BOARD

16 man-days @ $30.00		480.00

HELICOPTER (Texasgulf Bell 206B)

8 hours @ $300.00		2,400.00

ANALYTICAL COSTS

335 analyses for Cu, Zn, Mo, W @ $6.10 =	2,043.50	
102 analyses for Bi @ $2.00 =	204.00	
	2,247.50	2,247.50

MISCELLANEOUS

Travel (pro-rated)	624.00	
Shipping	50.50	
Auto Rental (pro-rated)	180.00	
	854.50	854.50

REPORT PREPARATION

G.R. Peatfield, P.Eng. - Office Time 4 days @ $130.00	520.00	
Draughting, secretarial, etc.	380.00	
	900.00	900.00
		7,987.00

pro-rating:		
BOYA 1978 GROUP	= 45%	3,594.15
BOYA #7	= 40%	3,194.80
MOOSE GROUP	= 15%	1,198.05
		7,987.00

G. R. Peatfield
30/04/79

STATEMENT OF EXPENDITURES

BOYA PROPERTY

(GROUND MAGNETICS)

SALARIES AND FRINGE BENEFITS - TEXASGULF, INC.

D.A. Londry - Geophysicist Period Aug 26-Aug 31. 5 days @ $110.00	550.00
ROOM AND BOARD	
5 days @ $30.00	150.00
HELICOPTER (Texasgulf Bell 206B)	
2.5 hours @ $300.00	750.00
MISCELLANEOUS	
Travel, shipping, etc.	300.00
REPORT PREPARATION	
Office time, draughting, computer plotting, secretarial, etc.	250.00
	2,000.00

pro-rating:	BOYA 1978 GROUP	= 40%	800.00
	BOYA #7	= 45%	900.00
	MOOSE GROUP	= 15%	300.00
			2,000.00

G.R. Peatfield
30/04/79

STATEMENT OF EXPENDITURES

BOYA PROPERTY
(LINE-CUTTING)

SALARIES AND FRINGE BENEFITS - TEXASGULF, INC.	
G.R. Peatfield, P.Eng. - Supervision August 22nd. 1/2 days @ $130.00	65.00
BEMA INDUSTRIES LTD.	
Invoiced cost for two-man line-cutting crew in the period Aug. 22-31, 1978, including labour, equipment rental, supplies, etc.	3,003.70
ROOM AND BOARD	
20 man-days @ $30.00	600.00
HELICOPTER (Texasgulf Bell 206B)	
8 hours @ $300.00	2,400.00
TRAVEL	
Pro-rated share	240.00
	6,308.70

pro-rating:	BOYA 1978 GROUP	= 45%	2,838.92
	BOYA #7	= 55%	3,469.78
			6,308.70

G.R. Peatfield
30/04/79

7252

LEGEND

INSTRUMENT : Geometric G 816

DATE : August 27 , 1978

TEXASGULF Inc.		
Minerals Exploration Division — Timmins , ONTARIO		
BOYA DIURNAL DRIFT **MAGNETIC SURVEY**		
Profile 1		
Scale :		Data by : Landry
Drawn by : Last	Project Nº :	Date : 08 / 78

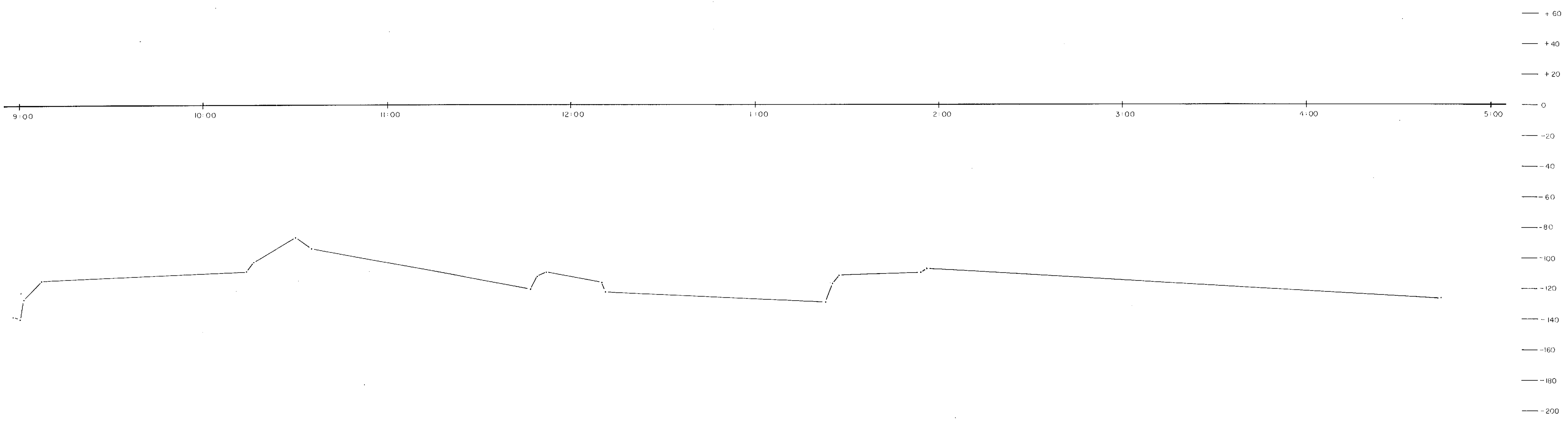
LEGEND

INSTRUMENT : Geometric G 816

DATE : August 28, 1978

7252

TEXASGULF Inc.		
Minerals Exploration Division		Timmins, ONTARIO
BOYA DIURNAL DRIFT MAGNETIC SURVEY		
Profile 2		
Scale :		Data by : Landry
Drawn by : Last	Project N° :	Date : 08 / 78



LEGEND

INSTRUMENT : Geometric G 816

DATE : August 29 , 1978

7252

TEXASGULF Inc.

Minerals Exploration Division Timmins , ONTARIO

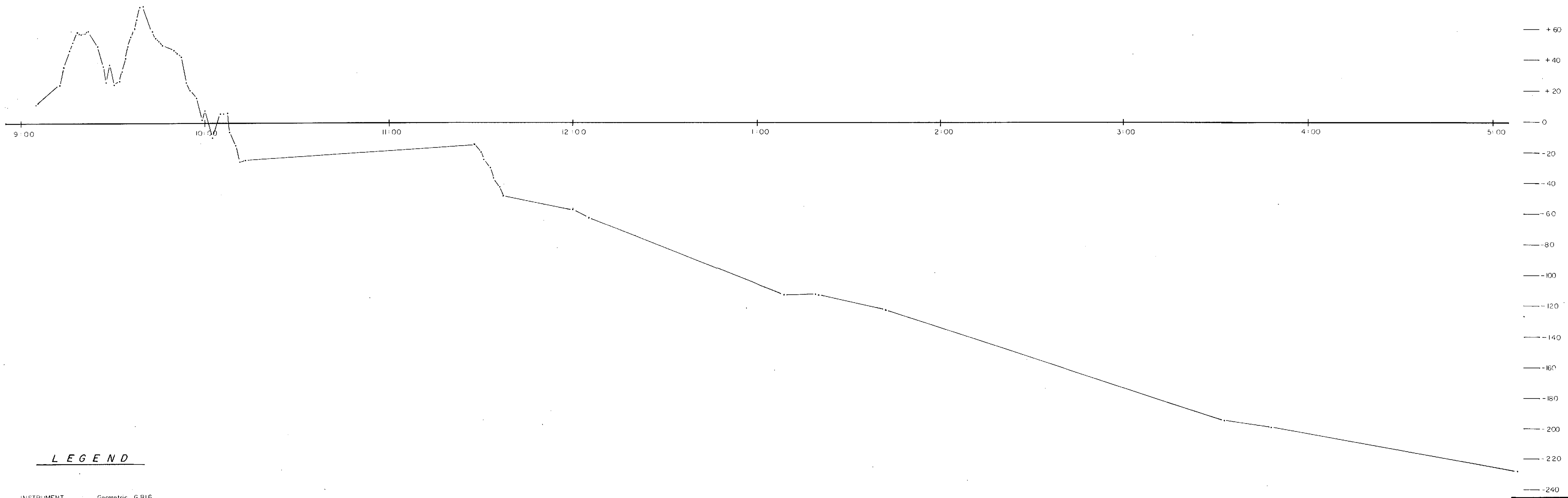
BOYA

DIURNAL DRIFT

MAGNETIC SURVEY

Profile 3

Scale :		Data by : Landry
Drawn by : Last	Project Nº :	Date : 08 / 78



7252

LEGEND

INSTRUMENT : Geometric G 816

DATE : August 30 , 1978

TEXASGULF Inc.

Minerals Exploration Division — Timmins , ONTARIO

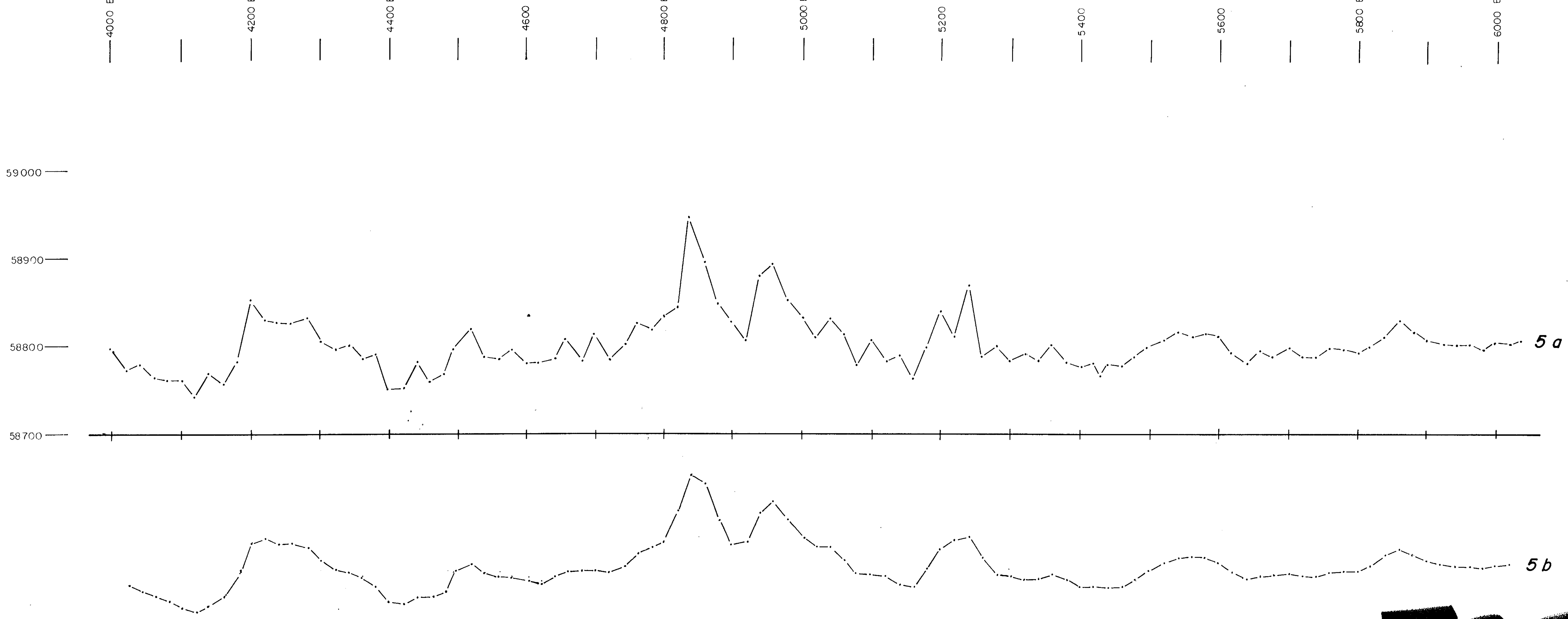
BOYA

DIURNAL DRIFT

MAGNETIC SURVEY

Profile 4

Scale :		Drfn by : Landry
Drawn by : Last	Project NO :	Date : 08 / 78



7252

LEGEND

INSTRUMENT : Geometric G 816

VERTICAL SCALE : 1cm = 50 gammas

TEXASGULF Inc.

Minerals Exploration Division — Timmins, ONTARIO

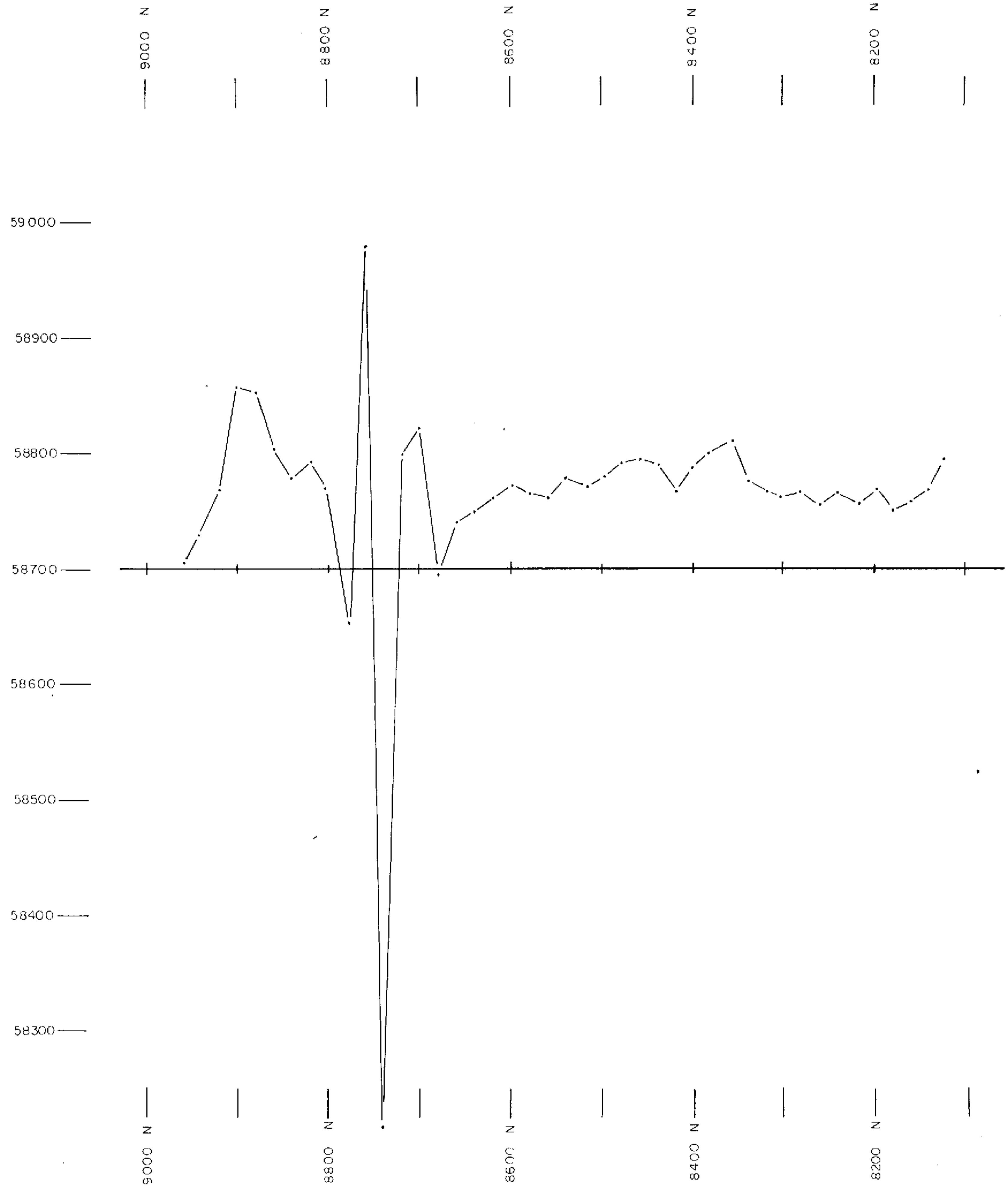
BOYA

MAGNETIC

L 8120 N

Profile 5

Scale : 1 : 5000		Data by : Landry
Drawn by : Last	Project N^{o} :	Date : 08 / 78



LEGEND

INSTRUMENT : Geometric G 816

VERTICAL SCALE : 1 cm = 50 gammas

7252

TEXASGULF Inc.

Minerals Exploration Division — Timmins, ONTARIO

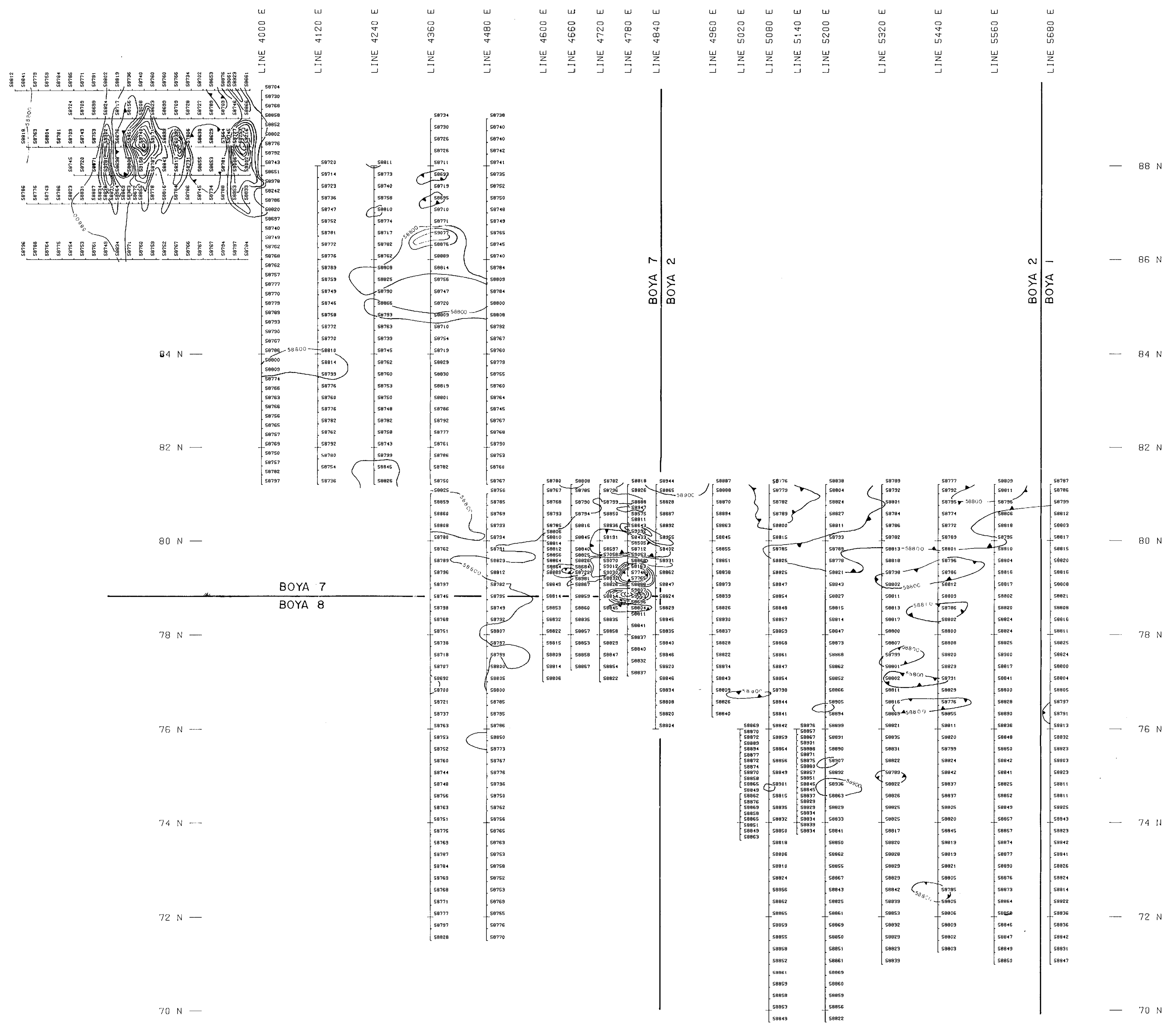
BOYA

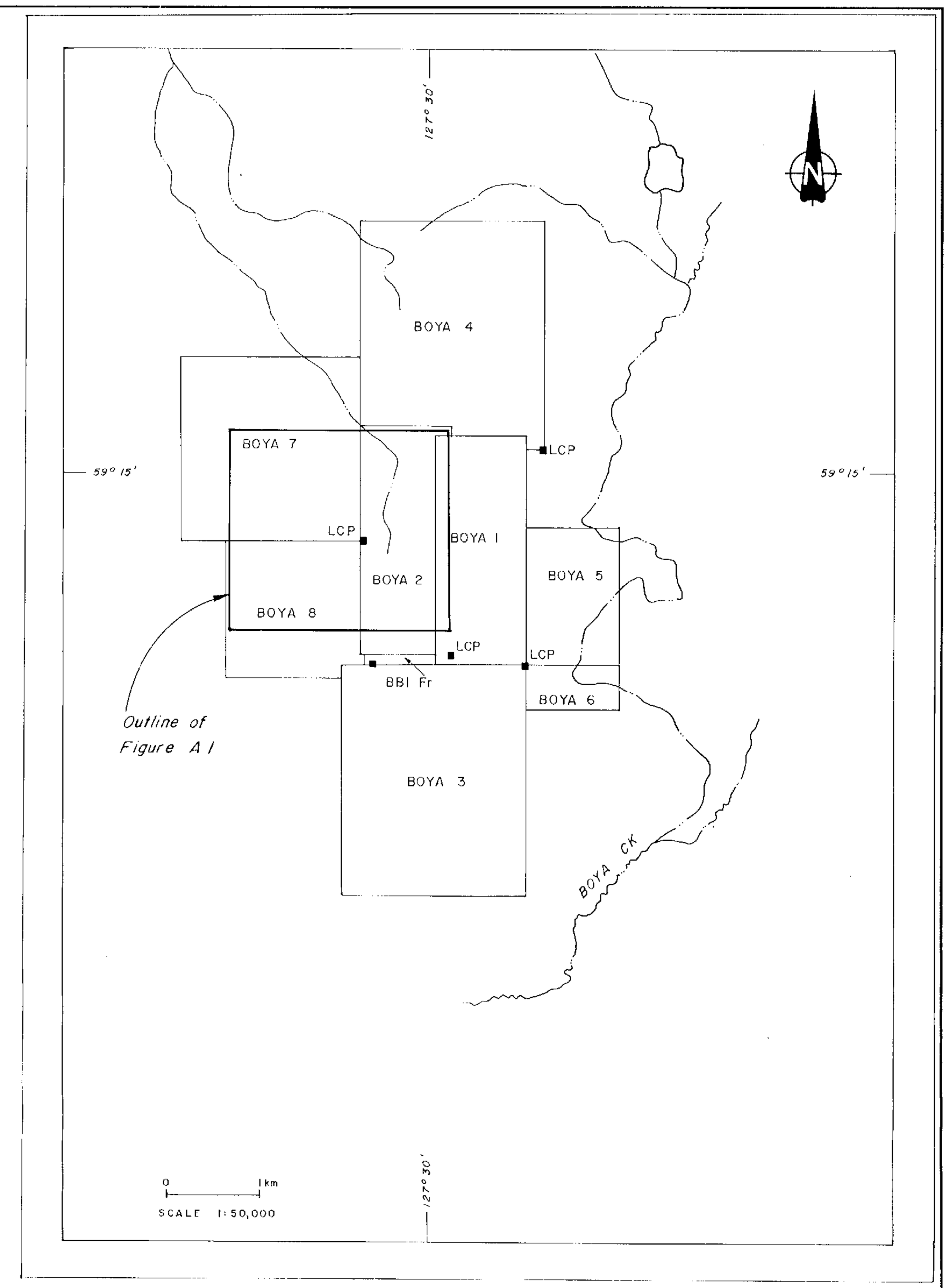
MAGNETIC

L 4000 E

Profile 6

Scale : 1 : 5000.		Data by : Landry
Drawn by : Last	Project Nº :	Date : 08 / 78





LEGEND

7252

G.R. Peatfield for D.A. Landry 30/04/79

Figure A I

0 100 200 300 400 500
METRES (1:5000)

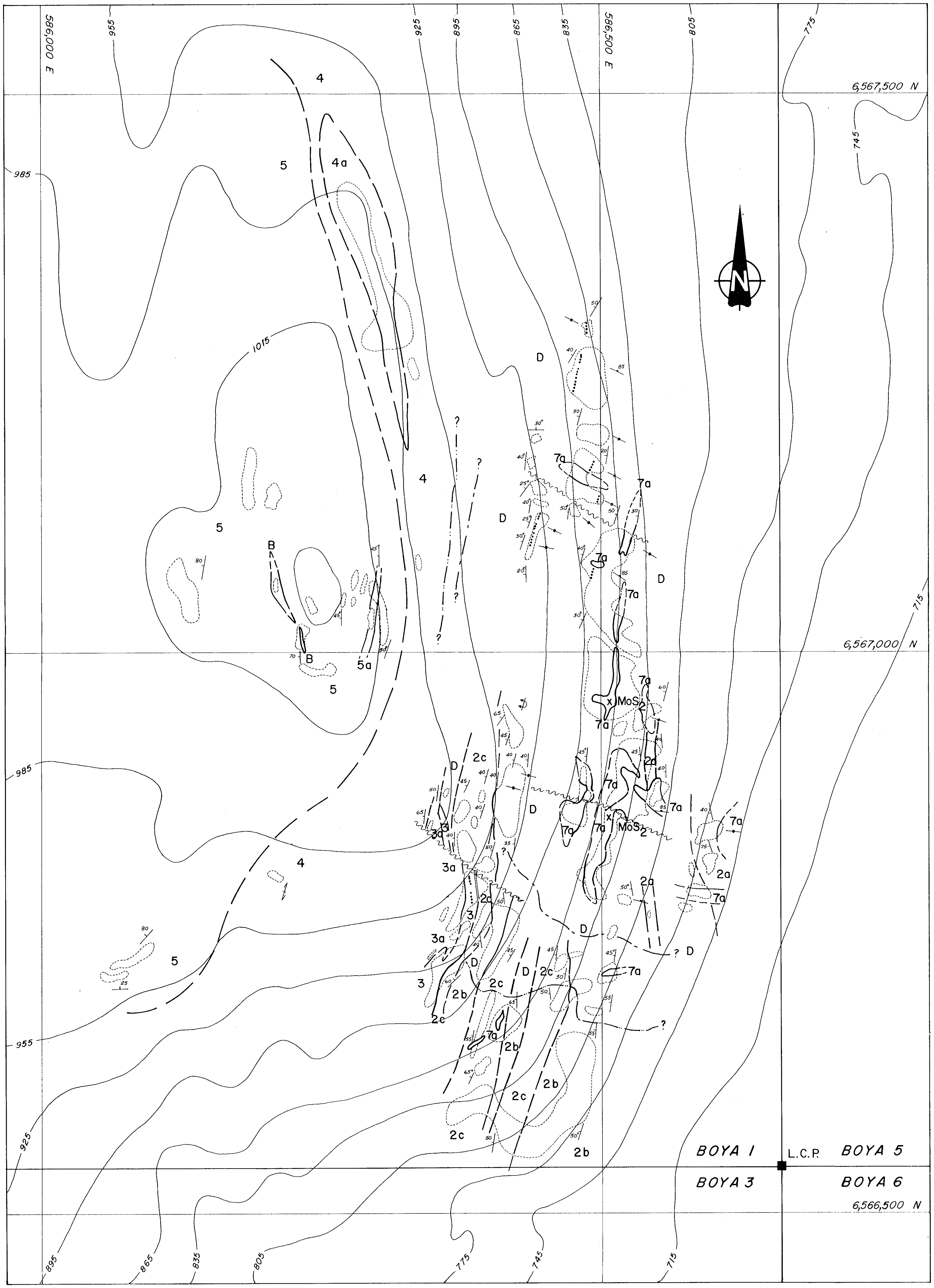
TEXASGULF CANADA LTD.

MAGNETIC SURVEY

BOYA

NTS: 94M PROJ. #62

WORK BY	DATE
	1978



LEGEND

INTRUSIVE ROCKS

7a — Quartz - biotite - feldspar porphyry dykes, sills, and irregular intrusive bodies.

METAMORPHIC ROCKS (Within the thermal aureole of Unit 7c)

D — 'Porcellanite' - fine, banded siliceous skarn, composed of alternating layers of quartz and diopside.

B — Coarse garnet skarn, generally occurring as concordant layers in limestone or marble.

Thin stratiform lenses of pyrrhotite - chalcopyrite - scheelite mineralization in quartz - diopside skarn.

UNMETAMORPHOSED SEDIMENTARY STRATA

5, a — Massive grey weathering limestone, often bedded; a: local unit of finely bedded limestone, sandy limestone.

4, a — Dark siltstone and shale; a: local massive white weathering limestone.

3, a — "Volcanic unit" - andesitic flows and breccias; a: tuffs, tuffaceous shales, chert.

2c — Thinly bedded grey limestone and limey shale.

2b — Finely banded shale, siliceous shale, siltstone, fine sandstone, rare very thin limestone bands.

2a — Quartzite (seen only in the metamorphic zone).

note: Units 2a - c are intercalated.

SYMBOLS

Bedding.

Cleavage.

Jointing.

Joint filled with quartz vein.

Apparent limit of transition to porcellanite in shales and silty rocks.

Apparent limit of complete transition of all rocks except quartzite to porcellanite.

L.C.P. — Legal Corner Post for Mineral Claims.

7252

G.R. Peatfield 30/04/79

Scale 1:2,500 Contour Interval 30 m

Texasgulf Inc.

Figure 6

BOYA CLAIMS

Detailed Geology - Main Face

NTS 94M/3W			Proj 62
WORK BY	DRAWN BY	DATE	DRW'G NO.
G.R.P., C.R.	E.R., G.R.P.	Dec. 1978	

50 0 50 100 150 200

Scale in Metres


583,000 E
584,000 E
585,000 E
586,000 E
587,000 E
6,569,000 N
6,568,000 N
6,567,000 N
805
865
925
985
1045
745
N
BOYA 1
BOYA 2
BOYA 3
BOYA 4
BOYA 5
BOYA 6
BOYA 7
BOYA 8
LCP
SCALE 1 : 50,000
LEGEND
All sample numbers on report sheets are of the form 62-#-78
Cut line traverse
Chain and compass traverse
Chained contour traverse
7252
G.R. Peatfield 30/04/79
Scale 1:5,000
Contour interval 60 m
Figure 7a
Texasgulf Inc.
BOYA CLAIMS
SOIL GEOCHEMISTRY
SAMPLE LOCATIONS
NTS 94M/3W, 4E, 5E, 6W
Proj. 62
WORK BY
DRAWN BY
DATE
DRW,G NO.
G.R.P.
E.R.
SEPT. 1978
Scale in Metres

583,000 E
584,000 E
585,000 E
586,000 E
587,000 E
6,569,000 N
6,568,000 N
6,567,000 N
N
BOYA 4
BOYA 7
BOYA 2
BOYA 1
BOYA 5
BOYA 8
BOYA 6
BOYA 3
LCP
Contour intervals
0 - 7
8 - 15
16 - 30
31 - 60
61 - 120
121 +
Number of samples
Value interval (ppm)
LEGEND
All sample numbers on report sheets are of the form 62 - # - 78
Cut line traverse
Chain and compass traverse
Chained contour traverse
7252
G.R. Peatfield 30/04/79
Scale 1:5,000
Contour interval 60 m
Figure 7 b
Texasgulf Inc.
BOYA CLAIMS
SOIL GEOCHEMISTRY
W in soils (ppm)
NTS 94M/3W, 4E, 5E, 6W
Proj. 62
WORK BY G.R.P.
DRAWN BY E.R.
DATE SEPT. 1978
DRW,G NO.
Scale in Metres

LEGEND

All sample numbers on report sheets are of the form 62 - # - 78

Cut line traverse

Chain and compass traverse

Chained contour traverse

7252 G.R. Peatfield 30/04/79

Scale 1:5,000 Contour interval 60 m

Figure 7c

Texasgulf Inc.

BOYA CLAIMS
SOIL GEOCHEMISTRY

Mo in soils (ppm)

NTS 94M/3W, 4E, 5E, 6W Proj. 62

WORK BY	DRAWN BY	DATE	DRW,G NO.
G.R.P.	E.R.	SEPT. 1978	

100 0 100 200 300 400
Scale in Metres


Rose Diagram showing orientations of quartz veins in the area north and west of Paint Can Hill
total of 28 veins measured
584,000 E
585,000 E
586,000 E
587,000 E
6,569,000 N
6,568,000 N
6,567,000 N
"West Hill"
"Night Hawk Hill"
many small irregular bodies of unit C
Cut Baseline
"Cut Lip Hill"
"Point Can Hill"
"North Pond"
"Moose Hill"
"Main Face"
L.C.P.
L.C.P. Post approx
L.C.P. (Fr)
Rose Diagram showing orientations of quartz veins in the Main Face area
total of 19 veins
See Figure 6 for detail in this area
BOYA 4
BOYA 7
BOYA 1
BOYA 2
BOYA 5
BOYA 8
BOYA 6
BOYA 3
BOYA Ck
Outline of Figure 4 N
SCALE 1 : 50,000
LEGEND
INTRUSIVE ROCKS
7c Quartz - feldspar porphyry dykes.
7b Quartz porphyry, aplite.
7a Quartz - biotite - feldspar porphyry.
METAMORPHIC ROCKS (WITHIN THE THERMAL AUREOLE OF UNITS 7a-c)
D 'Porcellanite' - fine, banded siliceous skarn, alternating layers of quartz and diopside.
C Coarse diopside - quartz skarn, often with appreciable pyrrhotite.
B Coarse garnet skarn.
A Hornfels.
note: Marbles are not mapped separately, but are included with unit 5 below.
UNMETAMORPHOSED SEDIMENTARY STRATA
MAIN FACE SECTION
(see Figure 5 for detailed column)
5 a Massive limestone; a: thin-bedded limestone, sandy limestone.
4 a Dark shale; a: massive white-weathering limestone.
3 'Volcanic unit' - flows, breccias, tuffs, tuffaceous shales, chert.
2c Thinly interbedded limestone and limey shale.
2b Thinly banded shale, limey shale, siliceous shale, fine sandstone.
2a Quartzite (seen only in the metamorphic zone).
note: units 2a - c are intercalated.
NORTHWEST AREA SECTION
6 Dark shale.
5 Massive limestone and marble.
4b Shale, sandy shale, fine sandstone.
correlation uncertain
HAWK PAD SECTION
1d Grit, pebble conglomerate.
1c - Dolomite -
1b - Limestone -
1a - Shales -
CUT LIP HILL SECTION
SYMBOLS
bedding
cleavage
jointing
joints with quartz veins
sub-outcrop
Legal Corner Post for Mineral Claims
Apparent limit of transition to porcellanite in shales and silty rocks, or to hornfels in more quartz-rich clastic rocks.
Apparent limit of complete transition of all rocks except quartzite to porcellanite.
7252
Scale 1:5,000
Contour interval 60 m
G.R. Peatfield 30/04/79
Figure 4 N
Texasgulf Inc.
BOYA CLAIMS
GEOLOGY - NORTH SHEET
NTS 94M, 3W, 4E, 5E, 6W
Proj. 62
WORK BY G.R.P., C.R.
DRAWN BY E.R.
DATE December, 1978
DRW,G NO.
Scale in Metres

"Moose Hill"
"Main Face"
"South Pond"
"Hawk Pad"
See Figure 6 for detail in this area
L.C.P.
L.C.P. (Fr)
584,000 E
585,000 E
586,000 E
587,000 E
6,567,000 N
6,566,000 N
6,565,000 N
6,564,000 N
BOYA 1
BOYA 2
BOYA 3
BOYA 4
BOYA 5
BOYA 6
BOYA 7
BOYA 8
BB1 (Fr)
Outline of Figure 4S
SCALE 1 : 50,000
LEGEND
INTRUSIVE ROCKS
7c Quartz - feldspar porphyry dykes.
7b Quartz porphyry, aplite.
7a Quartz - biotite - feldspar porphyry.
METAMORPHIC ROCKS (WITHIN THE THERMAL AUREOLE OF UNITS 7a-c)
D 'Porcellanite' - fine, banded siliceous skarn, alternating layers of quartz and diopside.
C Coarse diopside - quartz skarn, often with appreciable pyrrhotite.
B Coarse garnet skarn.
A Hornfels.
note: Marbles are not mapped separately, but are included with unit 5 below.
UNMETAMORPHOSED SEDIMENTARY STRATA
MAIN FACE SECTION
(see Figure 5 for detailed column)
5 a Massive limestone; a: thin-bedded limestone, sandy limestone.
4 a Dark shale; a: massive white-weathering limestone.
3 'Volcanic unit' - flows, breccias, tuffs, tuffaceous shales, chert.
2c Thinly interbedded limestone and limey shale.
2b Thinly banded shale, limey shale, siliceous shale, fine sandstone.
2a Quartzite (seen only in the metamorphic zone).
note: units 2a - c are intercalated.
NORTHWEST AREA SECTION
6 Dark shale.
5 Massive limestone and marble.
4b Shale, sandy shale, fine sandstone.
correlation uncertain
HAWK PAD SECTION
1d Grit, pebble conglomerate.
1c - Dolomite -
1b - Limestone -
1a - Shales -
CUT LIP HILL SECTION
SYMBOLS
bedding
cleavage
jointing
joints with quartz veins
sub-outcrop
Legal Corner Post for Mineral Claims
Apparent limit of transition to porcellanite in shales and silty rocks, or to hornfels in more quartz-rich clastic rocks.
Apparent limit of complete transition of all rocks except quartzite to porcellanite.
7252
Scale 1:5,000
Contour interval 60 m
G.R. Peatfield 30/04/79
Texasgulf Inc.
BOYA CLAIMS
GEOLOGY - SOUTH SHEET
NTS 94M/3W, 4E
Proj. 62
WORK BY G.R.P., C.R.
DRAWN BY E.R.
DATE December 1978
DRW,G NO.
100 0 100 200 300 400
Scale In Metres

Figure 4S

583,000 E
584,000 E
585,000 E
586,000 E
587,000 E
6,569,000 N
6,568,000 N
6,567,000 N
BOYA 1
BOYA 2
BOYA 3
BOYA 4
BOYA 5
BOYA 6
BOYA 7
BOYA 8
LCP
SCALE 1 : 50,000
Contour intervals:
1 - 25
26 - 50
51 - 100
101 - 200
201 - 400
401+
Number of samples
Value interval (ppm)
LEGEND
All sample numbers on report sheets are of the form 62 - # - 78
Cut line traverse
Chain and compass traverse
Chained contour traverse
7252
G.R. Peatfield. 30/04/79
Scale 1 : 5,000
Contour interval 60 m
Figure 7d
Texasgulf Inc.
BOYA CLAIMS
SOIL GEOCHEMISTRY
Cu in soils (ppm)
NTS 94M/3W, 4E, 5E, 6W
Proj. 62
WORK BY
G.R.P.
DRAWN BY
E.R.
DATE
SEPT. 1978
DRW,G NO.
Scale in Metres


583,000 E
584,000 E
585,000 E
586,000 E
587,000 E
6,569,000 N
6,568,000 N
6,567,000 N
865
805
925
985
1045
745
BOYA 1
BOYA 2
BOYA 3
BOYA 4
BOYA 5
BOYA 6
BOYA 7
BOYA 8
LCP
BOYA Ck
SCALE 1 : 50,000
Contour intervals:
1 - 100
101 - 200
201 - 400
401 - 800
801 - 1600
1600 +
Number of samples
Value interval (ppm)
LEGEND
All sample numbers on report sheets are of the form 62 - # - 78
Cut line traverse
Chain and compass traverse
Chained contour traverse
7252
G.R. Peatfield
30/04/79
Scale 1:5,000
Contour interval 60 m
Figure 7e
Texasgulf Inc.
BOYA CLAIMS
SOIL GEOCHEMISTRY
Zn in soils (ppm)
NTS 94M/3W, 4E, 5E, 6W
Proj. 62
WORK BY
DRAWN BY
DATE
DRW'G NO
G.R.P.
E.R.
SEPT. 1978
Scale in Metres


583,000 E
584,000 E
585,000 E
586,000 E
587,000 E
6,569,000 N
6,568,000 N
6,567,000 N
865
805
925
985
1045
745
BOYA 1
BOYA 2
BOYA 3
BOYA 4
BOYA 5
BOYA 6
BOYA 7
BOYA 8
LCP
Contour intervals
1 - 2
3 - 5
6 - 10
11 - 20
21 - 40
41+
Number of samples
Value interval (ppm)
LEGEND
All sample numbers on report sheets are of the form 62 - # - 78
Cut line traverse
Chain and compass traverse
Chained contour traverse
7252
G.R. Peatfield 30/04/79
Scale 1:5,000
Contour interval 60 m
Figure 7f
Texasgulf Inc.
BOYA CLAIMS
SOIL GEOCHEMISTRY
Bi in soils (ppm)
NTS 94M/3W, 4E, 5E, 6W
Proj. 62
WORK BY G.R.P.
DRAWN BY E.R.
DATE SEPT. 1978
DRW,G NO.
Scale in Metres