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RICHARDSON RIVER EXPLORATION PERMIT
NORTHEAST ALBERTA

by

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3 September 1995

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FRONTICEPIECE

Richardson River, looking east from north end of grid

Geological REPORT on PRECIOUS METALS in NORTHEAST ALBERTA

Permit Number

9392080043

EXECUTIVE SUMMARY

Albitized bleached potassic gneisses are host to scattered blebs of oxide after sulphide, which appear spatially and genetically related to northeast trending faults which are manifest as weak mobile element soil geochemical highs and very strong total field magnetic anomalies. These require detailed examination, probably by drilling.

Work done comprised air photo interpretation, geological mapping of 4 km^2, airborne reconnaissance over 8km^2, ground based magnetometer reconnaissance over 7 km^2, detailed magnetometer and soil geochemistry on 2 small grids, and detailed mapping of a third. Hard rock multielement chemical analyses was done on 63 samples.

Apart from claim and permit acquisition costs of $ 450.00, a total of $55,648.11 has been spent in work on this property.

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1 Introduction

One mineral exploration permit, totalling 9216 Ha, being all of Township 103 Range 5 West of 4th Meridian has been staked in northeast Alberta. The permit straddles the Richardson River, 15km upstream of the river crossing of the Fort MacMurray-Fort Chipewyan winter road, 80km south of the western reaches of Lake Athabasca and 35km east of Point Brule and Chipewyan Indian Reservation 201G on the Athabasca River (location map fig 1).

The permit was filed and registered on 6 August 1992 as Metallic Minerals Exploration Permit 6892080043. Anniversary date is 6 August 1995, when renewal or downsizing is mandatory. Permit outline and topographic features are shown on fig 2.

2 Geology

The regional geological map shows the area is underlain by Archaean gneisses. Ice flow was from northeast towards southwest. The area is a moderately flat plain cut by the Richardson River which runs from southeast to northwest in a shallow incised meander, some 50 ft (15m) deep. Rock outcrops are scattered, with glacial deposits covering large areas.

3 Basis for the staking.

The area was reconnoitred in September 1992, and again in February and examined on the ground in October 1993, after the area was staked. There were several reasons for this staking, many of them deductive and circumstantial. Most compelling was a spectacular "bullseye" aeromagnetic anomaly confined to a single flight line, coinciding with a disruption of the regional gneissic banding, and marking a sharp change in course og the Richardson River, from due west to due north. This feature coincides with a northeast trending photolinear, interpreted as the manifestation of a fault. Old regional maps show the "Rudy Martin" fault trending southwestwards from this point.

3.1 Aeromagnetism.

With flight lines at 800m intervals, and flight elevation of 300m above relatively level terrain (topography variance of <100ft), the area has good aeromagnetic coverage, albeit unsuited to the small targets envisaged. In general the regional magnetic response is subdued (fig 2), but of interest are:

3.1.1 A strong "bullseye" feature, covering an ellipse of some 600 hectares area, with a magnitude of 120nT over general background of 60000nT, is centred in the western half of the permit. The feature is confined to one flight line, with very little response in the two lines to the south, and none to the north.

3.1.2 A weak extension of this "bullseye" in the two lines immediately south of the main feature, giving a suggestion of south striking linearity.

3.1.3 A moderate magnetic high, of some 60nT above background, covering an irregular area of 600 hectares to the southeast of the principal anomaly.

4 Work Done

4.1 Aerial photo features

Aerial Photographs series 1950 A 12937 run 160-5716-1831 photographs 08, 09, 10 and 11 (1:40000 scale) were examined at the University of Calgary Library. Several features are notable:

4.1.1 Strong gneissic banding, showing isoclinal folding, strikes along a consistent 340° trend over the entire area. Dip is steep, probably vertical, perhaps towards the southwest.

4.1.2 Sharp disruption of this band lies within the focus of the principal aeromagnetic high. A conjugate joint set striking 280° and 030° coincides with this disruption.

4.1.3 Moderate disruption of the gneissic banding towards the south of the principal aeromagnetic high. A joint set striking 250° coincides with this disruption.

Four ring features, in which all vestiges of gneissic banding have been eliminated were observed:.

4.1.4 A large ring feature, some 100 hectares in area, is centred within the northern disruption.

4.1.5 A small ring feature, some 7 hectares in area, is centred on the east bank of the Richardson River, immediately northeast of the northern disruption. This might be an old river terrace on a meander.

4.1.6 A small ring feature, some 12 hectares in area, is centred on the west bank of the Richardson River, immediately southeast of the northern disruption. This might be an old river terrace on a meander, but the feature requires investigation.

4.1.7 A large ring feature, some 150 hectares in area, is centred within the southern disruption. Jointing of the 30° direction of the northern disruption set, and a suggestion of gneissic banding can be seen in the centre of this feature, but not about the edges of it.

4.2 Aerial Reconnaissance

Preparatory to making a field visit to the area, and in an attempt to locate and verify certain of the features located by the preliminary office work, the area was extensively overflown in September 1993 in a light aircraft, taking video footage and oblique photographs. This was supplemented by road reconnaissance conducted along the winter road as far as the river crossing in the fall of 1992, and again towards the end of that same winter (February 1993). The information so collected proved invaluable in forward planning for access and timing of the initial exploratory reconnaissance work. This was further supplemented with more intensive overflights immediately prior to starting the first exploratory ground work in the area.

The Richardson River is navigable from the Winter road crossing, using either a jet boat or the like in summer/fall, or a skidoo/snowmobile in winter or spring. Several of the larger lakes lend themselves well to float plane ingress and egress in summer/fall, and will be adequate landing sites in winter/spring.

4.3 Field Work

Preliminary exploration was done between 9 and 16 September 1993, using a float plane out of Fort MacMurray for access. On this first trip, work was confined to the central south, aimed at familiarization with the area; using reconnaissance magnetometer and geological traverses in the first two man days, thereafter concentrating on magnetometer and geochemical soil sampling surveys over a detailed grid over an area of particular interest (Whiterock North) north of the Airstrip Lake, west of Long Lake.

The second trip, undertaken between 27 July and 1 August 1994, extended the reconnaissance in the south, with a small pitting exercise on the linear magnetic and soil geochemical anomaly located in the Whiterock area, and a geological and hard rock geochemical sampling exercise to the west of here.

An exciting gold assay, of 1.3g/t, from a grab sample of amphibolite, taken during this trip, instigated a one day (20 September 1994) helicopter borne trip by two geologists and a field technician from Birch Mountain Minerals, who took nine bulk rock samples, and completed a quick field reconnaissance in the Mount Walter area, where the gold in amphibolite was reported.

The fourth field visit was made from 29 September 1994 to 4 October 1994, when mapping of the Mount Walter area was completed, together with further rock geochemistry, and an experimental 4 sample geochemical soil survey. The extent of the mapping, and reconnaissance on the ground and from the air is depicted on fig 3.

4.3.1 Geological Mapping

In the Whiterock area, with the limited and scattered outcrop, a detailed geological map is not practical. However, mapping has shown that an older pink potassic feldspar-quartz-biotite gneiss is the dominant rock type. Pegmatites, aplite dykes and rarer bull quartz and quartz-feldspar veins intrude the gneiss.

Of particular interest are bleached albitized and serucitized zones in the pink gneiss, where the foliated fabric is retained, and where scattered blebs of oxide after sulphide appear to be an inticate part of this albitization process. These bleached zones seem to be related to shearing along a northeasternly trend, reflected in a very strong magnetic and VLF-EM signal. With the limited readings possible, there is no indication of preferred orientation of gneissic foliation. Results are shown on the map (figs 4,5 and 6).

Further west, and to the south of Whiterock, outcrop is more extensive, and geological mapping was more practical to undertake.

The area is wholly underlain by migmatitic gneisses. A spectacular granitized "stoping" breccia occupies the northern slope of a knoll to the northeast of Mount Walter, but in general the relationship between rock types is more subtle and complex.

The orange and pink potassic gneisses, pegmatites, leucogneisses and local mylonites commonly have smooth surfaces, and rarer moss and lichen cover than the less coarsely crystalline pink to grey granitic gneisses. These show increasing mafic content and a concommitent increase in iron staining on fractures. They are locally porphyritic, and appear to be a better host to moss and lichen colonization.

A dark, foliated amphibolite occurs as streaks and commonly as large platy to rod shaped imbricated xenoliths in the pink gneisses, which grade locally from adamellites and granodiorites through dark metagabbroic gneisses to this amphibolite. There are signs of partial melting, and autometasomatism throughout. Of particular interest are the iron stained flecks and joints which occur, but which seldom seem related to sulphides.

The amphibolite forms a complex rock type of "zebra-ite", a field term coined to describe migmatite comprising repeated thin amphibolite bands intercalated with orange to pink and white leucogneiss to form a characteristic zebra striping. This is most common at the edge of a shallow valley southwest of the peak of Mount Walter.

Vein intrusions of 3 types were noted.

Particularly common are potassic feldspar pegmatites, which seem to invade all rock types without prejudice.

Several aplite veins, which appear to predate the potassic mineralization, intrude the granitic rocks, but were not observed in contact with more mafic lithologies.

Veins of cloudy to translucent, irregularly oriented quartz measuring a few millimetres to several decimetres across, and seldom extending more than a few metres laterally at the most, are common in fractured area, and are particularly concentrated in and around pegmatitic zones. One such vein to the north and east of Long Lake, returned 180 ppb Au.

No detailed structural study was undertaken. A distinct linearity of topographic features (130-140°) such as ridges and gulleys is noticeable, and glacial striaa tend to follow this trend.

4.3.2 Ground Magnetometery Survey

4.3.2.1 Reconnaissance

Three exploratory traverses were undertaken with a back mounted magnetometer. The work entailed pace and compass-line free-traversing, taking total field readings every 5 to 30 metres, depending on the degree of change in readings. Occasional backtracking was necessitated where interesting changes were noted. Tie-in of the traverses were done on aerial photographs, copies of the 1:50,000 topocadestral sheet, blown up to 1:25,000, and with a hand held Global Positioning System. Figs 3 and 8 depict the locations of these reconnaissance traverses.

4.3.2.2 Detailed

Two areas were singled out for immediate, more detailed work.

4.3.2.2.1 Richandson River

A grid, 200m east to west and 120m north to south was laid out on the knoll which appeared to coincide with the main aeromagnetic bullseye immediately east of the Richardsons River (fig 9). Readings were taken at 10m intervals. The results are inconclusive (figs 10-15), showing that there is indeed a strong signal in the area, but the grid requires to be extended towards the west and north.

4.3.2.2.2 Whiterock North

The first reconnaissance traverse north from Airstrip lake showed a sharp anomaly some distance north of Whiterock. This was repeated at Eastkick in the traverse to the east of Long lake, and again on the return traverse. Accordingly, in the area north of Whiterock, a grid was laid out over some 140m north to south, with north-south lines run every 20m, flagged at 10 m intervals (fig 30). Figs 19-29 depict the north-south magnetic profiles in this grid area, fig 30 is a synoptic plan.

4.3.3 Ground VLF-EM Survey

Three confirmatory VLF-EM traverses were run over the core of the magnetometer grid. Results are depicted in figs 16-18.

4.4 Pilot Soil Geochemical Survey

As an addendum to the geophysical survey on the Whiterock grid, a total of 54 sediment samples were collected from the zone immediately beneath the humus on several of the lines. These were analysed for As, Co, Cu, Fe, Pb, Mn, Mo, Ni, Ag, Zn. Results are depicted on the attached plans, figs 31 to 40. There is a subtle ridge of higher values trending northeast to southwest trend in most of these elements in the soil samples; a trend which reflects also the alignment of the ground-borne magnetometer anomaly.

Pitting in the sands beneath the muskeg was not a success, but 3 samples were collected beneath sample point 80E 80S at depths down to 1.5m beneath ground level. An increase in gold values in the soil from 2 ppb to 13 ppb occurs from surface to base of pit. This is not statistically significant, as it is only three samples, representing one point sample station.

A further 4 soil samples (MM-4, MM-5, MM-6, MM-7) were collected on Mitch Mountain, on the fourth trip, to investigate the potential mineralization of a gulley which could be an extention of the magnetic linear in the Whiterock grid. High chromium values characterize this suite, which probably reflects the proximity of the amphibolites, but which seems to have no exciting economic significance.

4.4.1 Rock Geochemical Survey

One sample of vein quartz from within the potassic gneisses east of Long Lake returned a value of 184ppb Au in NAA analysis, confirmed in fire assay at 107ppb Au (sample 60E80S). This is significant in that it confirms that there is gold, and the mechanism for concentration, in the area, but it is not in itself interesting, as it occurs in an environment where enhanced gold values are expected to occur (late vein quartz in metasedimentary migmatites).

In the three follow-up geochemical sampling exercises, a total of 9 bulk samples ($^{+}/_{-}$5kg ea.) were submitted for gold and silver by fire assay, and 49 samples submitted for multi-element neutron activation analysis.

The single gold value (1330ppb Au in sample 20A) from an amphibolitized mafic xenolith or sedimentary layer in the migmatitic gneisses on Mount Walter is a problem. The initial assay was by NAA, with a confirmatory fire assay (640ppb Au) on the pulp from the same sample. There is little doubt that the value is real, and not an artifact of poor or questionable assay technique. However, repeated sampling by Birch Mountain Minerals staff over the same rock type in the same area was unable to duplicate the result (samples 0313 - 0321), and resubmission of the retained hand specimen of the original sample showed no gold present (assays on workorder 9366D-94, CanTech Laboratories Inc. 94-11-15).

Significant is the analysis of the sample of bleached "whiterock" (on workorder 9232D-94, CanTech Laboratories Inc. 94-03-14), in which sharply enhanced arsenic and lead and zinc values, despite low iron content, suggest that this is proximal to a zone of higher base metal / precious metal content. Certainly this analysis, together with the observation of disseminated sulphide rich blebs in this lithotype, supports the view that this bleached granitic rock, where close to the geochemical and geophysical linear anomaly, is a worthwhile exploration target.

5 Discussion

Uncorroborated evidence in recent press releases from junior exploration companies (Focal Resources, NSR, Tintina Mines, Birch Mountain Minerals) indicate that significant precious metal values are being recorded in the immediately overlying Devonian carbonates and arenites around Fort MacKay, which is on strike of the Rudi Martin Fault, some 40km to the southwest. There are good reasons to believe that their findings are real, and that the gold values they have returned are appreciable. Certainly, gold grains have been recorded in rocks in the area in scanning electron microscope work done by the ISPG - GSC in Calgary. Evidence suggests that the gold mineralization is related to the faulting, to the carbonates, and to the presence or proximity of hydrocarbons.

Although only basement rocks were observed in the field traversing, it is conceivable that isolated remnants of Devonian rocks may occur beneath the glacial cover. In turn, these may have elevated economic mineral values, associated with sulphide mineralization, immediately beneath the base of the Cretaceous. The difficulty lies in searching for such an elusive target, and this avenue has not been pursued.

Recent mapping by the GSC in the Margarite River area, some 20km to the south, shows enhanced geochemical responses associated with strong mylonitization and cryptocrystalline- to amorphous-silica/chert along intensely sheared faults which trend northeast in the gneisses. Sulphide mineralization of such a fault zone would give a magnetic and VLF-EM response similar to that recorded here. This thesis is supported by albitization of the gneiss close to the presumed fault north of Whiterock, and more particularly by the scattered sulphides in the albitized gneisses.

That a significant coincident geophysical and geochemical anomaly exists in the Whiterock north and Eastkick areas is undeniable. What this anomaly represents is a conundrum, and will be the focus of further work, probably in the form of trenching and diamond drilling.

6 Conclusions and Recommendations

6.1 The single gold value returned from the quartz vein suggests that there is a mechanism for gold emplacemnt and enrichment in these migmatites, but is not in itself of significance;

6.2 The single gold value returned from the amphibolites was unfortunate in that it diverted effort into a wild goose chase in studying these amphibolites in considerable detail, to the detriment of examination of the bleached granitic rocks, which seem to have rather more promise;

6.3 There are interesting trace elements returned from the iron stained, sulphide flecked, leucogranitic "whiterock", which appears to be an albitized facies of potassic gneisses. The albitization, and the sulphide blebs, appear to be cogeneric, related to possible mineralization of northeast trending faulting, which has a strong geophysical and geochemical signature;

6.4 The ground magnetometer profile suggests that this fault is a near-vertical plane, with thickness of sulphide mineralization (if it exists) of less than 10m, penetrating to within a few metres of surface;

6.5 This fault, and the apparently associated "whiterock" are primary targets for further trenching and possibly diamond drilling work.

7 Expenditure

Physical expenditure on these permits was largely incurred in access to the area, using chartered flights out of Fort McMurray, and in road travel from Calgary to Fort McMurray. Assay and technical equipment costs add to this. The balance claimed is largely in the form of unpaid labour; professional, technical and manual, both field and base.

Claimed expenditure is detailed on a separate schedule.

8 Certification

I, Adrian Gardiner MANN, undersigned, certify that:

8.1 I am a graduate of the Universities of London, England and Witwatersrand, South Africa;

8.2 I hold the degrees of:
Ph.D.,
M.B.A.,
B.Sc. (General Honours) in chemistry and geology,
B.Sc. (Special Geology)(Honours);

8.3 I am a member in good standing of:
Society of Economic Geologists,
Geological Society of South Africa,
Institution of Mining and Metallurgy,
Canadian Institute of Mining, Metallurgy and Petroleum;

8.4 I am registered:
in Alberta as a Professional Geologist,
in Britain as a Chartered Engineer;

8.5 I have practised continuously as a geologist since first I graduated in 1965. My experience was gained in central and southern Africa, south and north America;

8.6 The work presented in this report is a fair and honest reflection of the geology of the claim area;

8.7 The data on which opinions expressed in this report are made derive from:

8.7.1 Field reports by technicians and two other geologist in August, September and October 1994.

8.7.2 Personal visits in September 1993 and 1994, when the property was sketch mapped, soil- and spot-sampled, and when geophysical surveys were undertaken;

8.8 I have a direct one third interest in the property.

Adrian G. Mann Ph.D., P.Geol.,
10443 Brackenridge Road S.W.,
Calgary, Alberta T2W 1A1.
3 September 1995

FIGURES

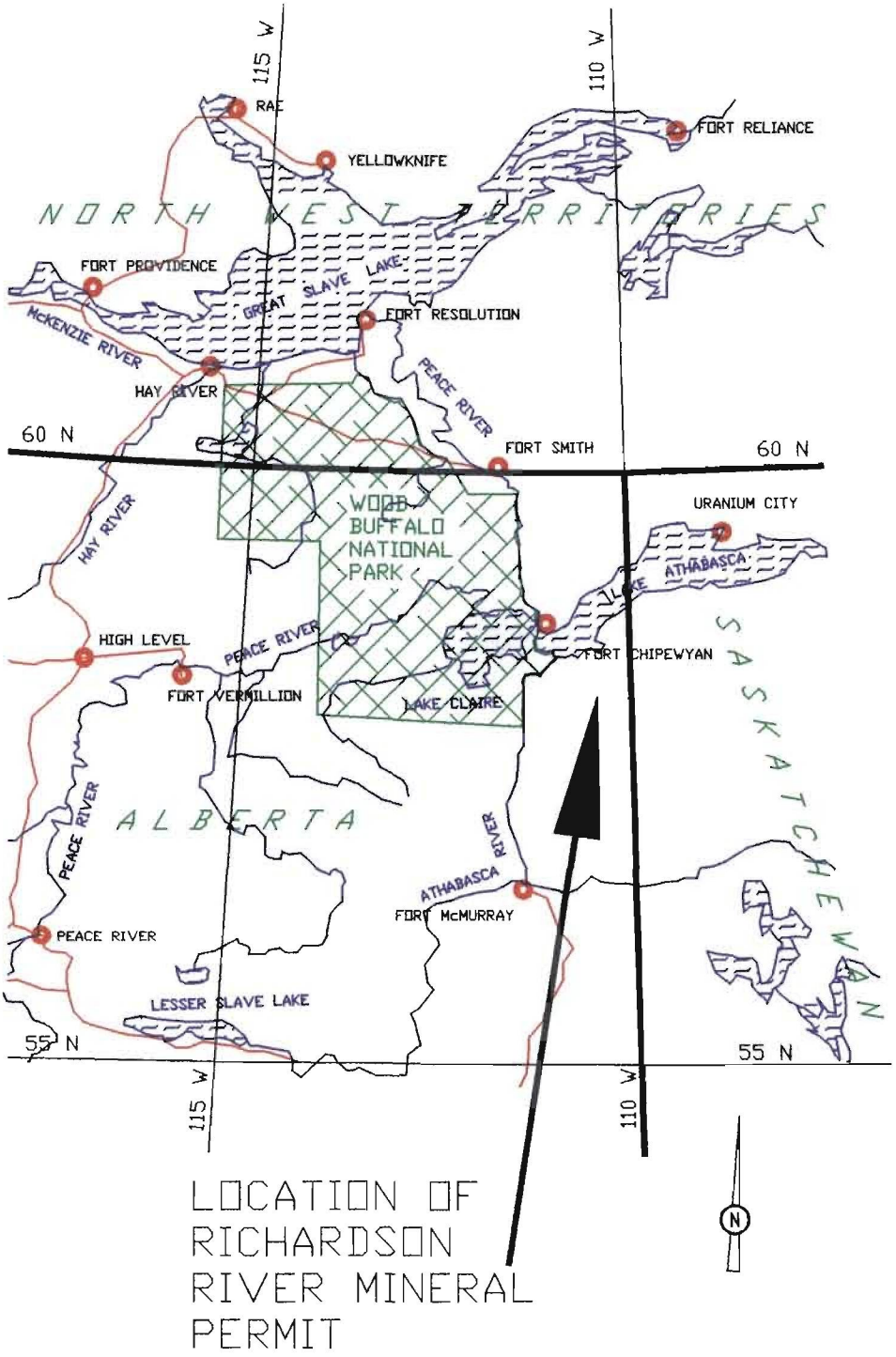
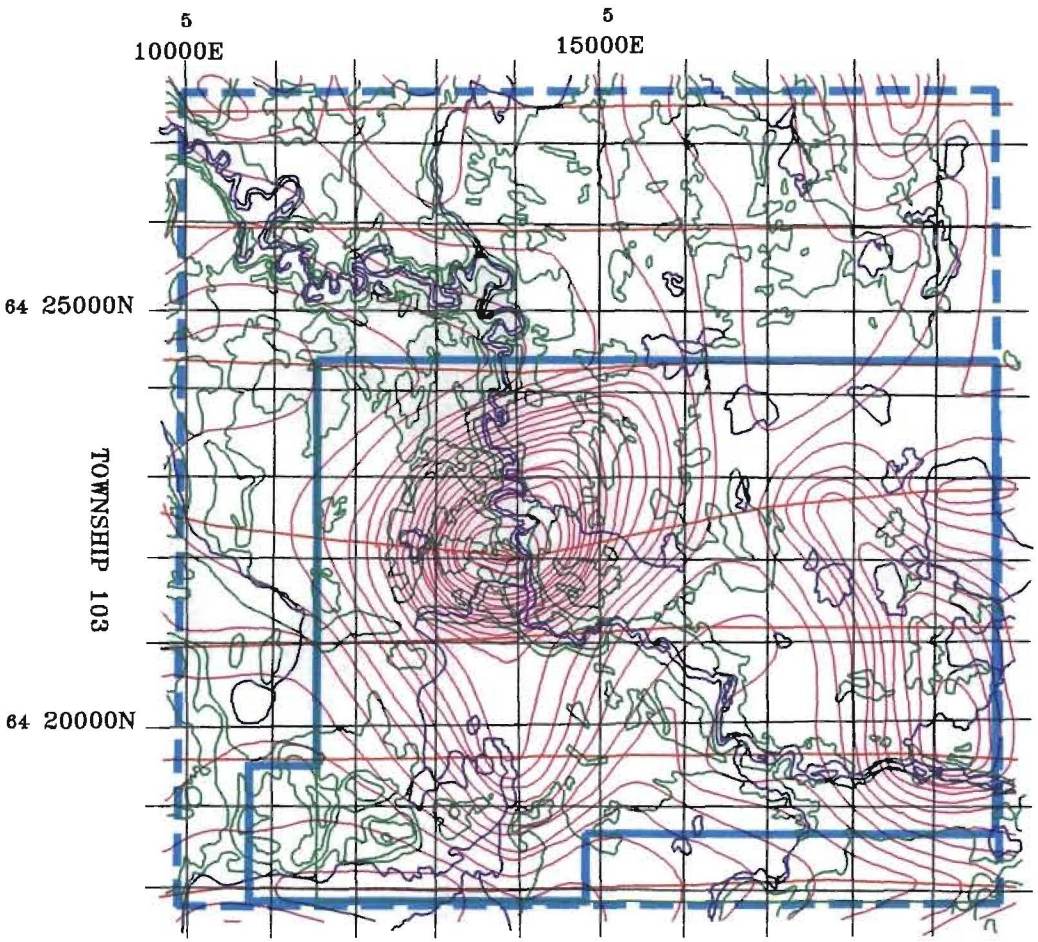

115 W
110 W
RAE
YELLOWKNIFE
FORT RELIANCE
NORTH WEST TERRITORIES
FORT PROVIDENCE
GREAT SLAVE LAKE
FORT RESOLUTION
McKENZIE RIVER
HAY RIVER
PEACE RIVER
60 N
FORT SMITH
WOOD BUFFALO NATIONAL PARK
URANIUM CITY
ATHABASCA
HIGH LEVEL
FORT CHIPEWYAN
FORT VERMILLION
LAKE CLAIRE
SASKATCHEWAN
ALBERTA
ATHABASCA RIVER
FORT McMURRAY
PEACE RIVER
LESSER SLAVE LAKE
55 N
LOCATION OF RICHARDSON RIVER MINERAL PERMIT
N

Figure 1

Figure 2 Rev. 1



EXPLANATION:

- 20 nT AEROMAG CONTOUR
- 10 metre SURFACE CONTOUR
- RIVER
- FLIGHT LINE
- ORIGINAL PERMIT BOUNDARY
- PROPOSED NEW PERMIT
- UTMG 1 km GRID LINE

SCALE

0 1 2 3 4 Km

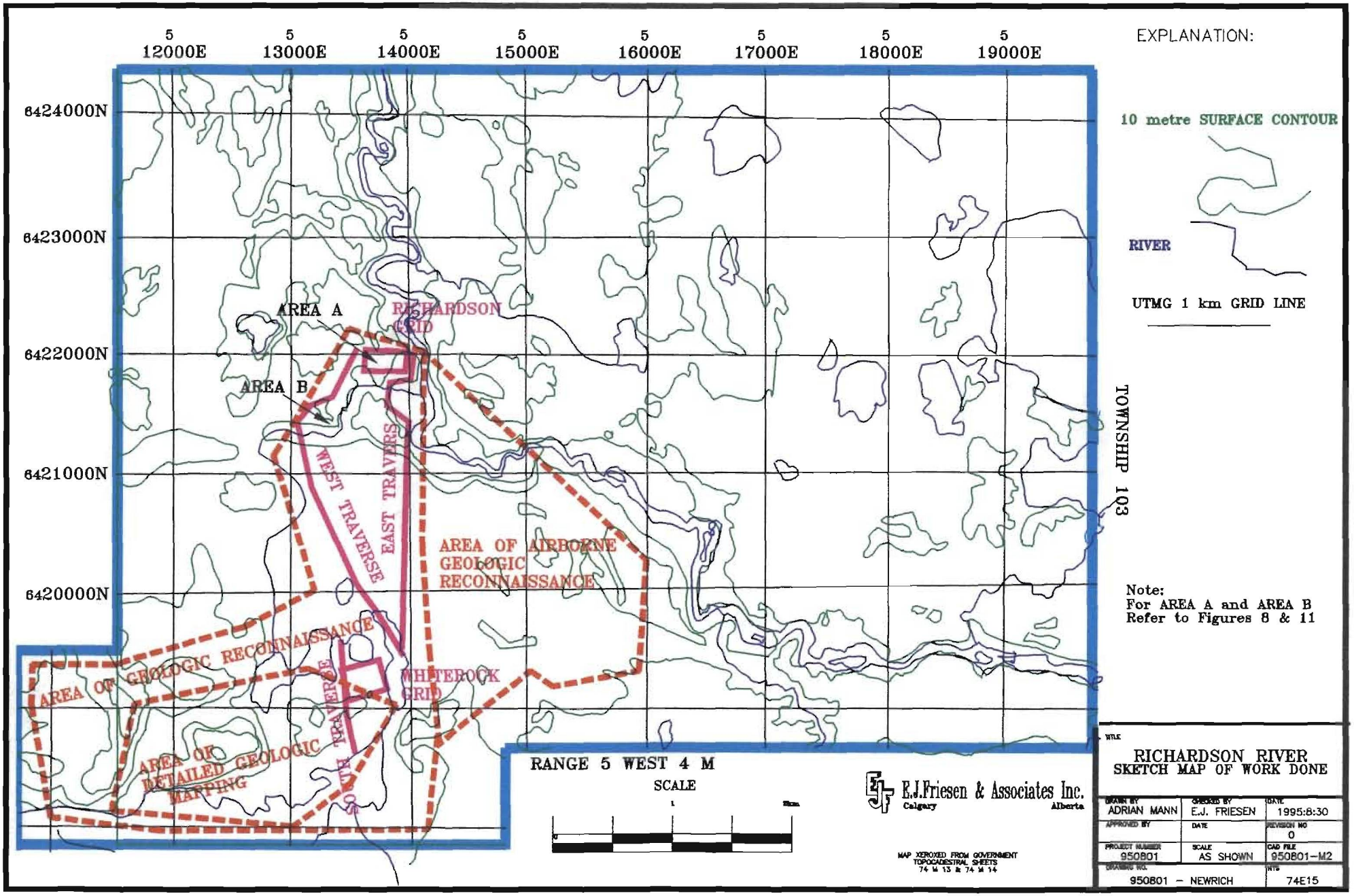
E.J.Friesen & Associates Inc.
Calgary Alberta

MAP XEROXED FROM GOVERNMENT TOPOCADESTRAL SHEETS 74 M 13 & 74 M 14

TITLE
RICHARDSON RIVER
AEROMAGNETIC BASE MAP

DRAWN BY: ADRIAN MANN	CHECKED BY: E.J. FRIESEN	DATE: 1995:8:30
APPROVED BY:	DATE:	REVISION NO: 0
PROJECT NUMBER: 950801	SCALE: AS SHOWN	CAD FILE: 950801-M1
DRAWING NO.: 950801 - RICHMAG		NTS: 74E15

Figure 3 Rev. 1



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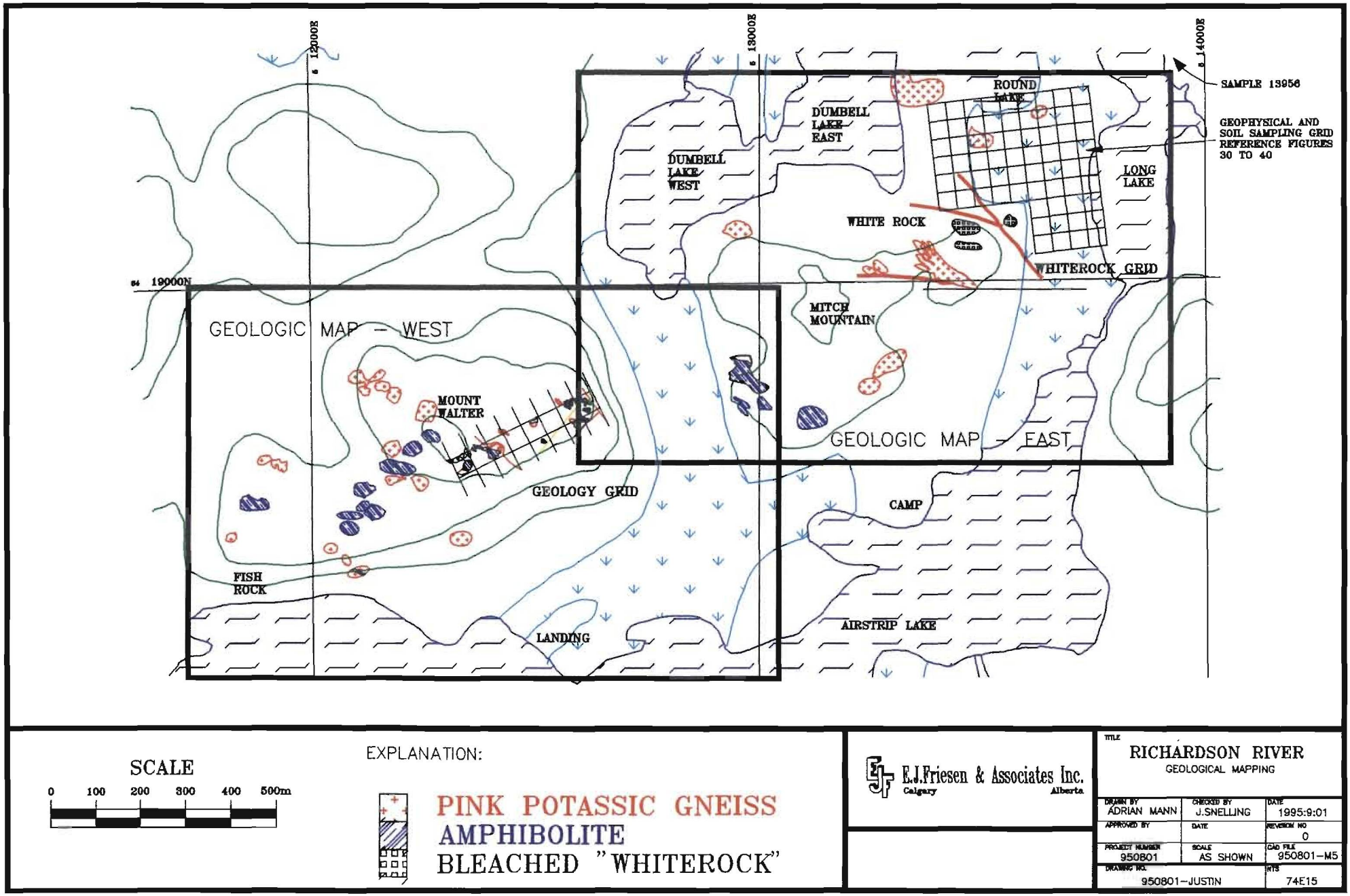

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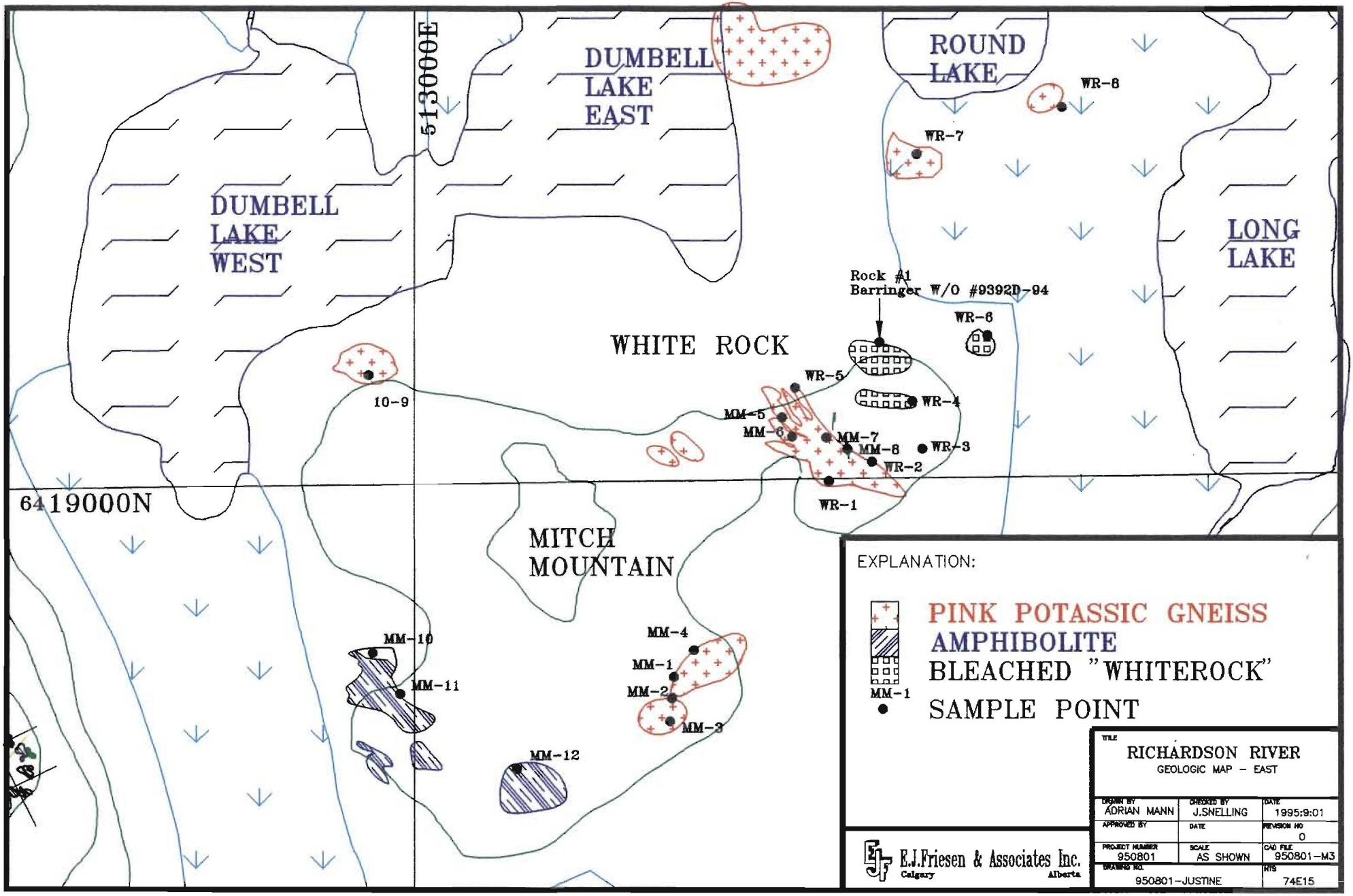

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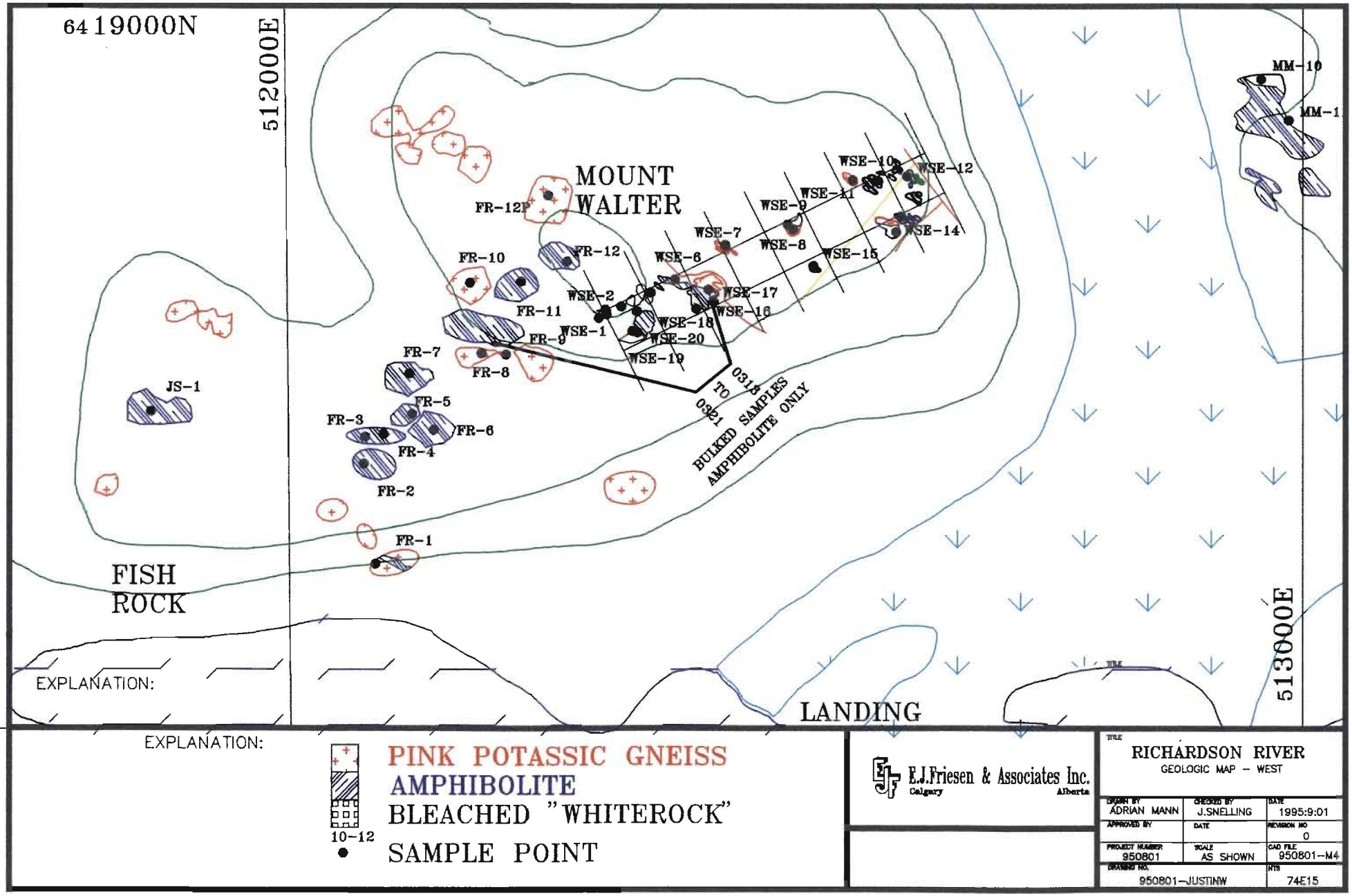

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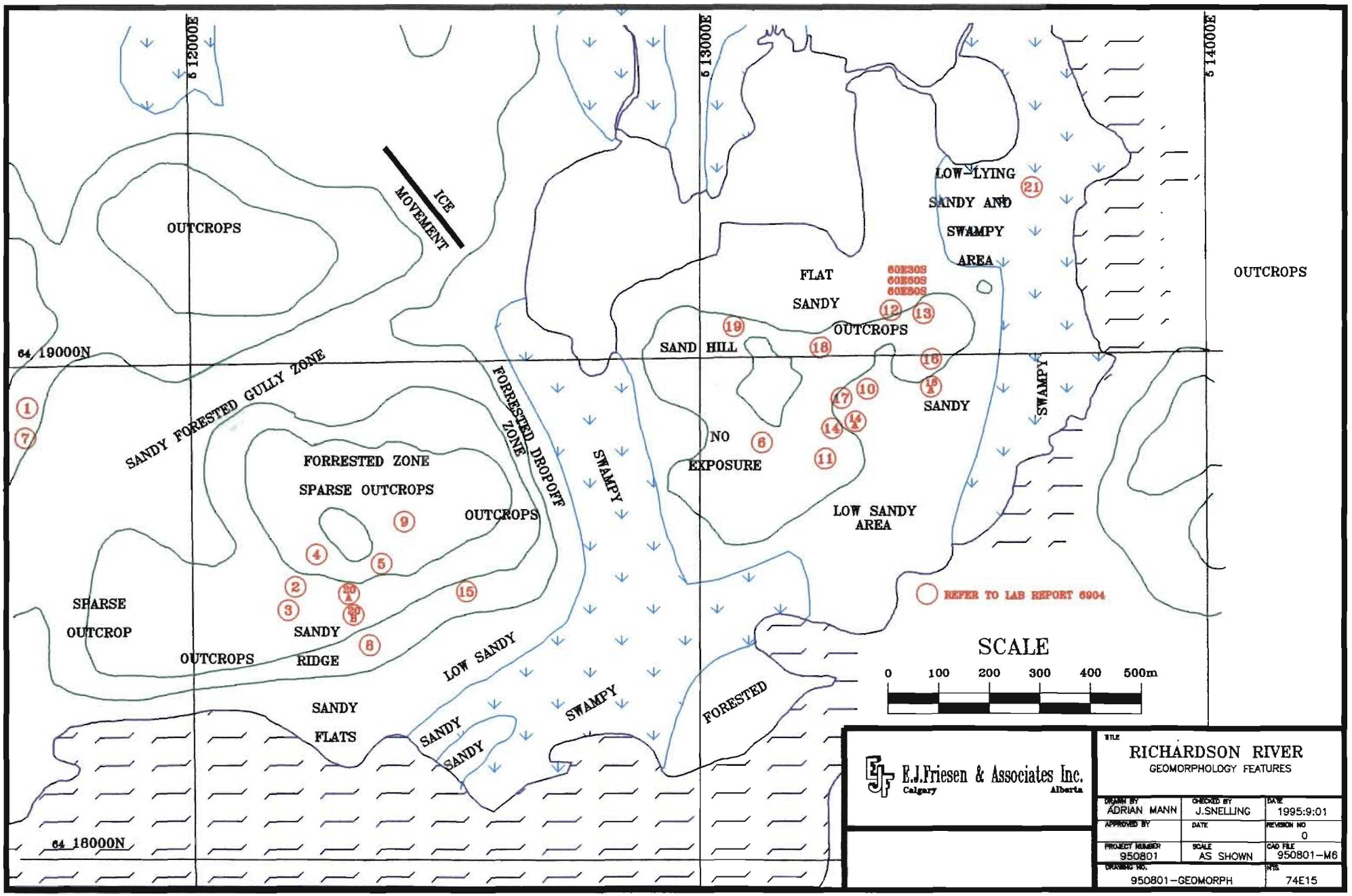
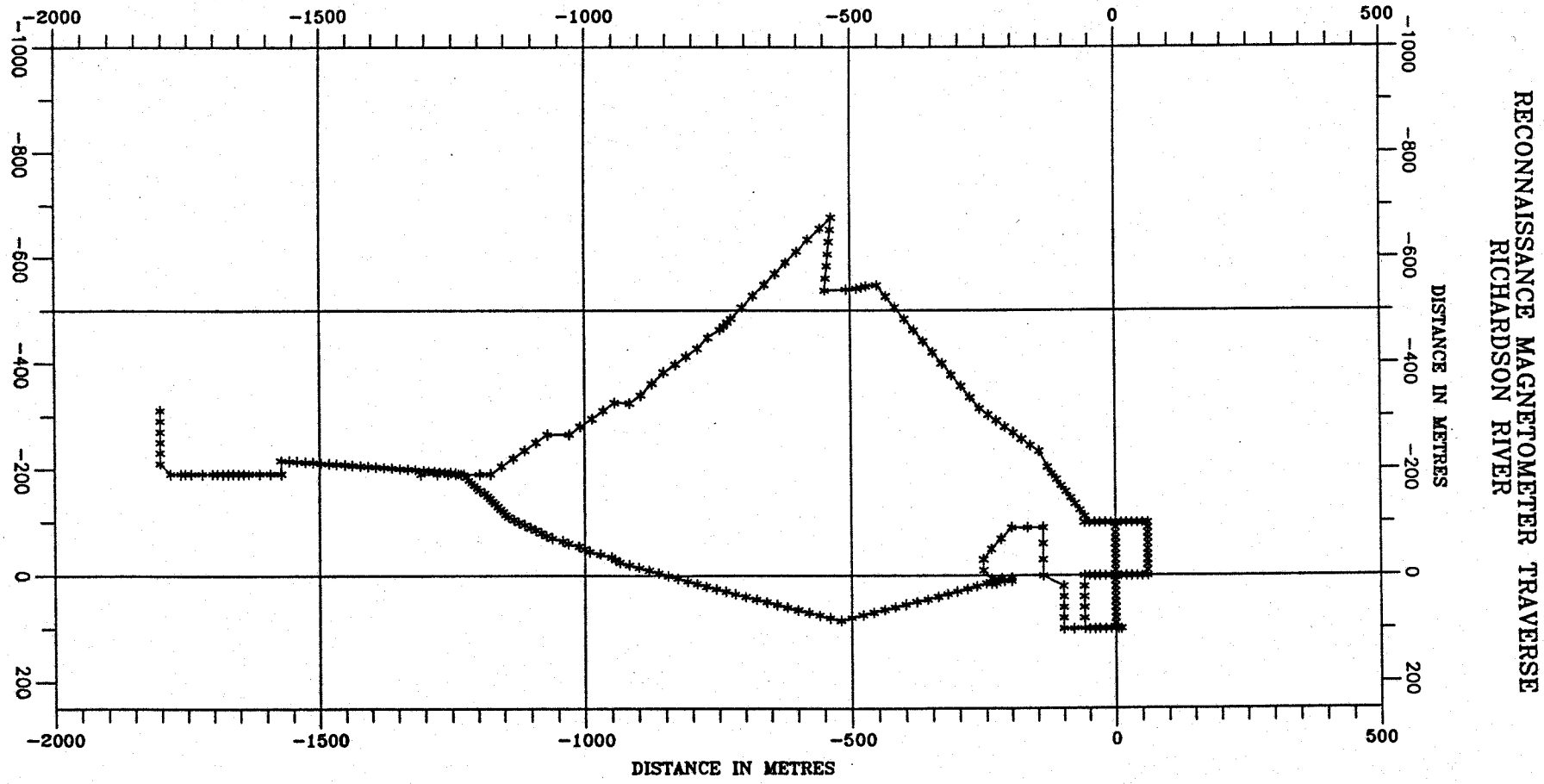


Figure 8 Rev 1

Note: For Grid Reference, refer to Figure 3 Rev. 1 " AREA B "



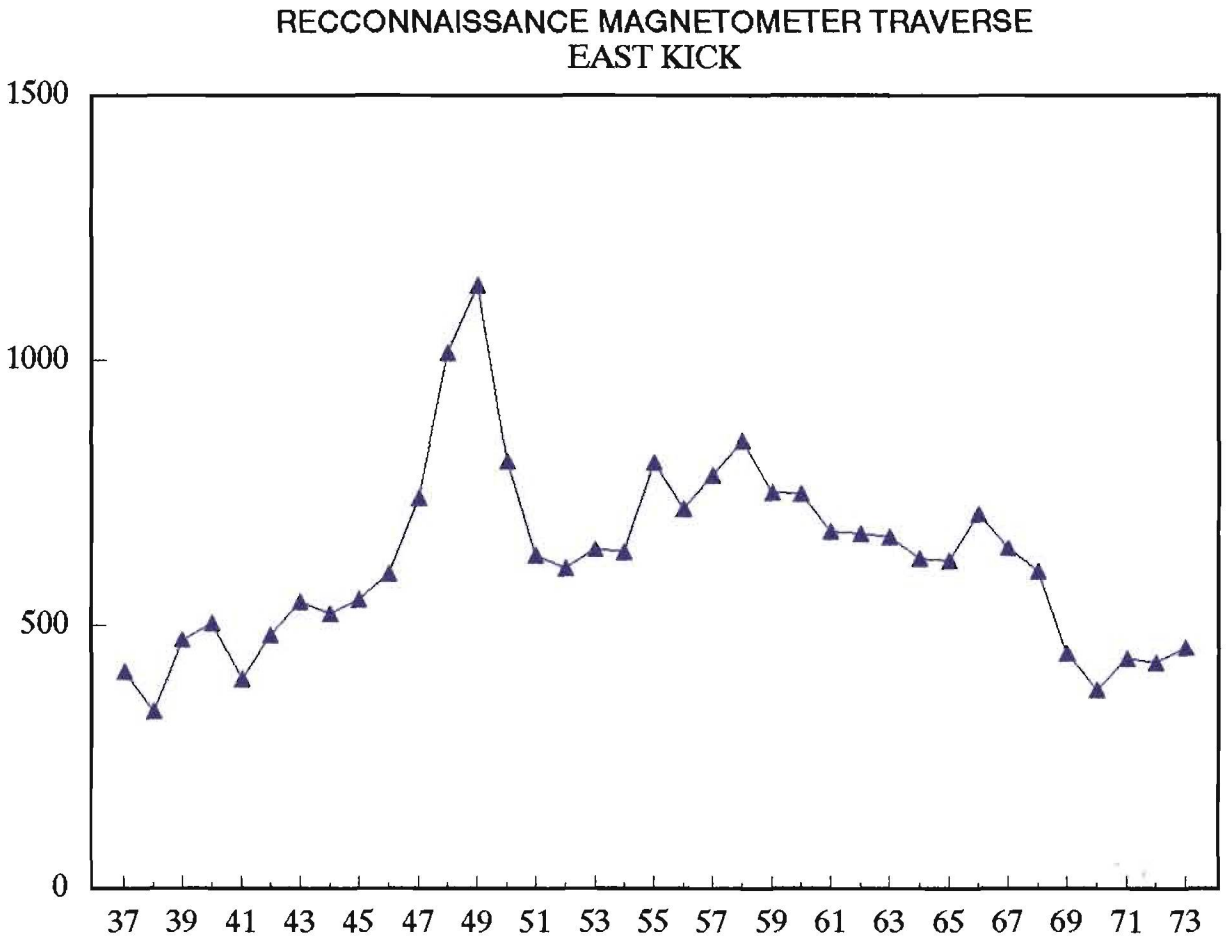

RECCONNAISSANCE MAGNETOMETER TRAVERSE
EAST KICK
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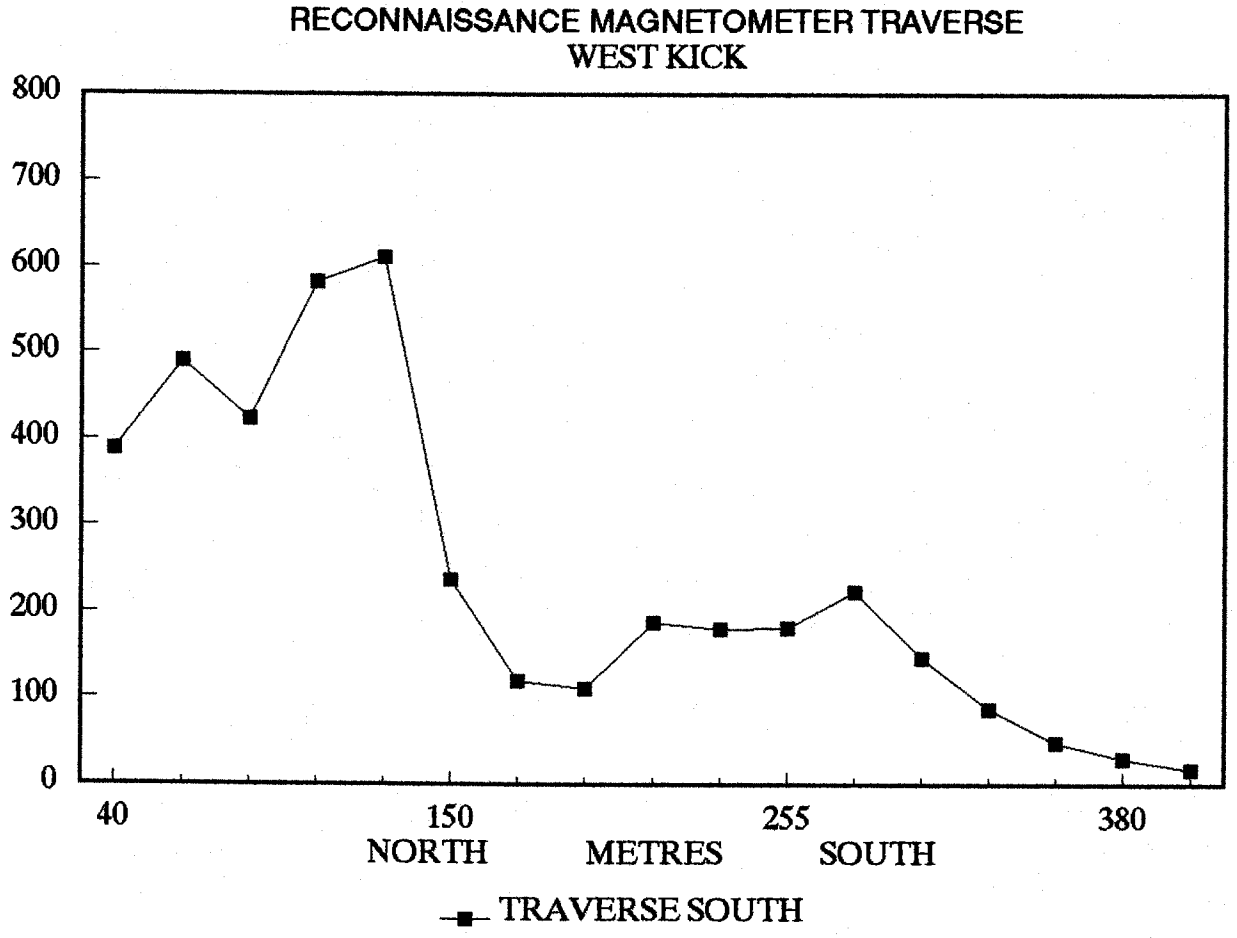
Figure 9


RECONNAISSANCE MAGNETOMETER TRAVERSE
WEST KICK
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METRES
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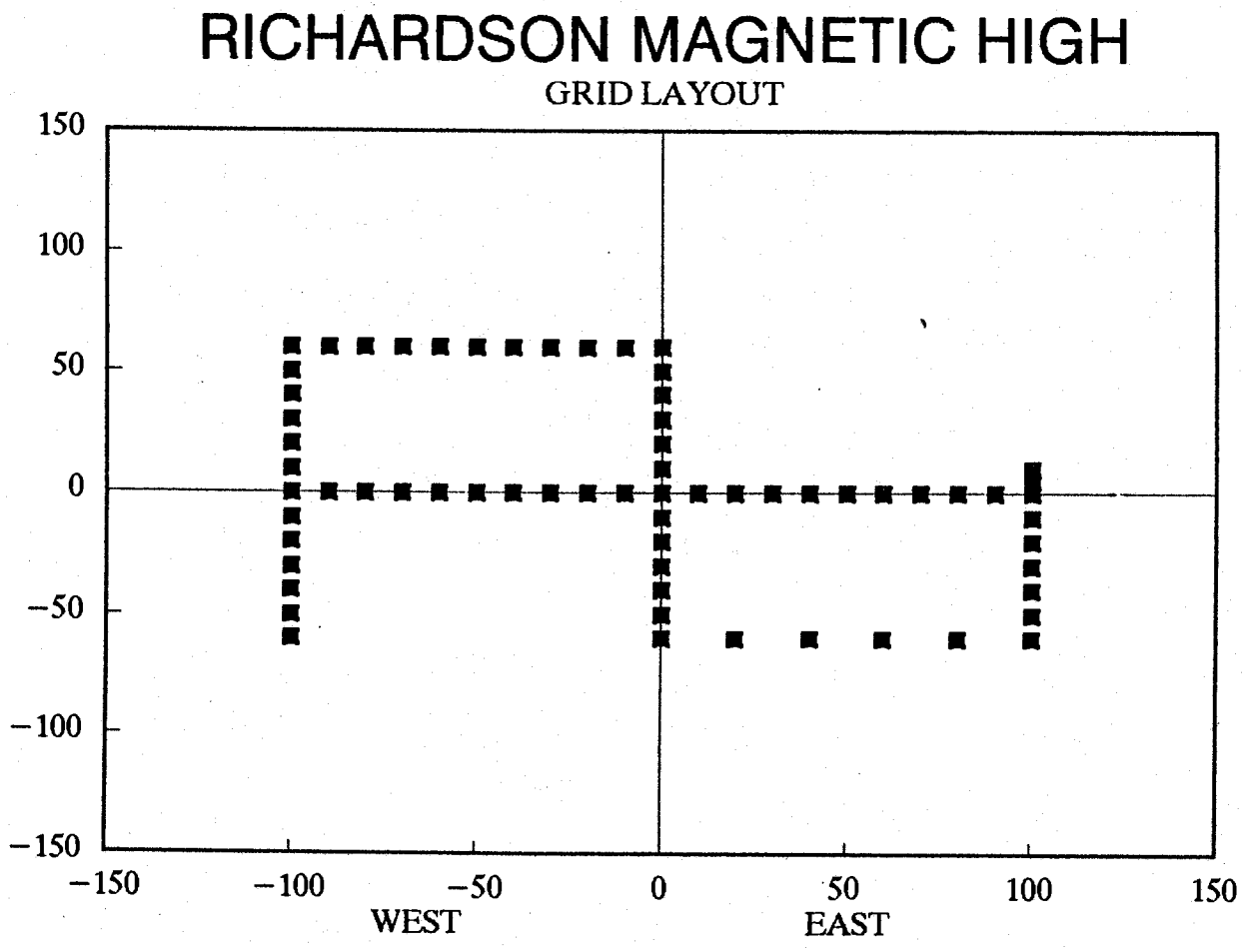
TRAVERSE SOUTH

Figure 10



Note:

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Figure 11 Rev 1

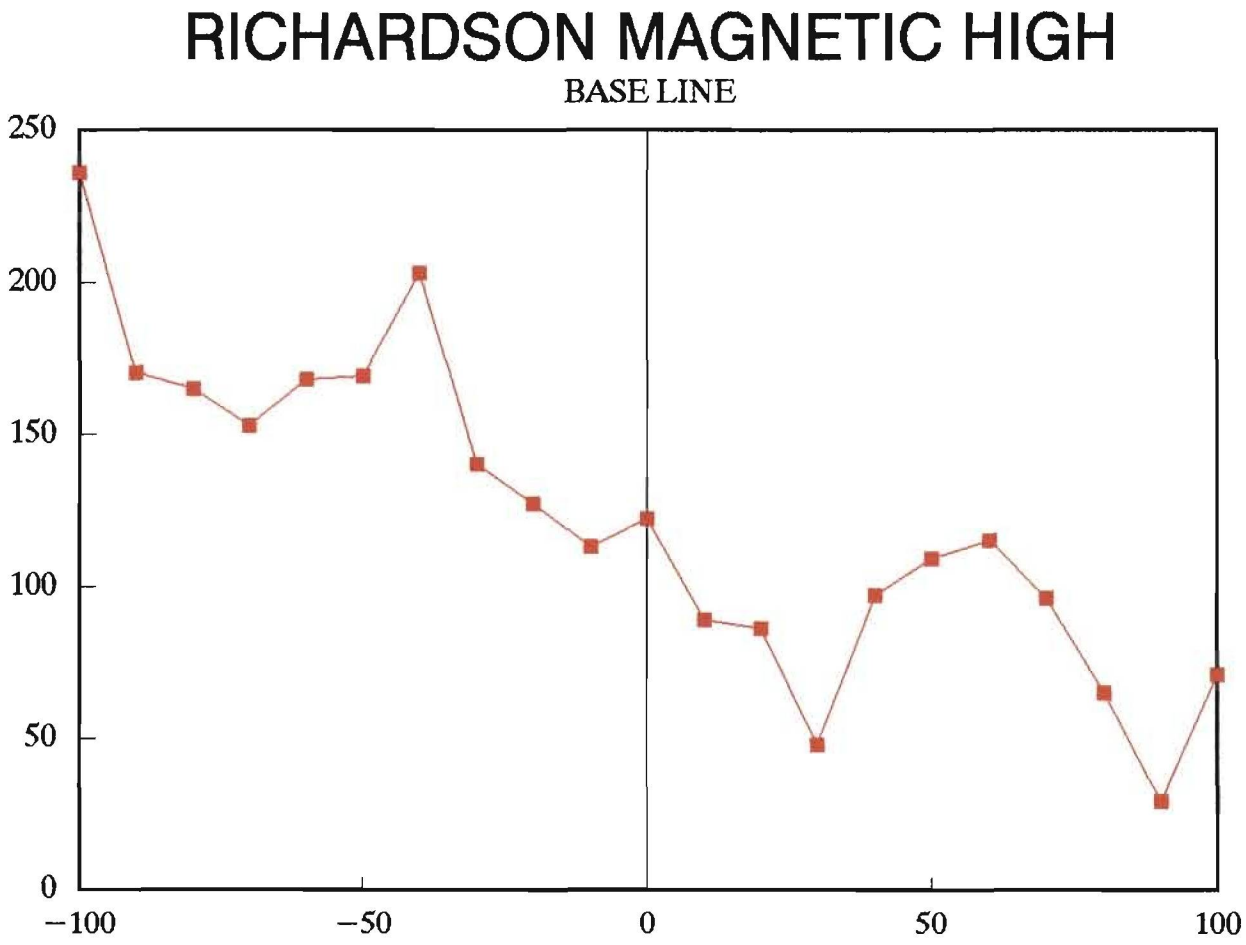
RICHARDSON MAGNETIC HIGH
BASE LINE
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Figure 12

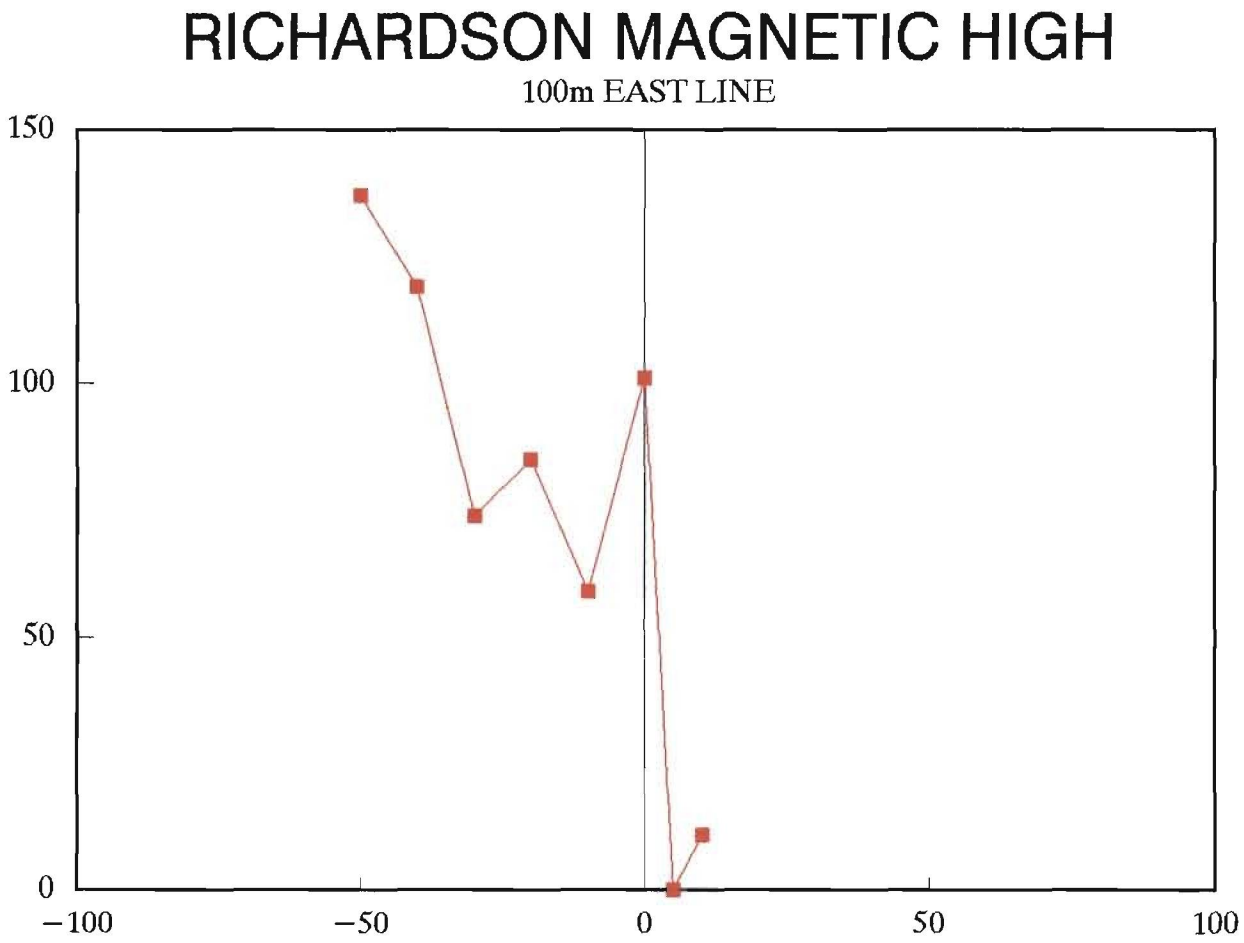
RICHARDSON MAGNETIC HIGH
100m EAST LINE
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Figure 13

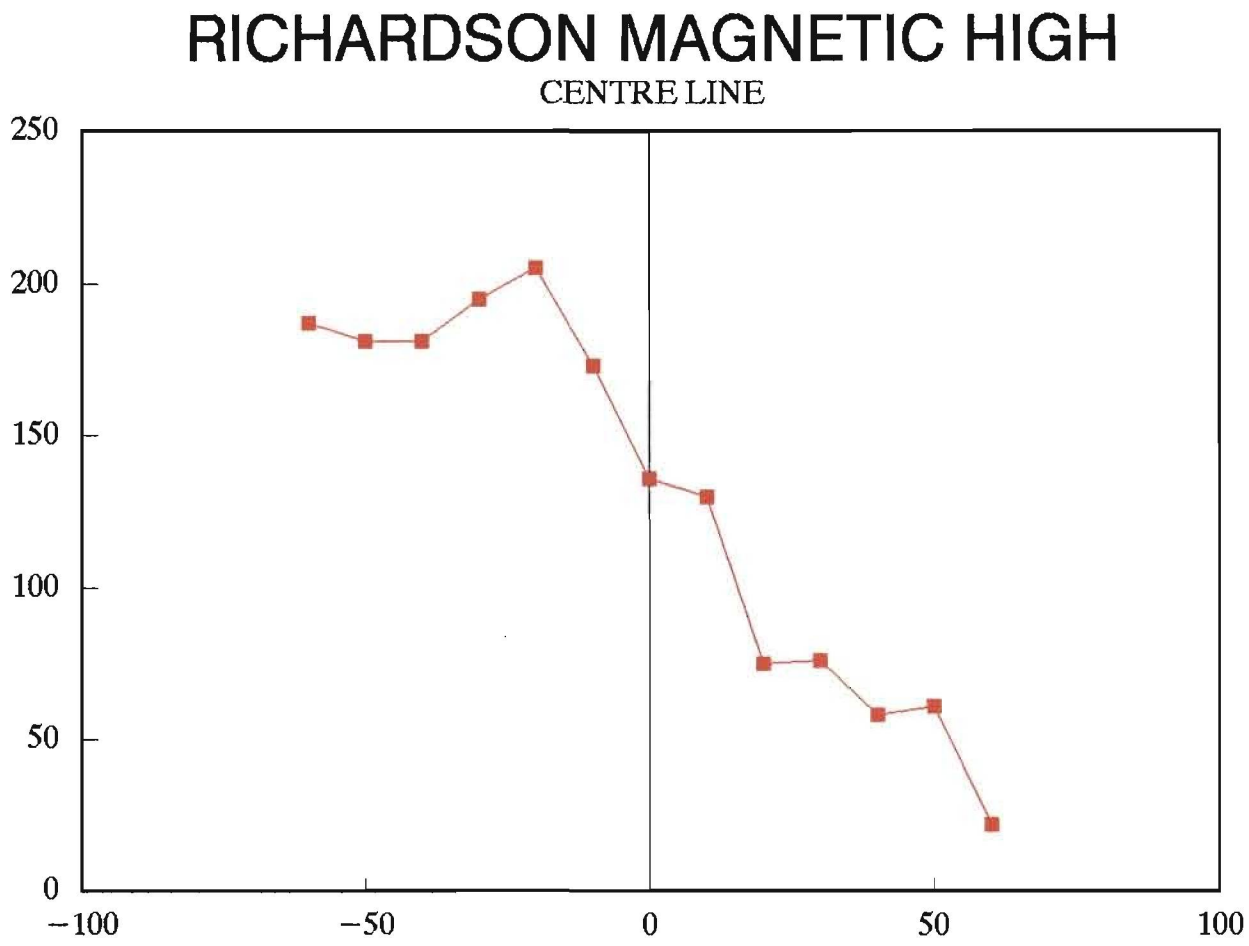
RICHARDSON MAGNETIC HIGH
CENTRE LINE
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Figure 14

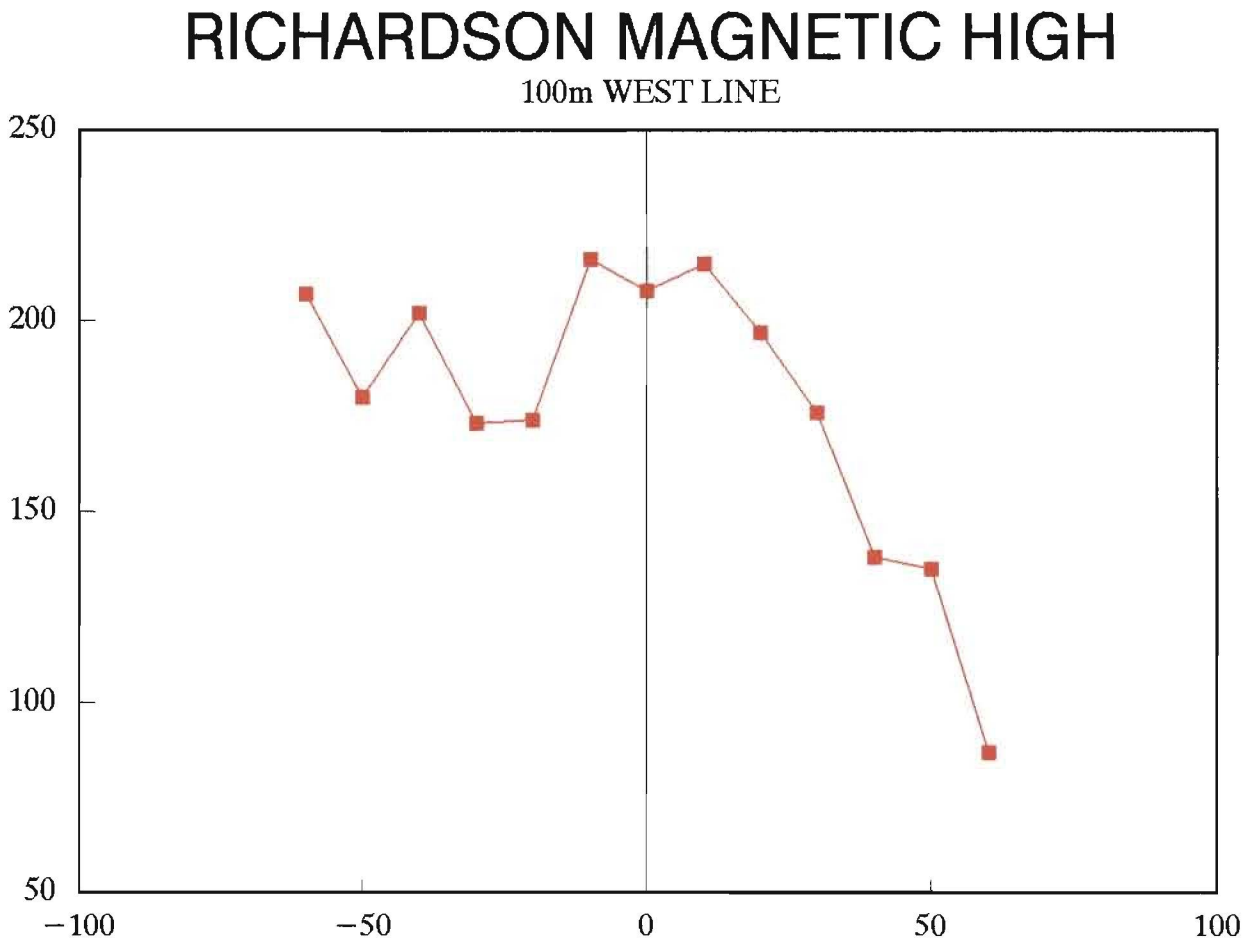
RICHARDSON MAGNETIC HIGH
100m WEST LINE
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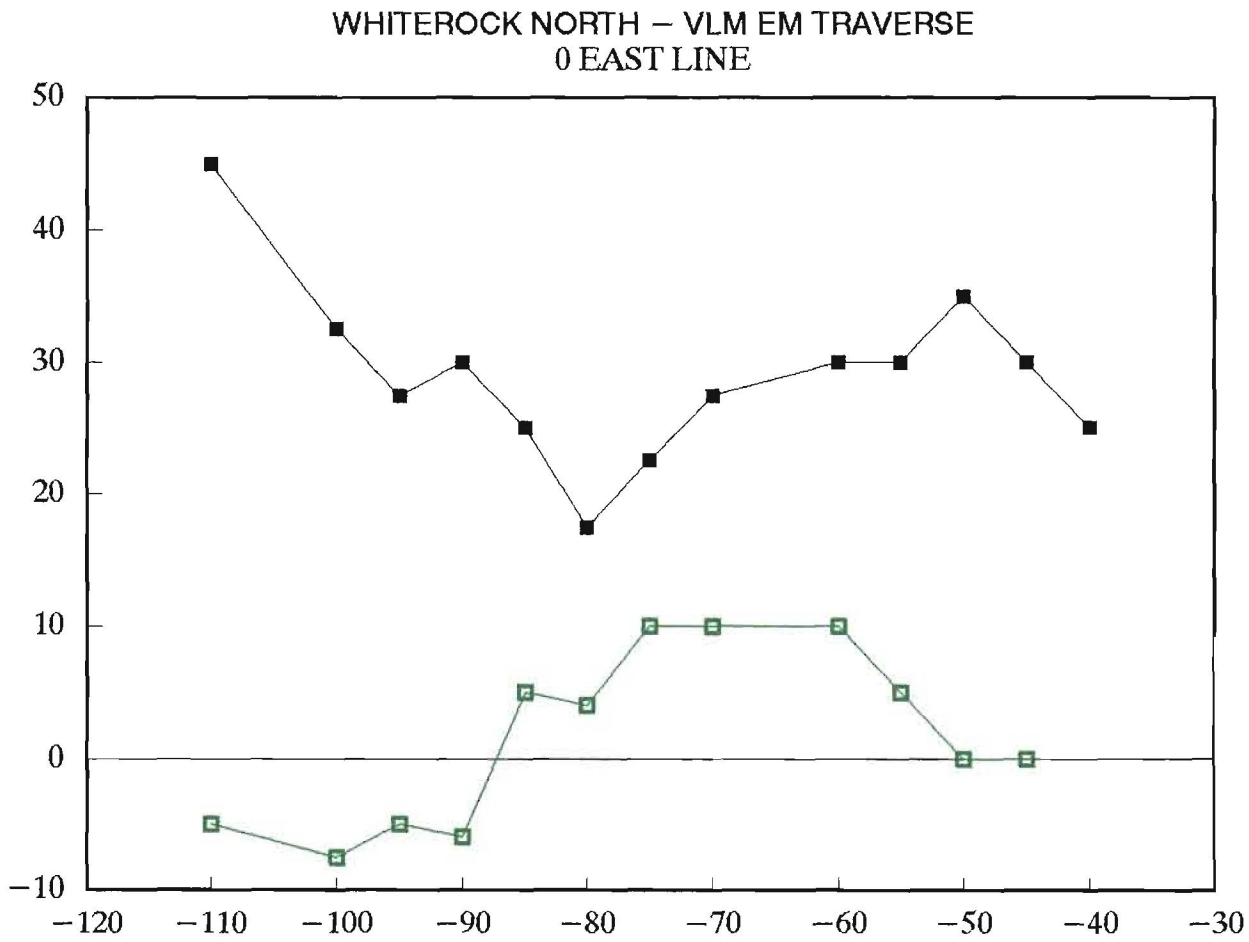
Figure 15


WHITEROCK NORTH – VLM EM TRAVERSE
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50
40
30
20
10
0
−10
−120
−110
−100
−90
−80
−70
−60
−50
−40
−30

Figure 16

WHITEROCK NORTH – VLF EM TRAVERSE

20 EAST LINE

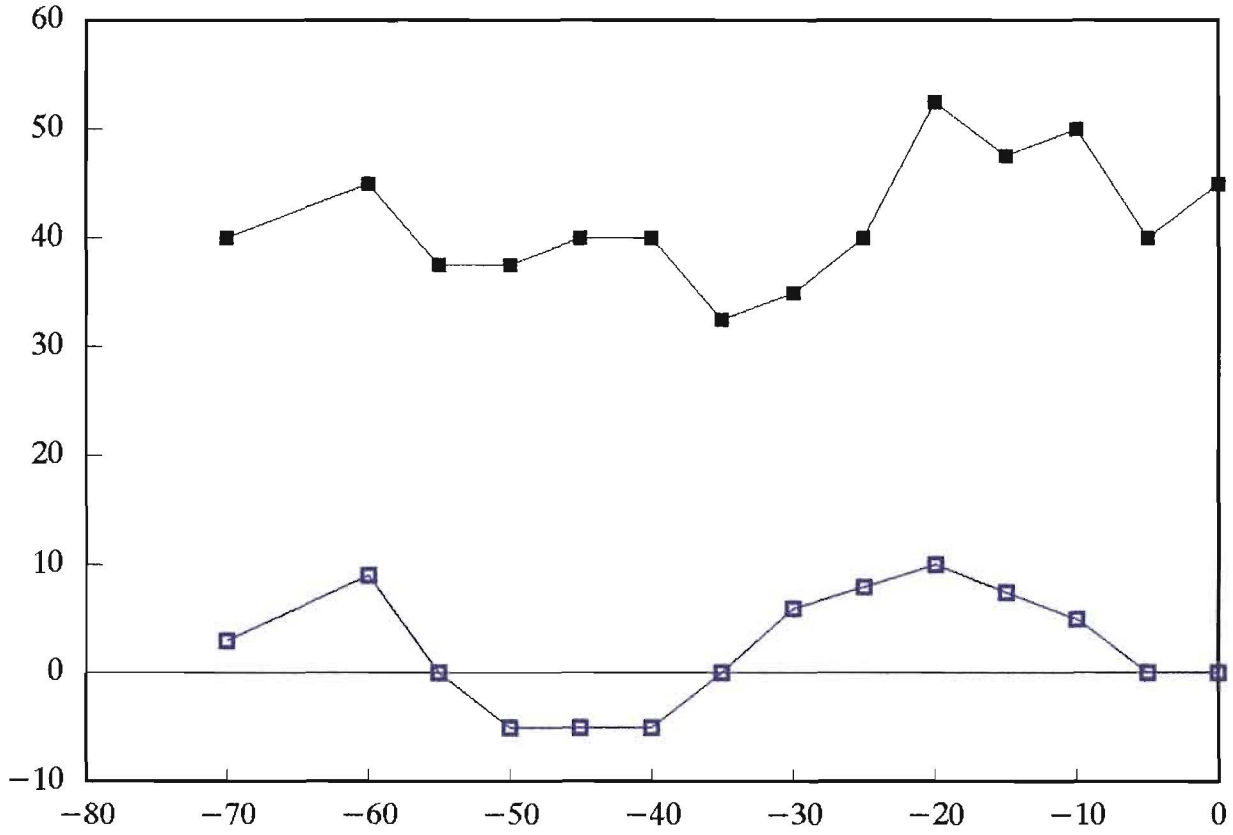


Figure 17

WHITEROCK NORTH – VLF EM TRAVERSE

40 EAST LINE

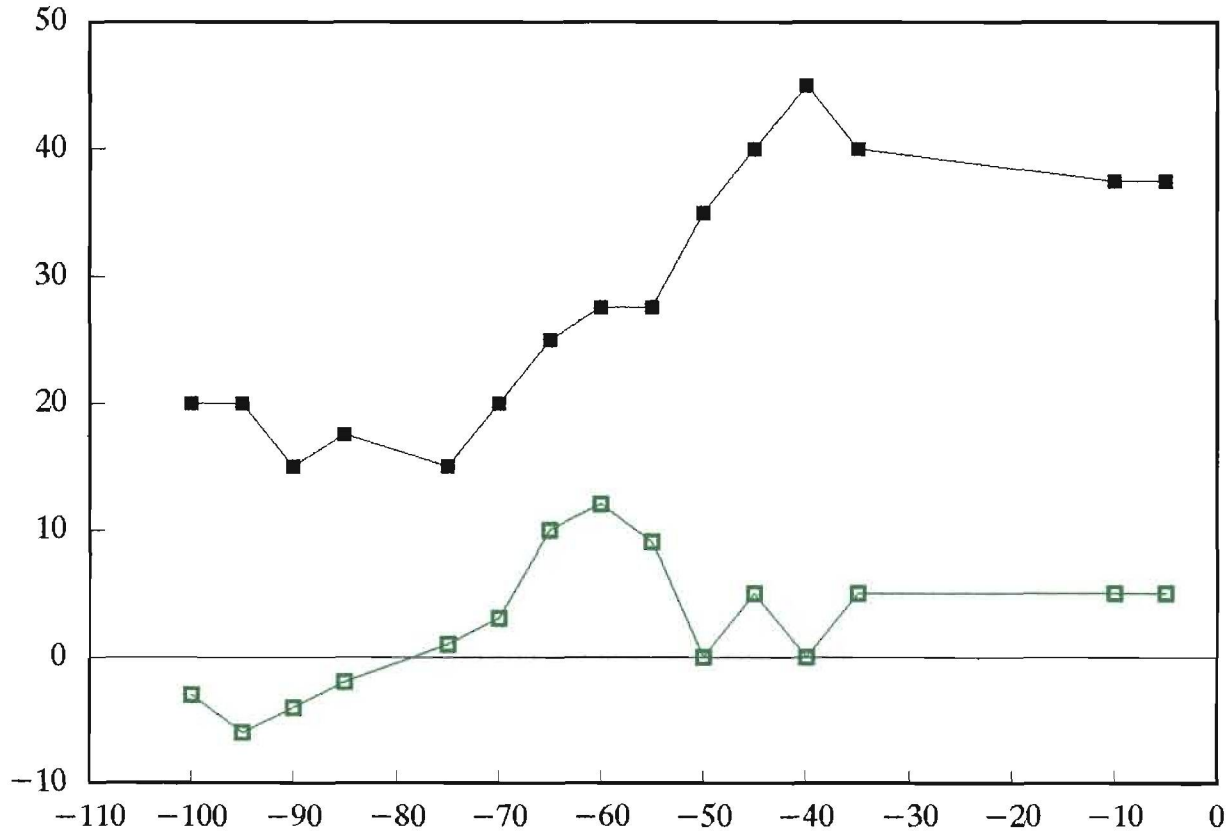


Figure 18

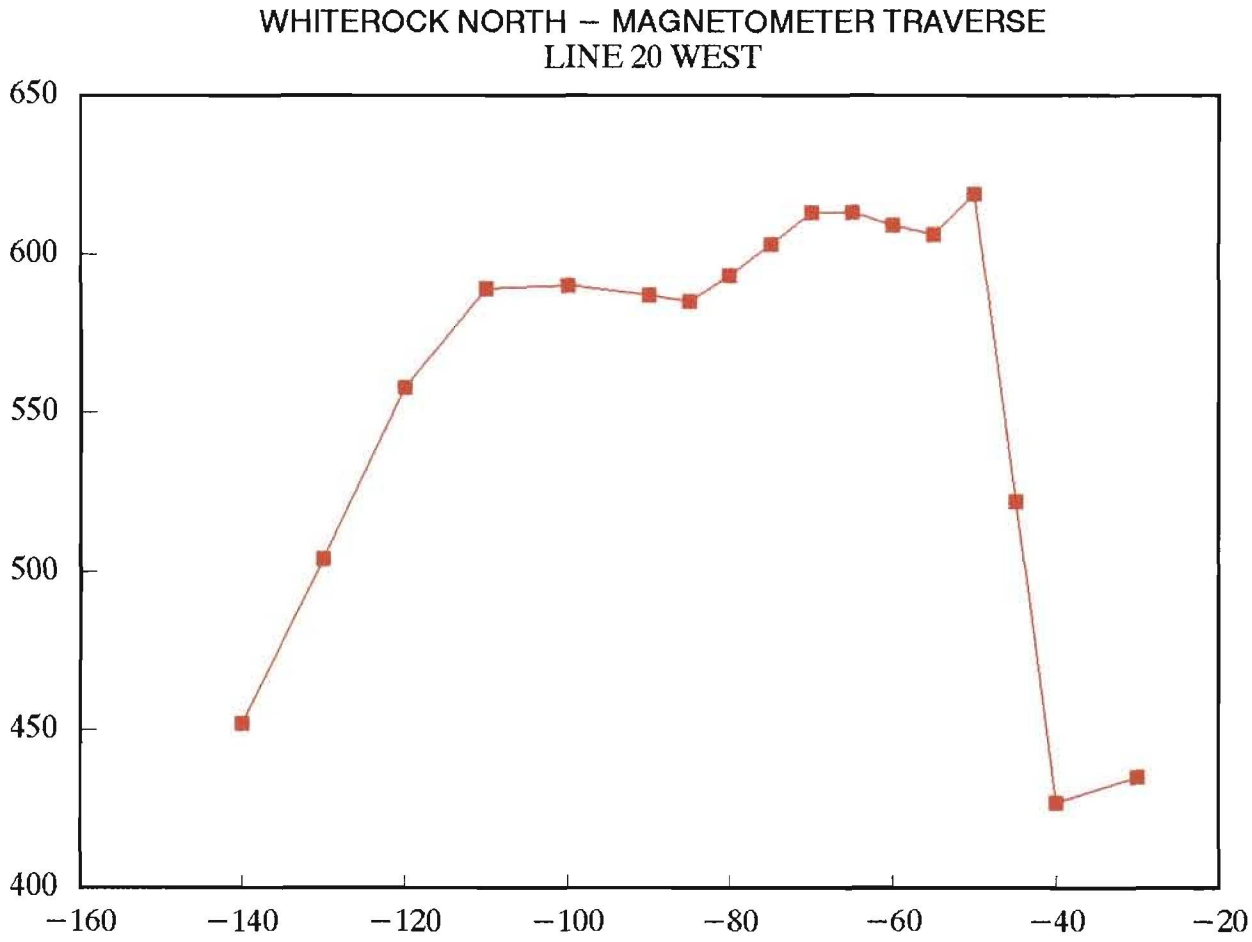

WHITEROCK NORTH – MAGNETOMETER TRAVERSE
LINE 20 WEST
650
600
550
500
450
400
−160
−140
−120
−100
−80
−60
−40
−20

Figure 19

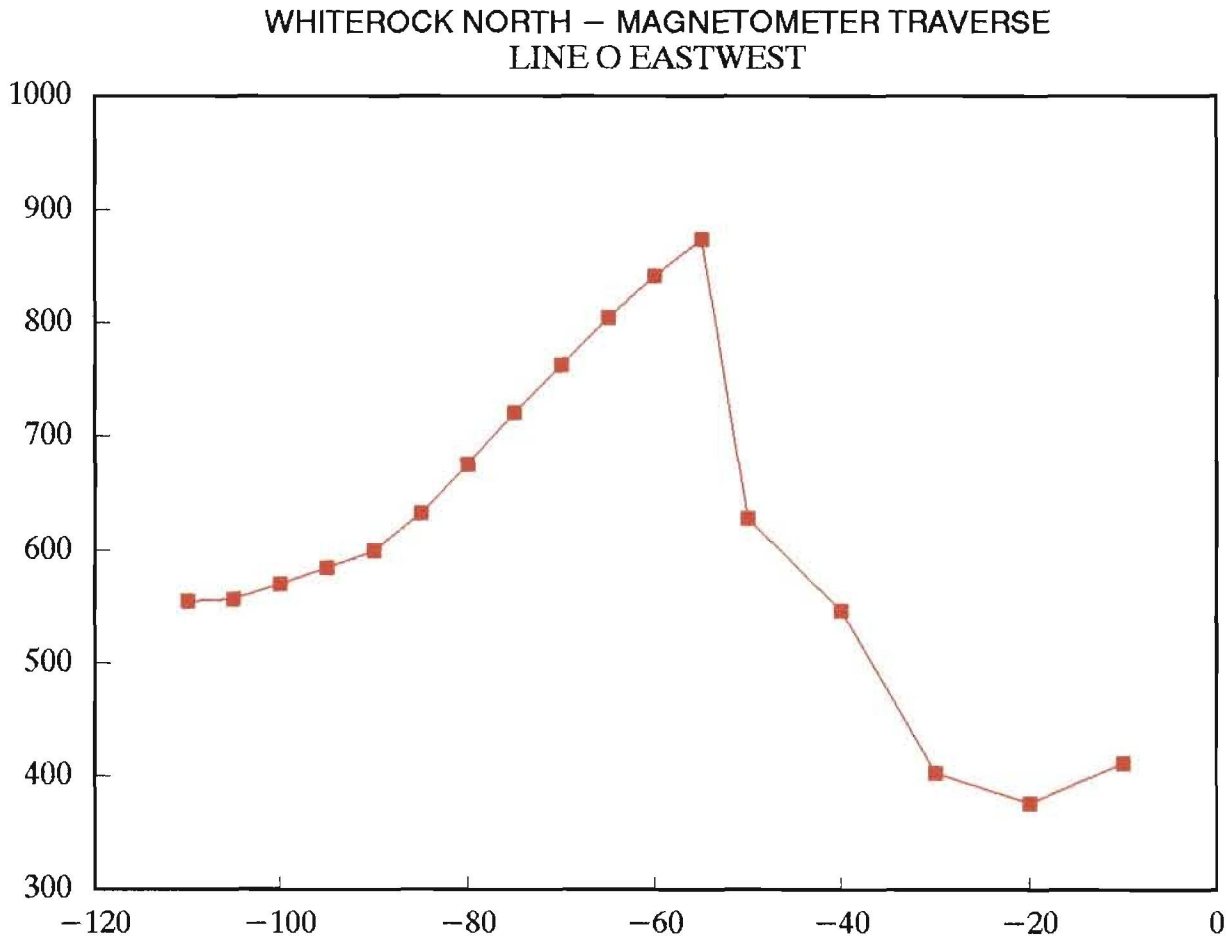

WHITEROCK NORTH – MAGNETOMETER TRAVERSE
LINE O EASTWEST
1000
900
800
700
600
500
400
300
−120
−100
−80
−60
−40
−20
0

Figure 20

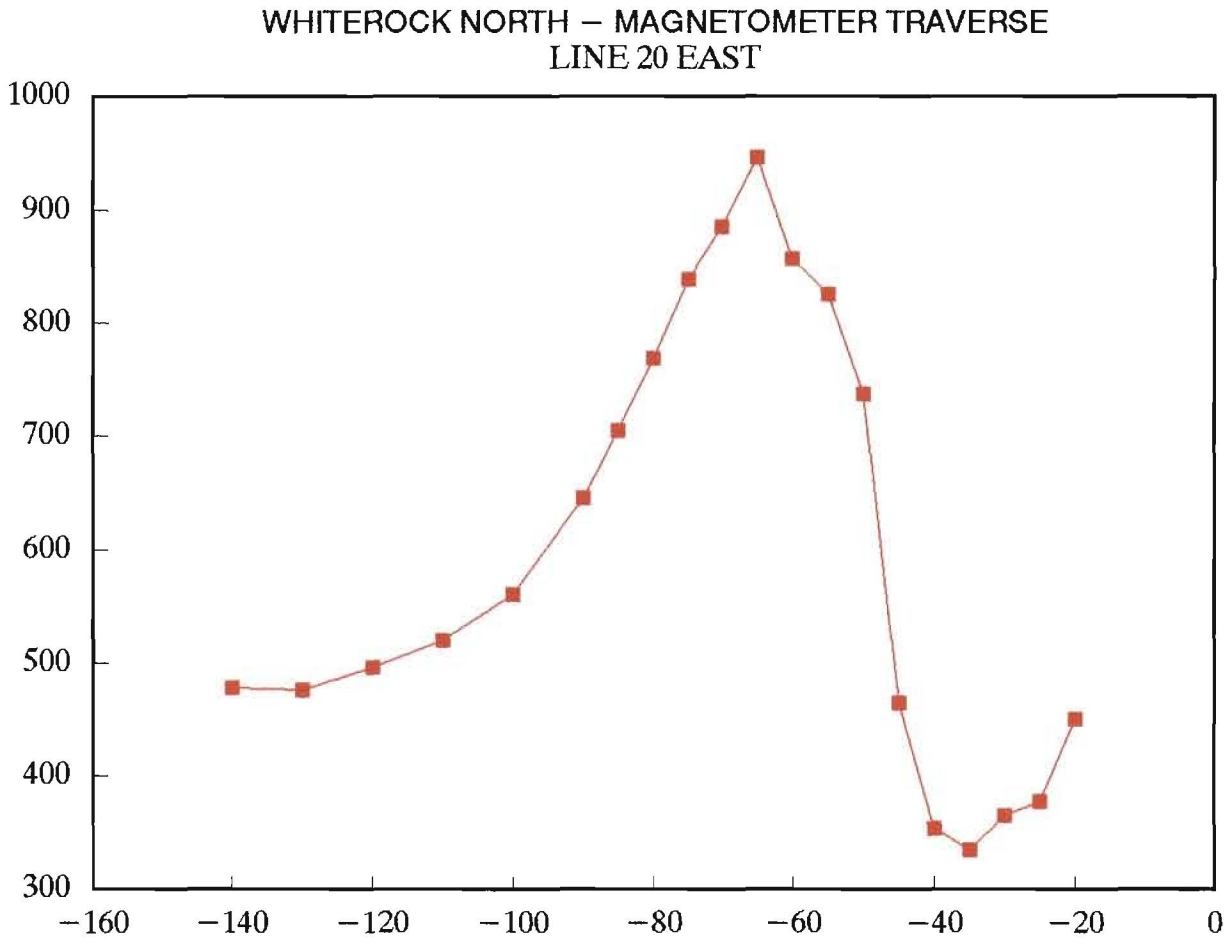

WHITEROCK NORTH – MAGNETOMETER TRAVERSE
LINE 20 EAST
1000
900
800
700
600
500
400
300
−160
−140
−120
−100
−80
−60
−40
−20
0

Figure 21

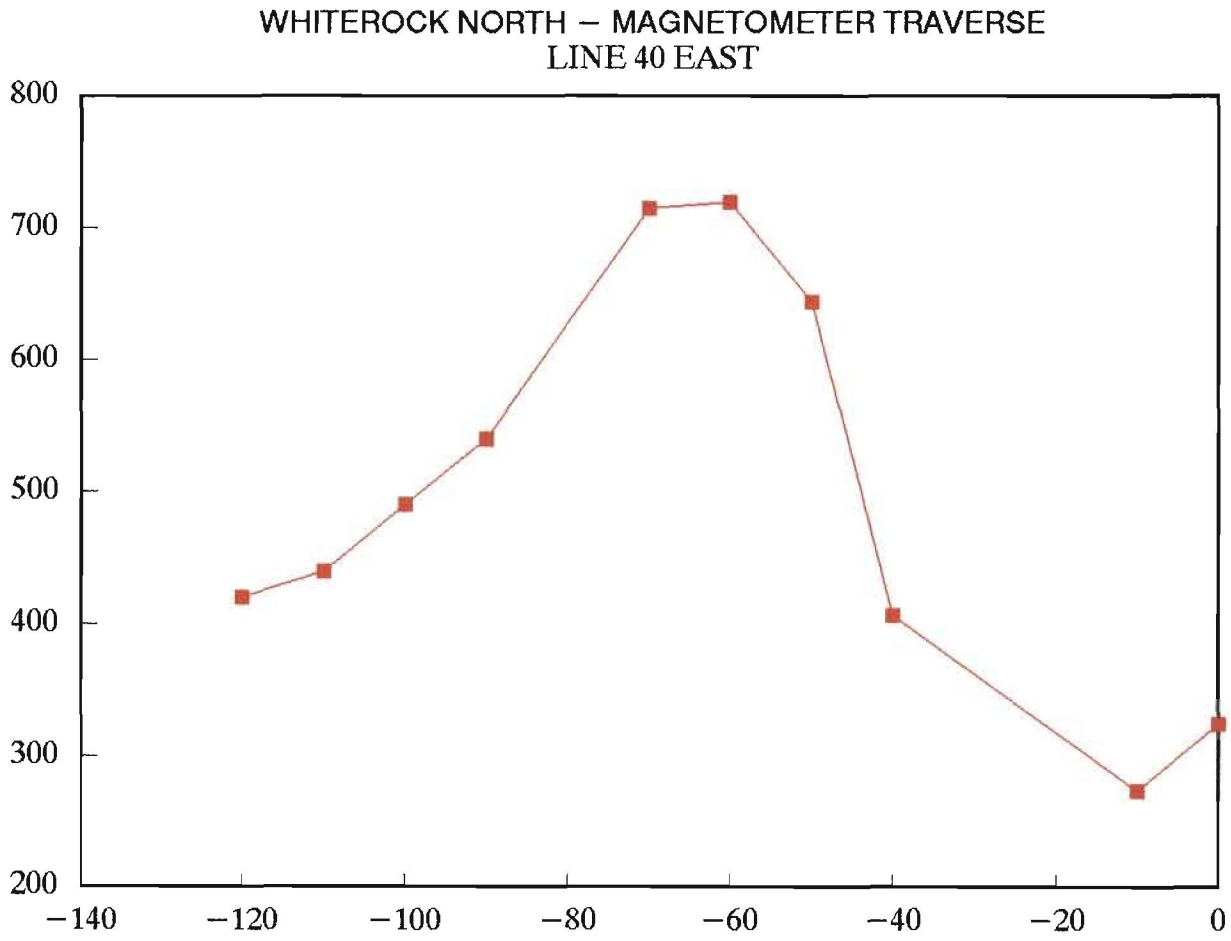

WHITEROCK NORTH – MAGNETOMETER TRAVERSE
LINE 40 EAST
800
700
600
500
400
300
200
−140
−120
−100
−80
−60
−40
−20
0

Figure 22

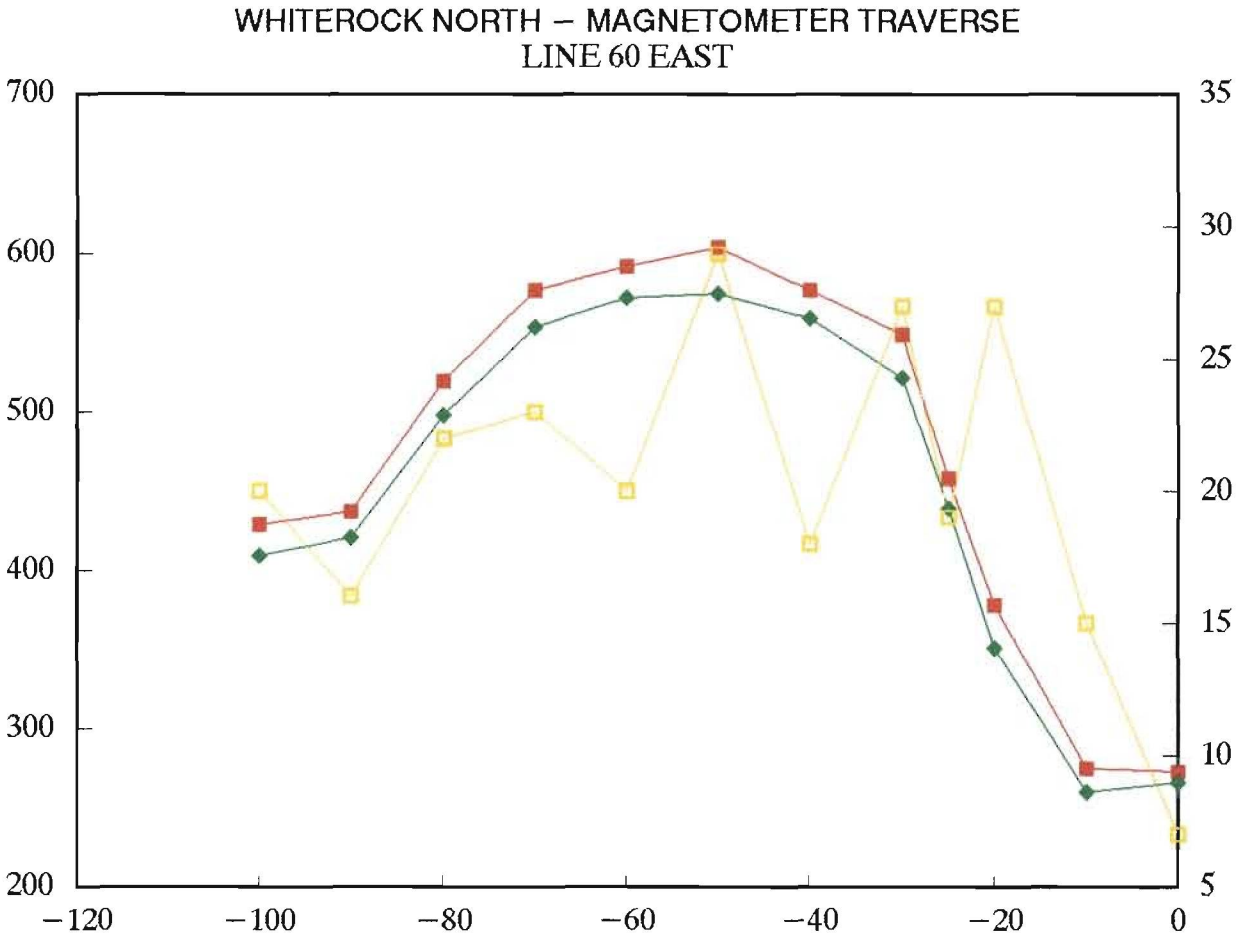

WHITEROCK NORTH – MAGNETOMETER TRAVERSE
LINE 60 EAST
700
600
500
400
300
200
35
30
25
20
15
10
5
−120
−100
−80
−60
−40
−20
0

Figure 23

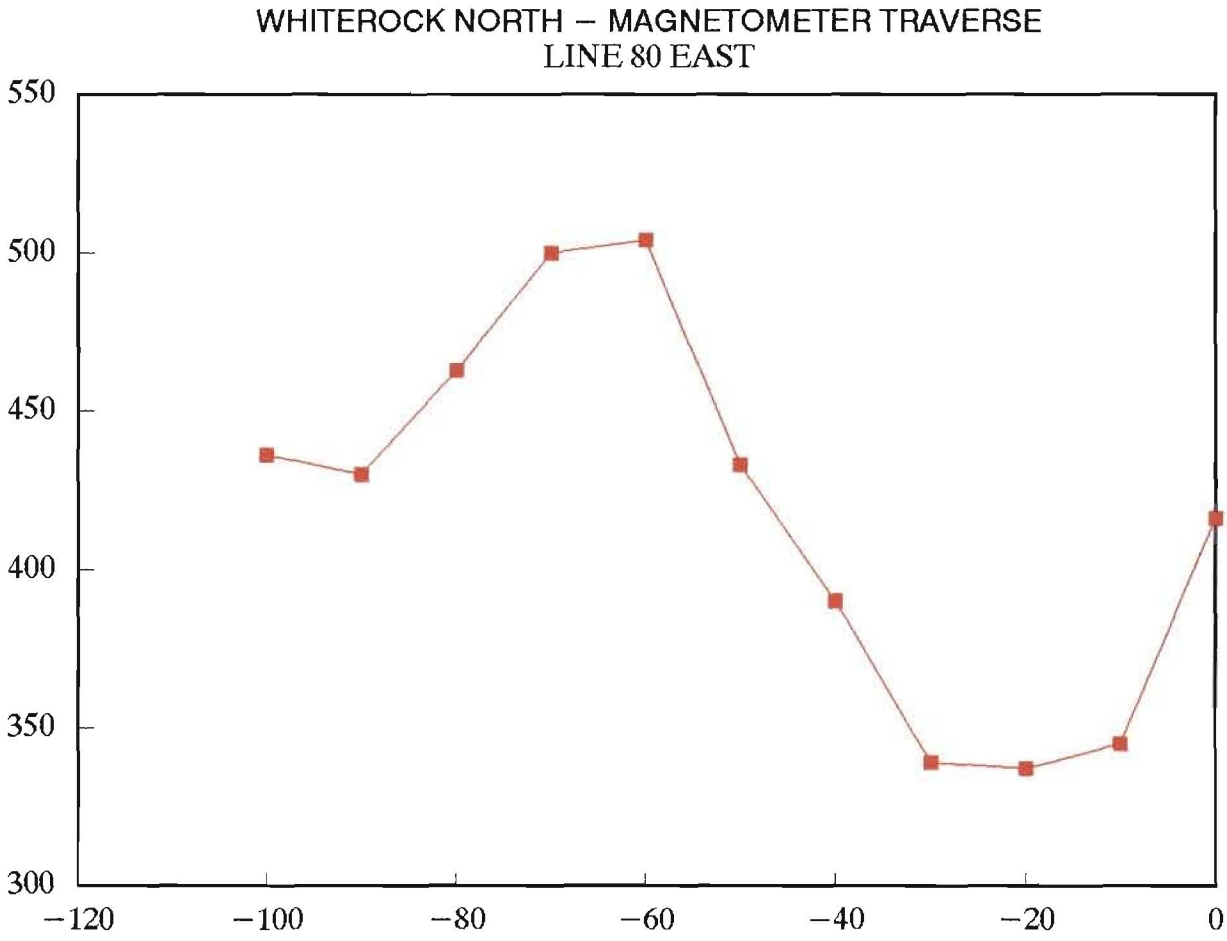

WHITEROCK NORTH – MAGNETOMETER TRAVERSE
LINE 80 EAST
550
500
450
400
350
300
−120
−100
−80
−60
−40
−20
0

Figure 24

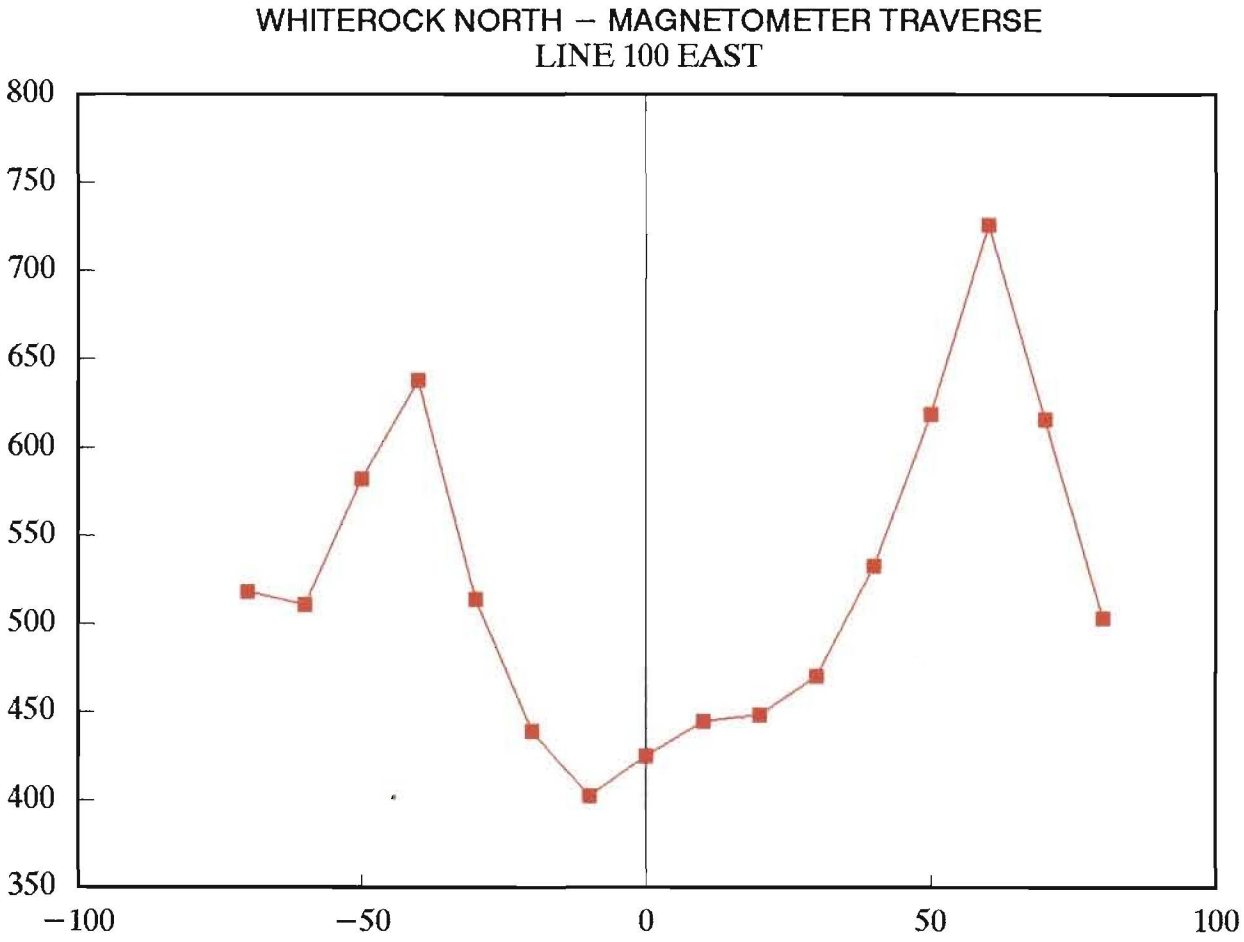

WHITEROCK NORTH – MAGNETOMETER TRAVERSE
LINE 100 EAST
800
750
700
650
600
550
500
450
400
350
−100
−50
0
50
100

Figure 25

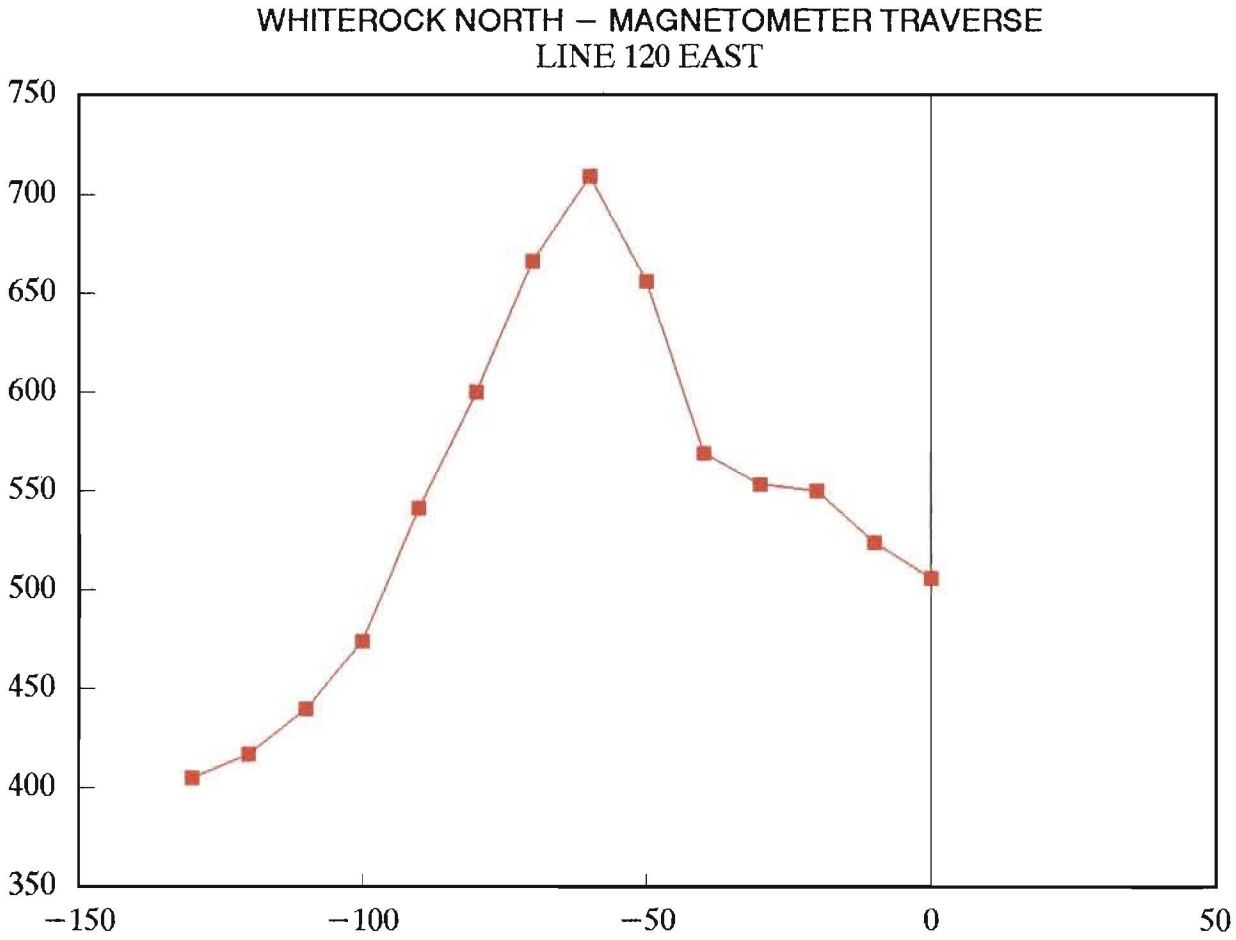

WHITEROCK NORTH – MAGNETOMETER TRAVERSE
LINE 120 EAST
750
700
650
600
550
500
450
400
350
−150
−100
−50
0
50

Figure 26

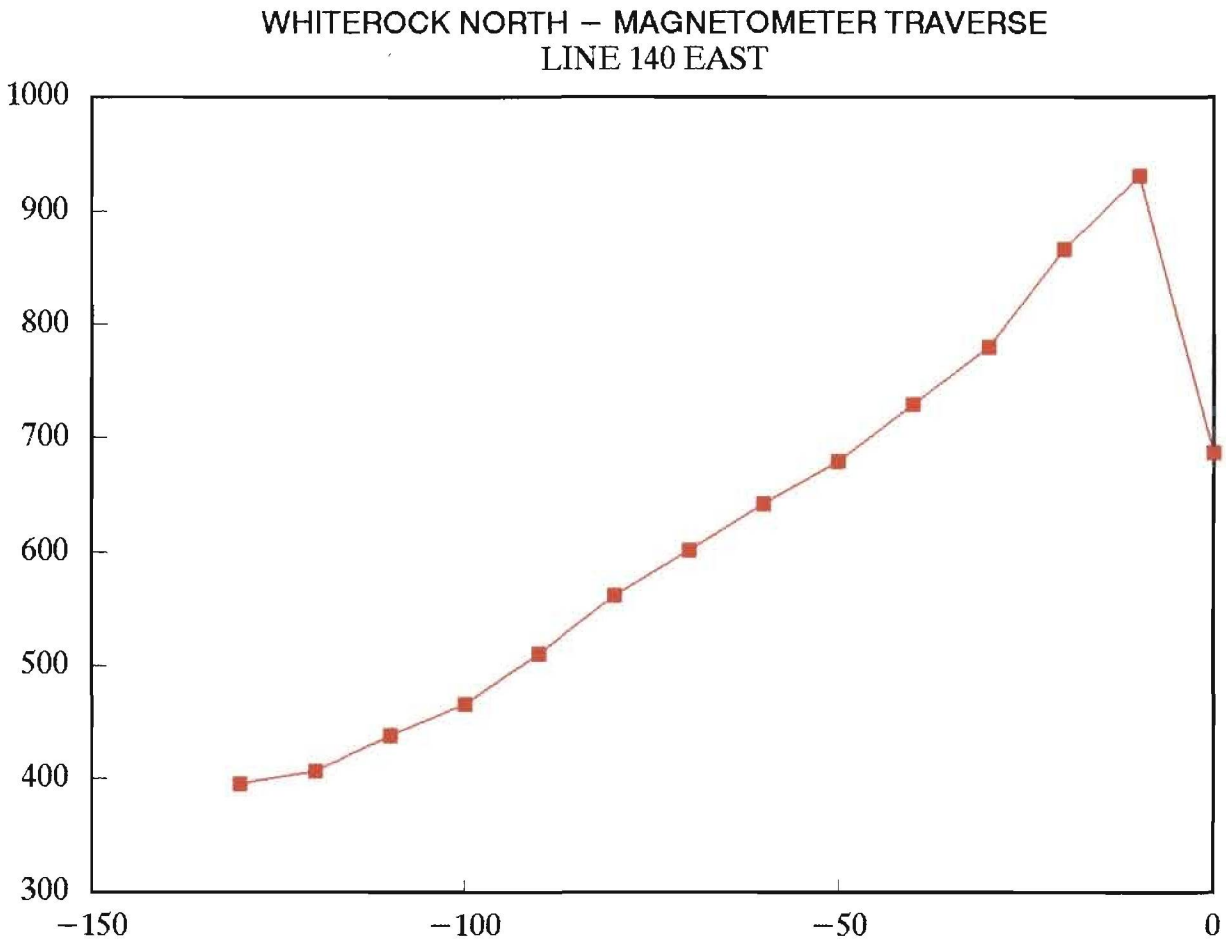

WHITEROCK NORTH – MAGNETOMETER TRAVERSE
LINE 140 EAST
1000
900
800
700
600
500
400
300
−150
−100
−50
0

Figure 27

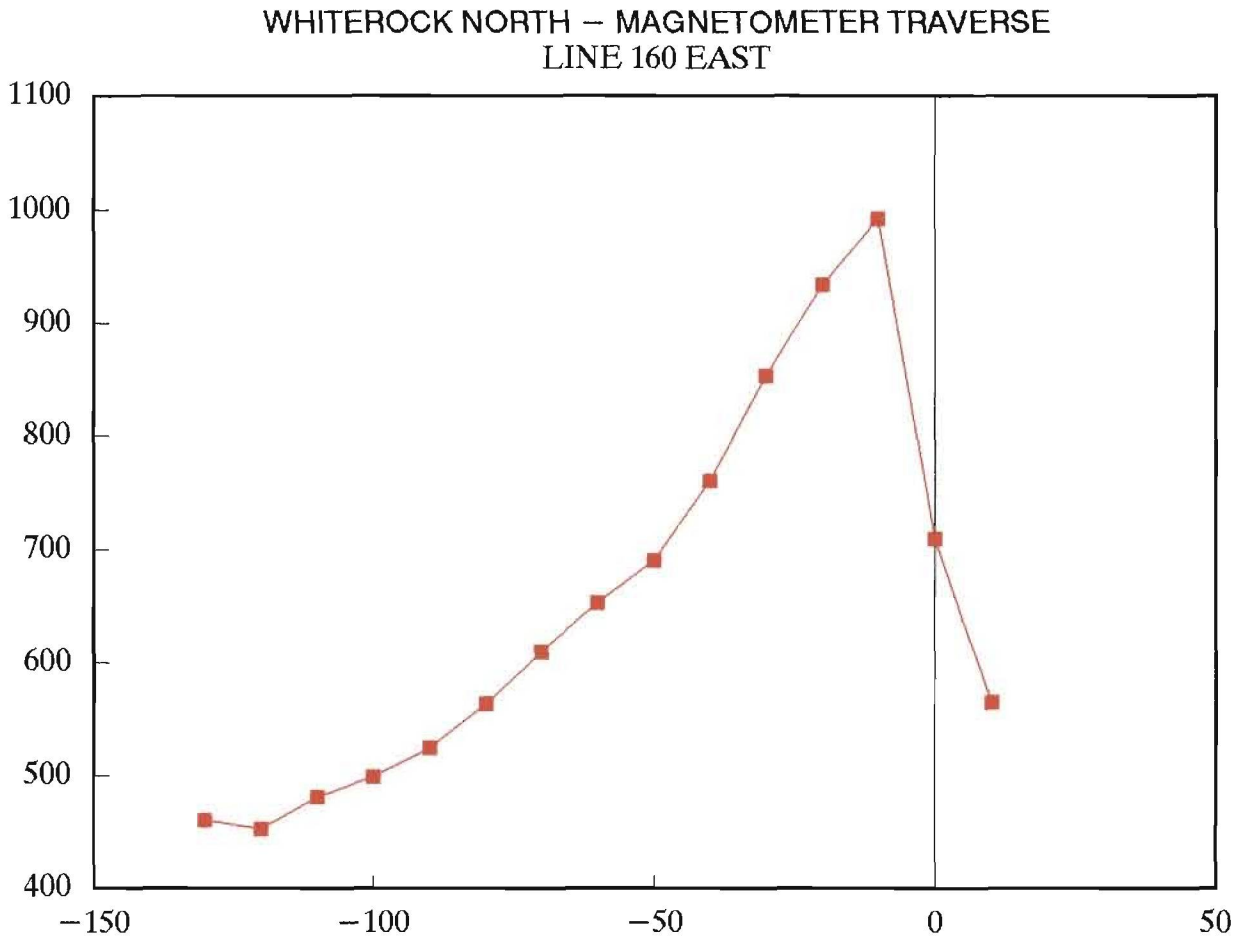

WHITEROCK NORTH – MAGNETOMETER TRAVERSE
LINE 160 EAST
1100
1000
900
800
700
600
500
400
−150
−100
−50
0
50

Figure 28

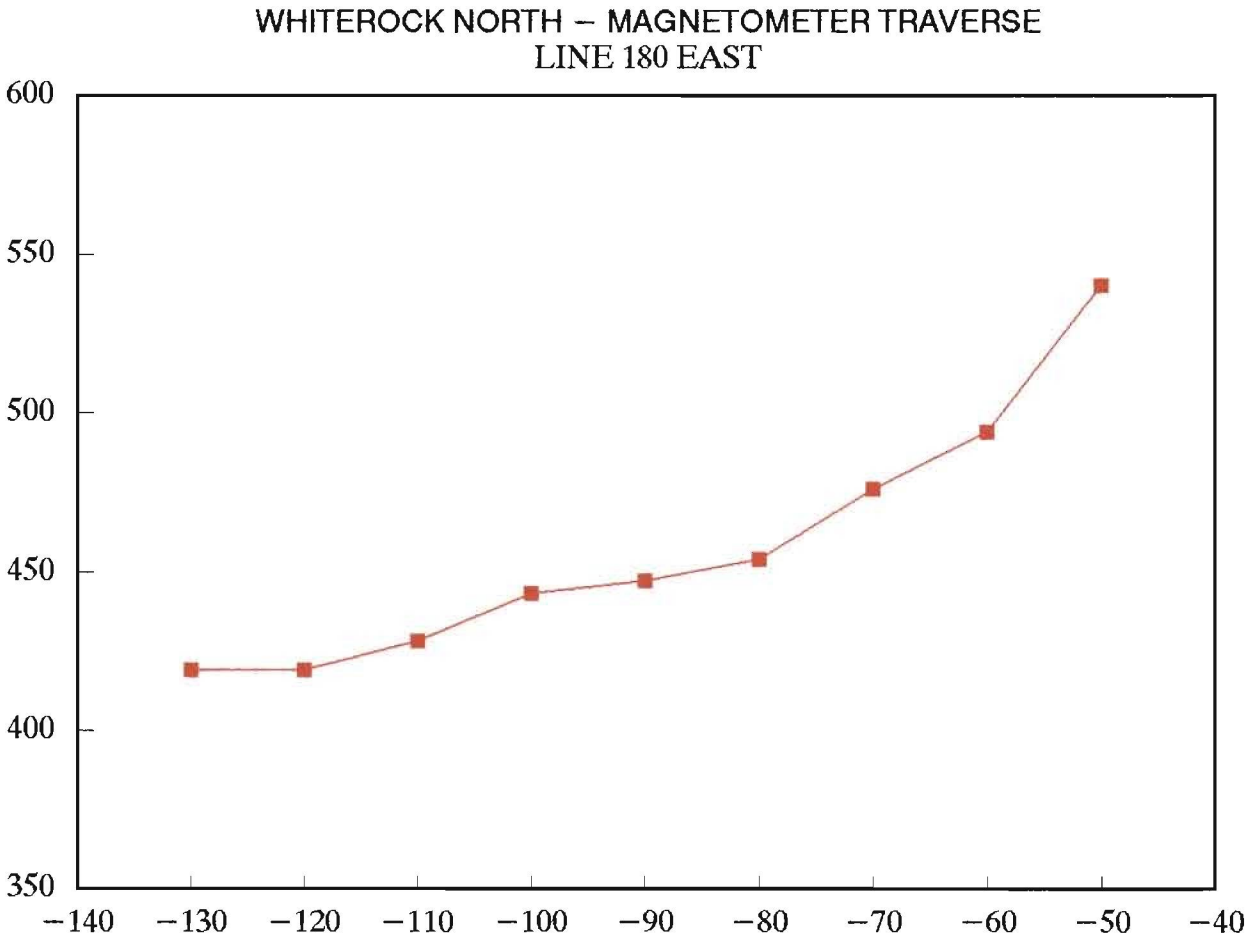
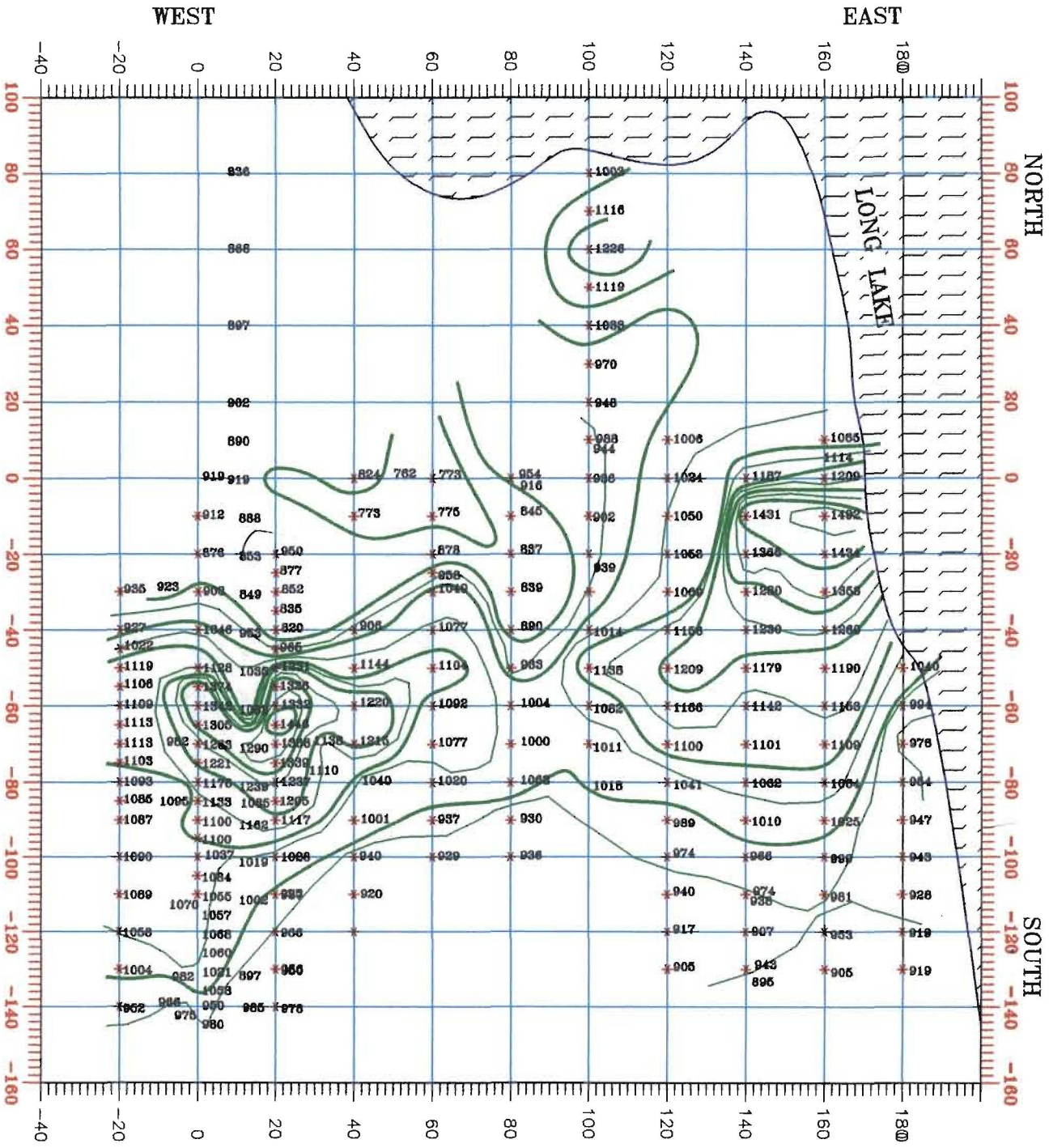

WHITEROCK NORTH – MAGNETOMETER TRAVERSE
LINE 180 EAST
600
550
500
450
400
350
−140
−130
−120
−110
−100
−90
−80
−70
−60
−50
−40

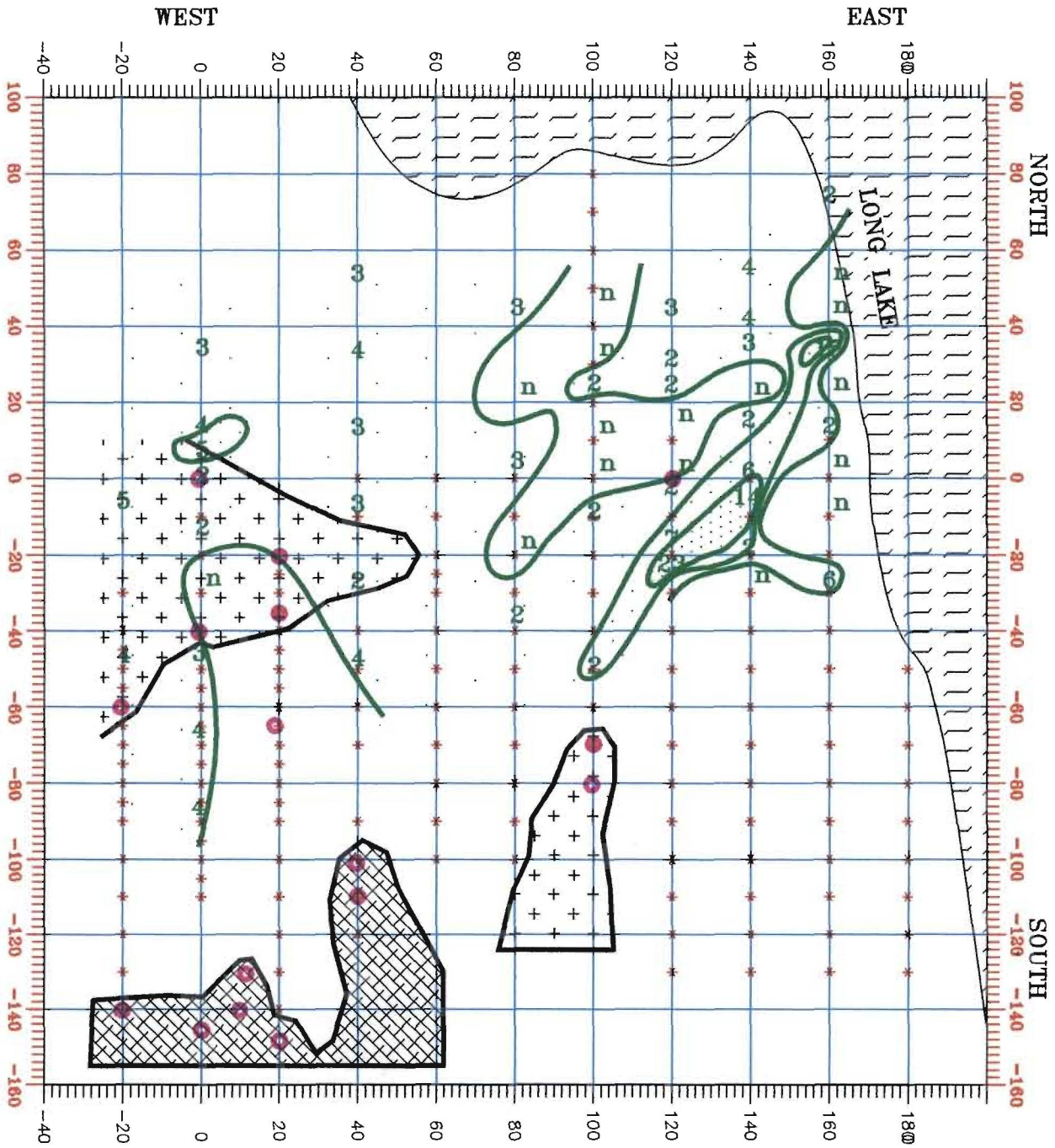
Figure 29

Figure 30



WHITEROCK NORTH
TOTAL FIELD MAGNETOMETER SURVEY

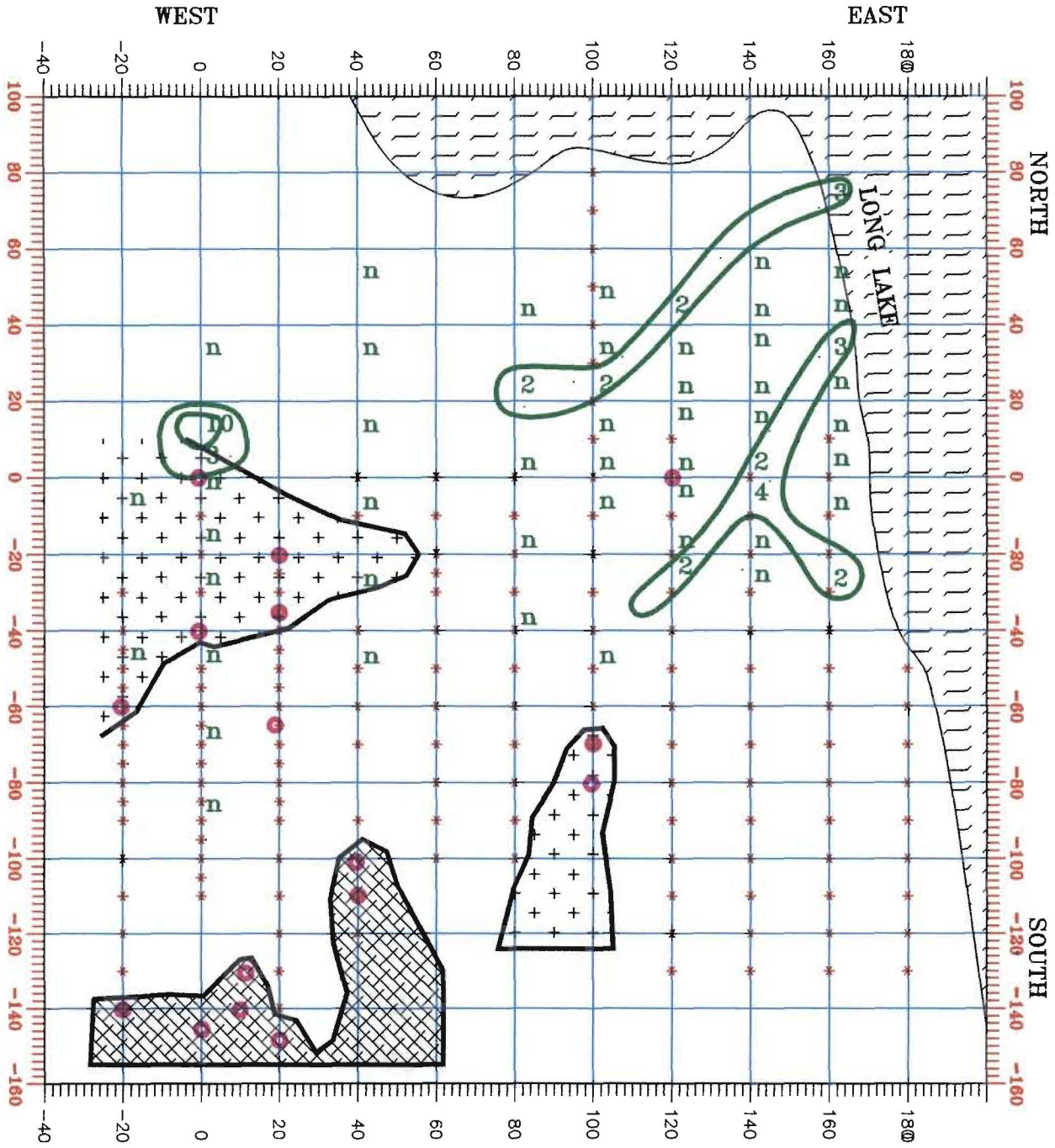
Figure 31



WHITEROCK NORTH
GEOCHEMICAL SOIL PILOT SURVEY

Ag – ppm (x10)

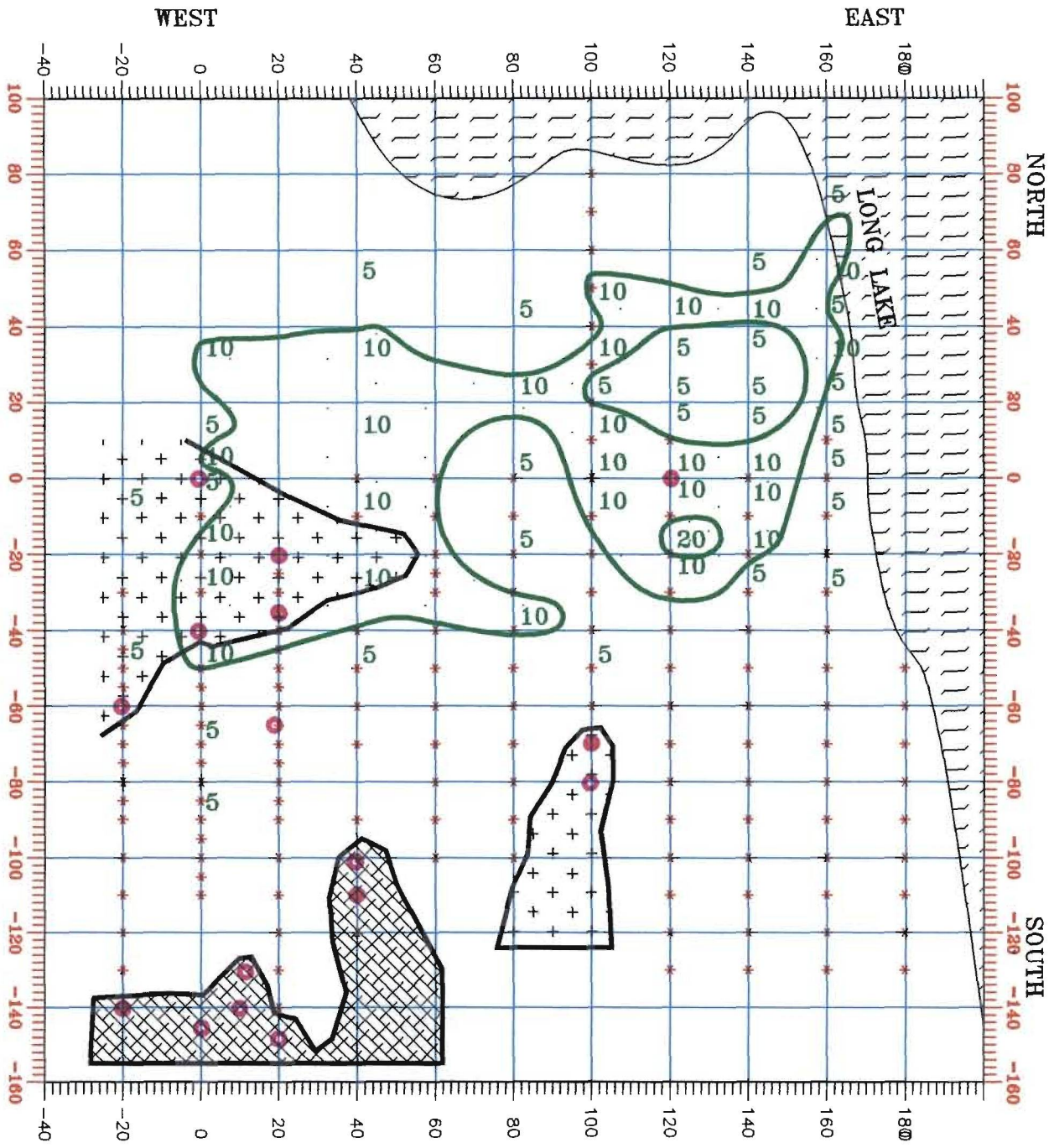
Figure 32



WHITEROCK NORTH
GEOCHEMICAL SOIL PILOT SURVEY

As – ppm

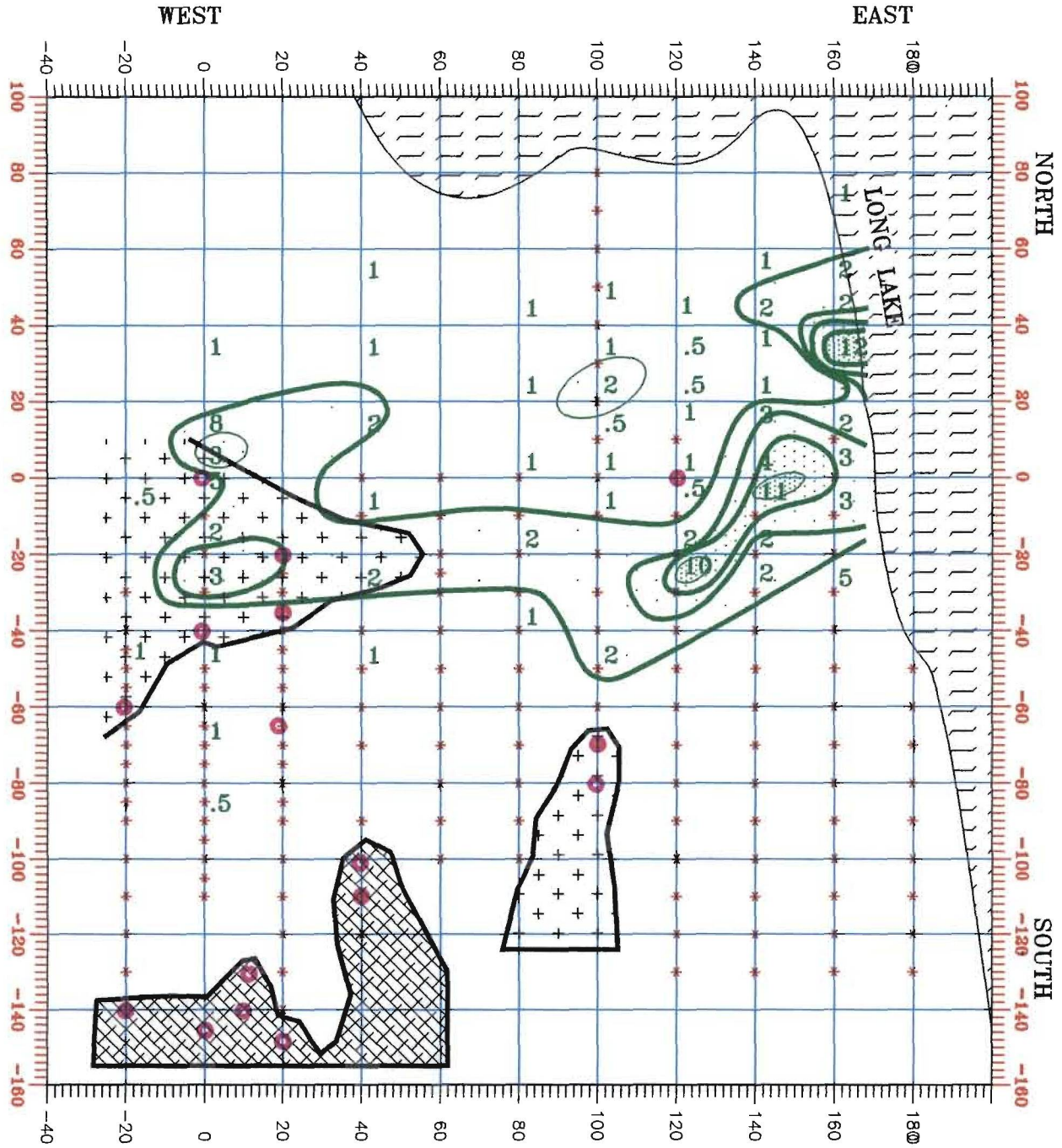
Figure 33



WHITEROCK NORTH
GEOCHEMICAL SOIL PILOT SURVEY

Co – ppm

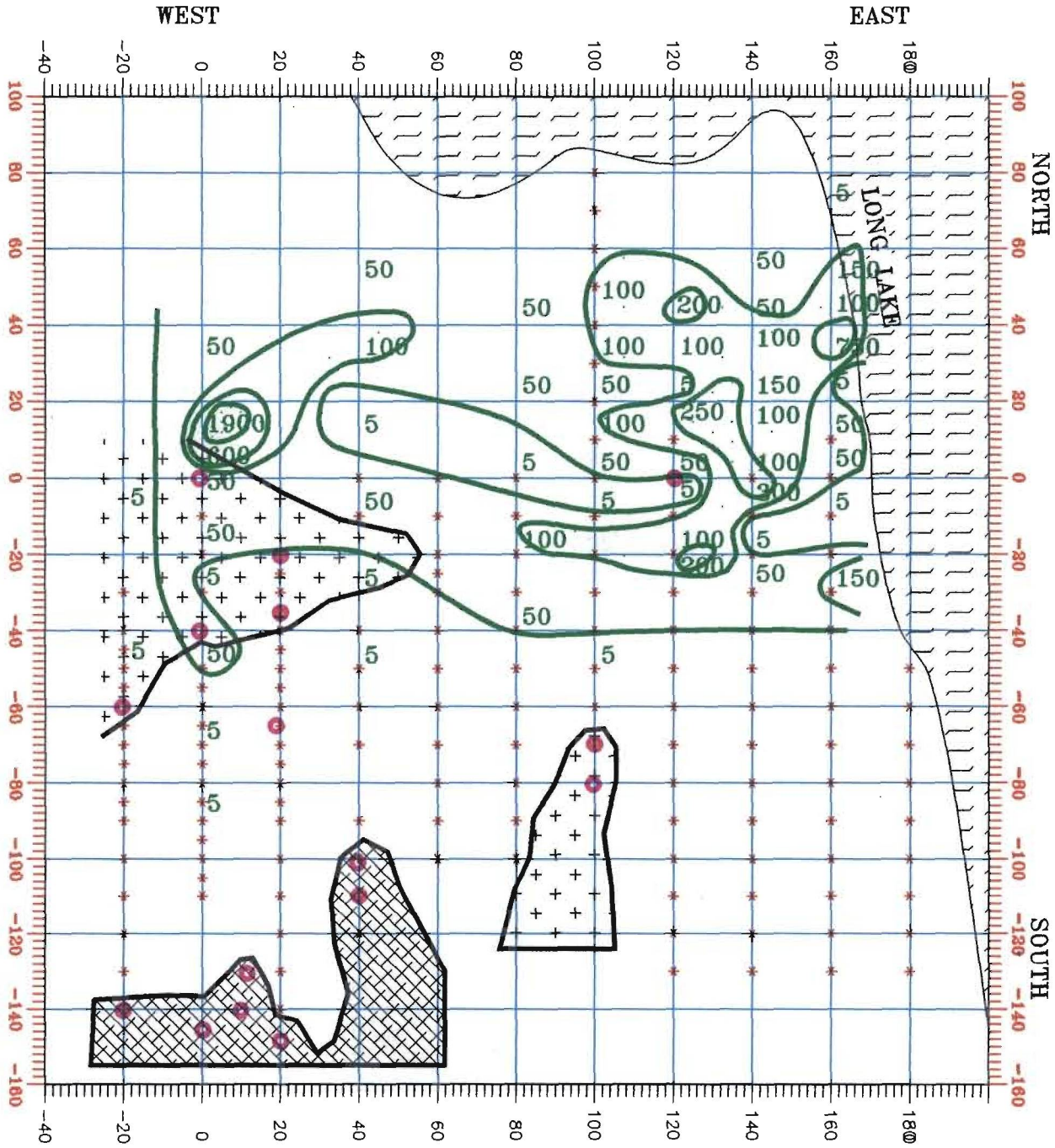
Figure 34



WHITEROCK NORTH
GEOCHEMICAL SOIL PILOT SURVEY

Cu – ppm

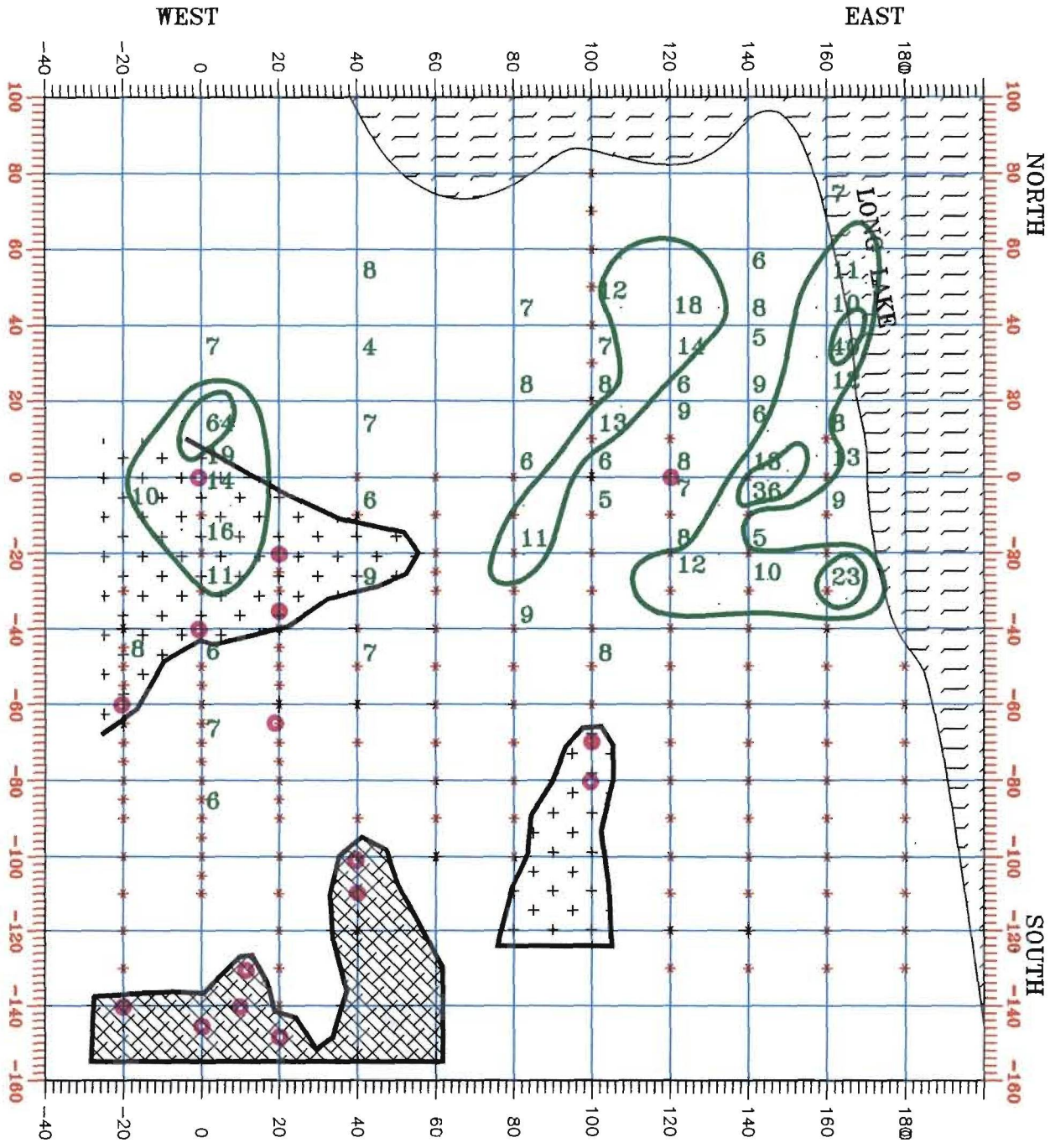
Figure 35



WHITEROCK NORTH
GEOCHEMICAL SOIL PILOT SURVEY

Fe – ppm

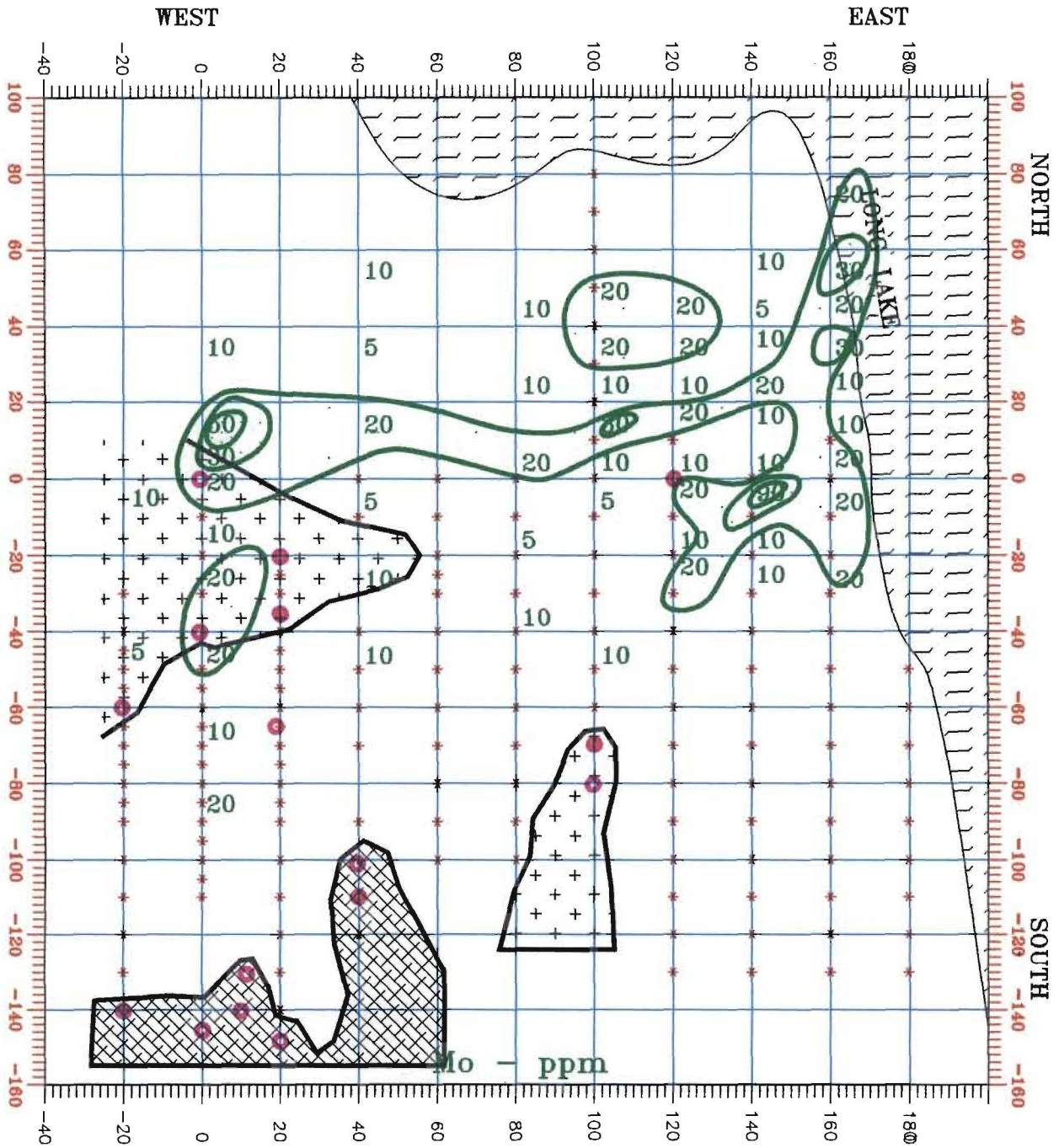
Figure 36



WHITEROCK NORTH
GEOCHEMICAL SOIL PILOT SURVEY

Mn – ppm

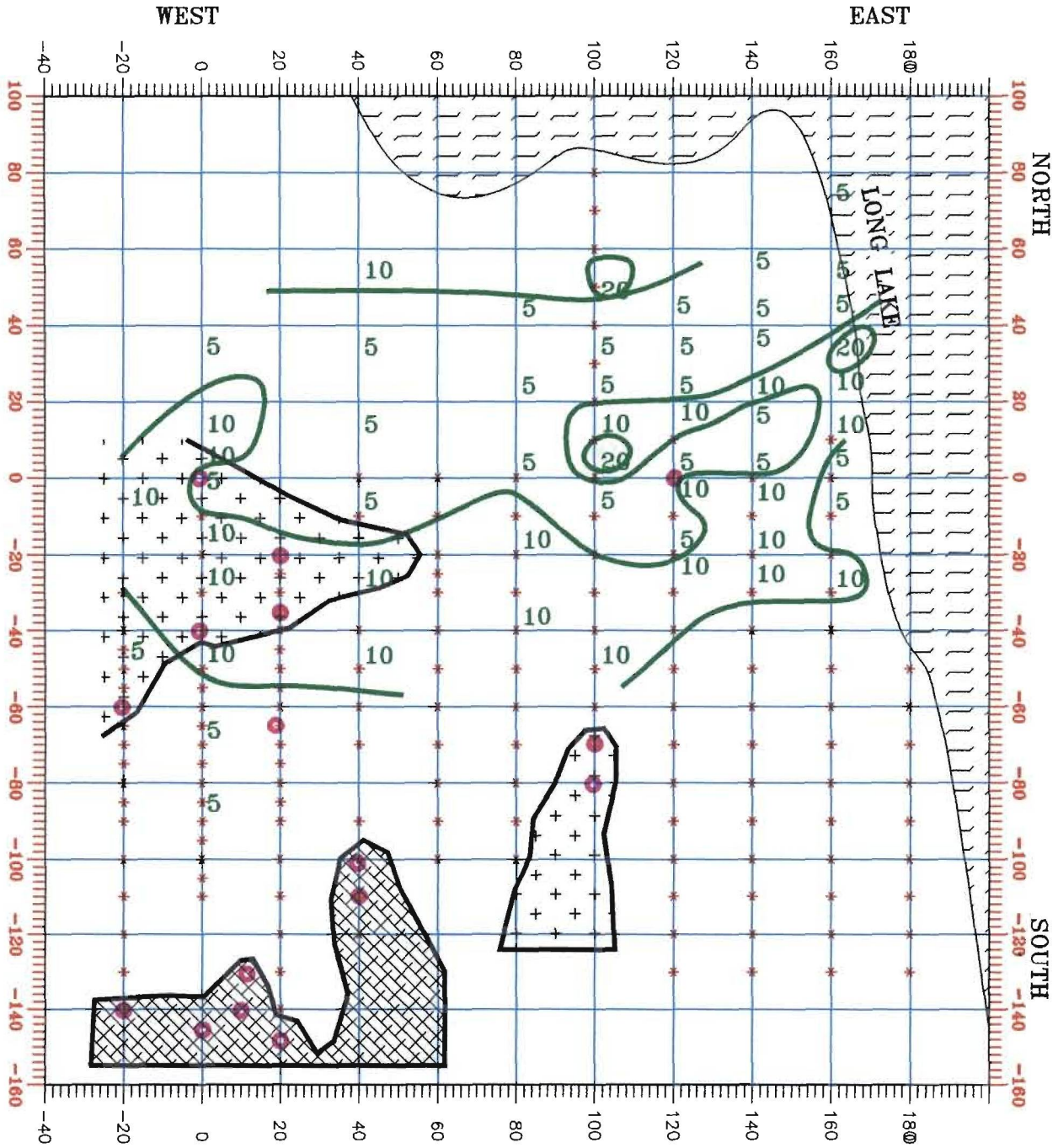
Figure 37



WHITEROCK NORTH
GEOCHEMICAL SOIL PILOT SURVEY

Mo – ppm

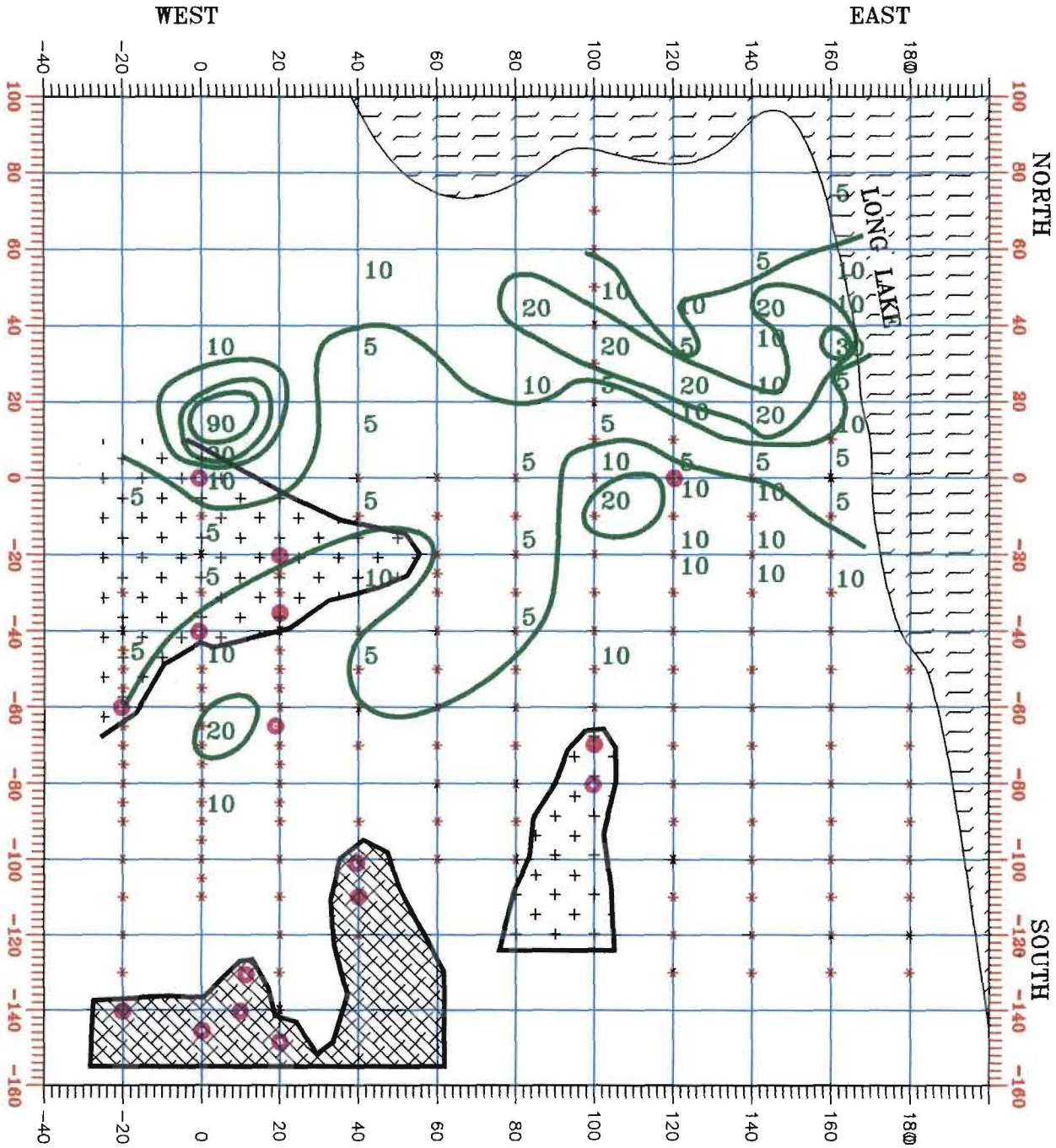
Figure 38



WHITEROCK NORTH
GEOCHEMICAL SOIL PILOT SURVEY

Ni – ppm (x10)

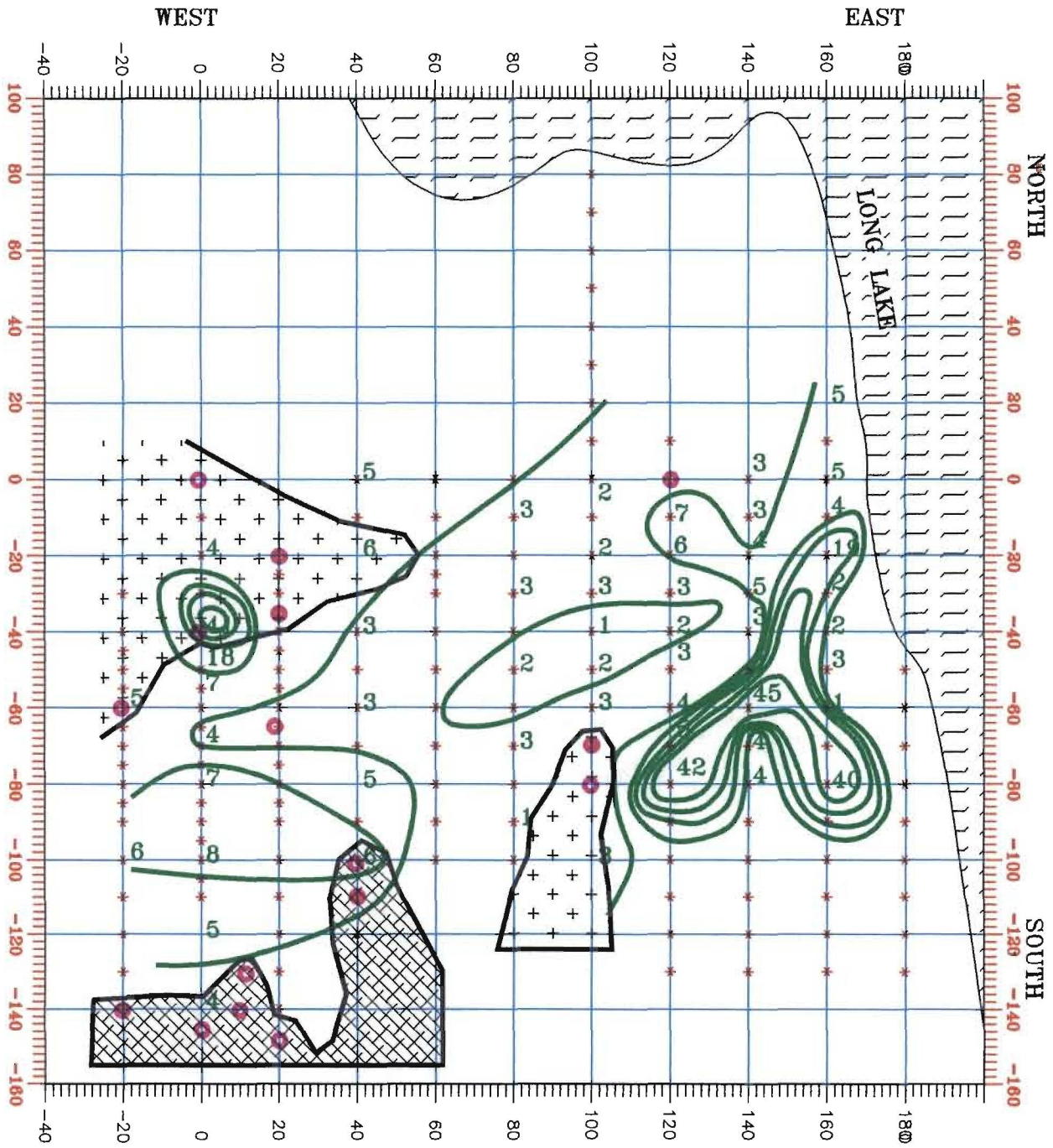
Figure 39



WHITEROCK NORTH
GEOCHEMICAL SOIL PILOT SURVEY

Pb - ppm (x10)

Figure 40



WHITEROCK NORTH
GEOCHEMICAL SOIL PILOT SURVEY

Zn – ppm

PLATES

Figure 1 Intense banding in potassic gneiss. South of Whiterock

Figure 2 Typical pink, very moderately gneissic, somewhat porphyroblastic, potassic gneissic granite. North of Whiterock.

Figure 3 Pink potassic gneiss with well developed augen fabric and remnant mafic banding. Whiterock North.

Figure 4 Contact of white, albitized gneiss in the south (left) and original unbleached, potassic gneiss in the north (right). West of Whiterock.

Figure 5 Bleached albitized gneiss showing well preserved remnant structures - Whiterock.

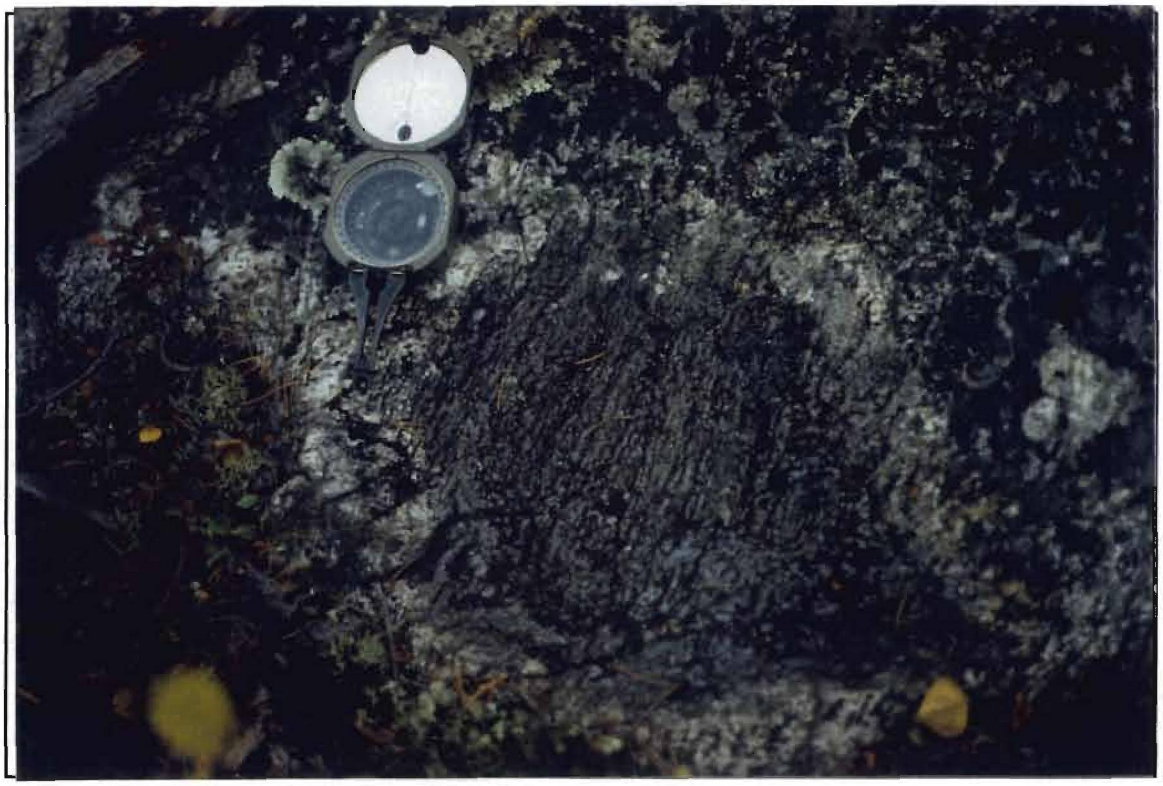


Figure 6 Serpentenized mafic inclusion in albitized gneiss - Whiterock.

Figure 7 Blebs of oxide after sulphide, albitized gneiss. Whiterock.

Figure 8 Oxide after sulphide in albitized gneiss - Whiterock.

Figure 9 East Kick area viewed from Long Lake.

Figure 10 Quartz-feldspar vein in potassic granite - Eastkick.

APPENDICES

Richardson Sept/93

BARRINGER MAGENTA
Laboratories (Alberta) Ltd.

4200B - 10 STREET N.E.
CALGARY, ALBERTA
T2E 6K3
PHONE: (403) 250-1901

01-DEC-93
PAGE: 1 OF 7
COPY: 1 OF 2

AUTHORITY:E.J. FRIESEN

E.J. FRIESEN & ASSOCIATES
8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA T2J 5B5

WORK ORDER: 9186D-93

*** FINAL REPORT ***

GEOCHEMICAL LABORATORY REPORT

SAMPLE TYPE: SOIL

SAMPLE NUMBER	AS PPM	CO PPM	CU PPM	FE %
20W 60S	<0.2	<1.0	<1.0	<0.01
20W 100S	<0.2	<1.0	1.0	<0.01
00E 20S	<0.2	1.0	1.0	0.05
00E 40S	1.0	<1.0	8.0	1.9
00E 50S	0.3	1.0	3.0	0.6
00E 55S	<0.2	<1.0	5.0	0.05
00E 70S	<0.2	1.0	2.0	0.05
00E 80S	<0.2	1.0	3.0	<0.01
00E 100S	<0.2	1.0	1.0	0.05
00E 120S	<0.2	<1.0	1.0	<0.01
00E 140S	<0.2	<1.0	<1.0	<0.01
40E 00S	<0.2	<1.0	1.0	0.05
40E 20S	<0.2	1.0	1.0	0.1
40E 40S	<0.2	1.0	2.0	<0.01
40E 60S	<0.2	1.0	1.0	0.05
40E 80S	<0.2	1.0	2.0	<0.01
40E 100S	<0.2	<1.0	1.0	<0.01
80E 10S	<0.2	<1.0	1.0	0.05
80E 30S	0.2	1.0	1.0	0.05
80E 50S	<0.2	<1.0	1.0	<0.01
80E 70S	<0.2	<1.0	2.0	0.1
80E 90S	<0.2	1.0	1.0	0.05
100E 5S	<0.2	1.0	1.0	0.1
100E 20S	<0.2	1.0	1.0	0.1
100E 30S	0.2	<1.0	2.0	0.05
100E 40S	<0.2	1.0	<1.0	0.1
100E 50S	<0.2	1.0	1.0	0.05
100E 60S	<0.2	1.0	1.0	<0.01
100E 100S	<0.2	<1.0	2.0	<0.01
120E 10S	0.2	1.0	1.0	0.2

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8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA T2J 5B5

WORK ORDER: 9186D-93

*** FINAL REPORT ***

GEOCHEMICAL LABORATORY REPORT

SAMPLE TYPE: SOIL

SAMPLE NUMBER	AS PPM	CO PPM	CU PPM	FE %
120E 20S	<0.2	<1.0	<1.0	0.1
120E 30S	<0.2	<1.0	<1.0	<0.01
120E 40S	<0.2	<1.0	1.0	0.25
120E 50S	<0.2	1.0	1.0	0.05
120E 60S	<0.2	1.0	<1.0	<0.01
120E 70S	<0.2	2.0	2.0	0.1
120E 80S	0.2	1.0	10.0	0.2
140E 00S	<0.2	<1.0	1.0	0.05
140E 10S	<0.2	1.0	2.0	0.05
140E 20S	<0.2	<1.0	1.0	0.1
140E 30S	<0.2	<1.0	1.0	0.15
140E 40S	<0.2	<1.0	3.0	0.1
140E 50S	0.2	1.0	4.0	0.1
140E 60S	0.4	1.0	11.0	0.3
140E 70S	<0.2	1.0	2.0	<0.01
140E 80S	<0.2	<1.0	2.0	0.05
160E 20N	0.3	<1.0	1.0	<0.01
160E 00S	<0.2	1.0	2.0	0.15
160E 10S	<0.2	<1.0	2.0	0.1
160E 20S	0.3	1.0	12.0	0.75
160E 30S	<0.2	<1.0	1.0	<0.01
160E 40S	<0.2	<1.0	2.0	0.05
160E 50S	<0.2	<1.0	3.0	0.05
160E 60S	<0.2	<1.0	3.0	<0.01
160E 80S	0.2	<1.0	5.0	0.15

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GEOCHEMICAL LABORATORY REPORT

SAMPLE TYPE: SOIL

SAMPLE NUMBER	PB PPM	MN PPM	MO PPM	NI PPM
20W 60S	<1.0	10.0	1.0	1.0
20W 100S	<1.0	8.0	<1.0	<1.0
00E 20S	1.0	7.0	1.0	<1.0
00E 40S	9.0	64.0	5.0	1.0
00E 50S	3.0	19.0	3.0	1.0
00E 55S	1.0	14.0	2.0	<1.0
00E 70S	<1.0	16.0	1.0	1.0
00E 80S	<1.0	11.0	2.0	1.0
00E 100S	1.0	6.0	2.0	1.0
00E 120S	2.0	7.0	1.0	<1.0
00E 140S	1.0	6.0	2.0	<1.0
40E 00S	1.0	8.0	1.0	1.0
40E 20S	<1.0	<5.0	<1.0	<1.0
40E 40S	<1.0	7.0	2.0	<1.0
40E 60S	<1.0	6.0	<1.0	<1.0
40E 80S	1.0	9.0	1.0	1.0
40E 100S	<1.0	7.0	1.0	1.0
80E 10S	2.0	7.0	1.0	<1.0
80E 30S	1.0	8.0	1.0	<1.0
80E 50S	<1.0	6.0	2.0	<1.0
80E 70S	<1.0	11.0	<1.0	1.0
80E 90S	<1.0	9.0	1.0	1.0
100E 5S	1.0	12.0	2.0	2.0
100E 20S	2.0	7.0	2.0	<1.0
100E 30S	<1.0	8.0	1.0	<1.0
100E 40S	<1.0	13.0	3.0	1.0
100E 50S	1.0	6.0	1.0	2.0
100E 60S	2.0	5.0	<1.0	<1.0
100E 100S	1.0	8.0	1.0	1.0
120E 10S	1.0	18.0	2.0	<1.0

BARRINGER MAGENTA
Laboratories (Alberta) Ltd.

4200B - 10 STREET N.E.
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PAGE: 4 OF 7
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AUTHORITY:E.J. FRIESEN

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8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA T2J 5B5

WORK ORDER: 9186D-93

*** FINAL REPORT ***

GEOCHEMICAL LABORATORY REPORT

SAMPLE TYPE: SOIL

SAMPLE NUMBER	PB PPM	MN PPM	MO PPM	NI PPM
120E 20S	<1.0	14.0	2.0	<1.0
120E 30S	2.0	6.0	1.0	<1.0
120E 40S	1.0	9.0	2.0	1.0
120E 50S	<1.0	8.0	1.0	<1.0
120E 60S	1.0	7.0	2.0	1.0
120E 70S	1.0	8.0	1.0	<1.0
120E 80S	1.0	12.0	2.0	1.0
140E 00S	<1.0	6.0	1.0	<1.0
140E 10S	2.0	8.0	<1.0	<1.0
140E 20S	1.0	5.0	1.0	<1.0
140E 30S	1.0	9.0	2.0	1.0
140E 40S	2.0	6.0	1.0	<1.0
140E 50S	<1.0	13.0	1.0	<1.0
140E 60S	1.0	36.0	9.0	1.0
140E 70S	1.0	5.0	1.0	1.0
140E 80S	1.0	10.0	1.0	1.0
160E 20N	<1.0	7.0	2.0	<1.0
160E 00S	1.0	11.0	3.0	<1.0
160E 10S	1.0	10.0	2.0	<1.0
160E 20S	3.0	40.0	3.0	2.0
160E 30S	<1.0	12.0	1.0	1.0
160E 40S	1.0	8.0	1.0	1.0
160E 50S	<1.0	13.0	2.0	<1.0
160E 60S	<1.0	9.0	2.0	<1.0
160E 80S	1.0	23.0	2.0	1.0

BARRINGER MAGENTA
Laboratories (Alberta) Ltd.

4200B - 10 STREET N.E.
CALGARY, ALBERTA
T2E 6K3
PHONE: (403) 250-1901

01-DEC-93
PAGE: 5 OF 7
COPY: 1 OF 2

AUTHORITY:E.J. FRIESEN

E.J. FRIESEN & ASSOCIATES
8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA T2J 5B5

WORK ORDER: 9186D-93

*** FINAL REPORT ***

GEOCHEMICAL LABORATORY REPORT

SAMPLE TYPE: SOIL

SAMPLE NUMBER	AG PPM	ZN PPM
20W 60S	0.5	5.0
20W 100S	0.4	6.0
00E 20S	0.3	4.0
00E 40S	0.4	41.0
00E 50S	0.5	18.0
00E 55S	0.2	7.0
00E 70S	0.2	4.0
00E 80S	<0.2	7.0
00E 100S	0.3	8.0
00E 120S	0.4	5.0
00E 140S	0.4	4.0
40E 00S	0.3	5.0
40E 20S	0.4	6.0
40E 40S	0.3	3.0
40E 60S	0.3	3.0
40E 80S	0.2	5.0
40E 100S	0.4	6.0
80E 10S	0.3	3.0
80E 30S	<0.2	3.0
80E 50S	0.3	2.0
80E 70S	<0.2	3.0
80E 90S	0.2	1.0
100E 5S	<0.2	2.0
100E 20S	<0.2	2.0
100E 30S	0.2	3.0
100E 40S	<0.2	1.0
100E 50S	<0.2	2.0
100E 60S	0.2	3.0
100E 100S	0.2	3.0
120E 10S	0.3	7.0

BARRINGER MAGENTA
Laboratories (Alberta) Ltd.

4200B - 10 STREET N.E.
CALGARY, ALBERTA
T2E 6K3
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01-DEC-93
PAGE: 6 OF 7
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AUTHORITY:E.J. FRIESEN

E.J. FRIESEN & ASSOCIATES
8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA T2J 5B5

WORK ORDER: 9186D-93

*** FINAL REPORT ***

GEOCHEMICAL LABORATORY REPORT

SAMPLE TYPE: SOIL

SAMPLE NUMBER	AG PPM	ZN PPM
120E 20S	0.2	6.0
120E 30S	0.2	3.0
120E 40S	<0.2	2.0
120E 50S	<0.2	3.0
120E 60S	0.2	4.0
120E 70S	0.7	5.0
120E 80S	2.3	42.0
140E 00S	0.4	3.0
140E 10S	0.4	3.0
140E 20S	0.3	4.0
140E 30S	<0.2	5.0
140E 40S	0.2	3.0
140E 50S	0.6	4.0
140E 60S	1.4	45.0
140E 70S	0.2	4.0
140E 80S	<0.2	4.0
160E 20N	0.2	5.0
160E 00S	<0.2	5.0
160E 10S	<0.2	4.0
160E 20S	1.5	19.0
160E 30S	<0.2	2.0
160E 40S	0.2	2.0
160E 50S	<0.2	3.0
160E 60S	<0.2	1.0
160E 80S	0.6	40.0

BARRINGER MAGENTA
Laboratories (Alberta) Ltd.

4200B - 10 STREET N.E.
CALGARY, ALBERTA
T2E 6K3
PHONE: (403) 250-1901

01-DEC-93
PAGE: 7 OF 7
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AUTHORITY:E.J. FRIESEN

E.J. FRIESEN & ASSOCIATES
8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA T2J 5B5

WORK ORDER: 9186D-93

*** FINAL REPORT ***

GEOCHEMICAL LABORATORY REPORT

SAMPLE TYPE: ROCK

SAMPLE NUMBER	FIRE ASSAY AU PPB
13.9.56	185.0

Quartz Vein

SIGNED: [redacted]
C. Douglas Read,
LABORATORY MANAGER

FOOTNOTES:
P=QUESTIONABLE PRECISION; A=INTERFERENCE; TR=TRACE; ND=NOT DETECTED;
IS=INSUFFICIENT SAMPLE; NA=NOT ANALYZED; MS=MISSING SAMPLE

FROM: CANTECH LABORATORIES INC.
4200B 10 ST NE CALGARY ALB.
TEL: 403-250-1901 FAX:403-250-8265

Richardson
Sept/oct 94

TO: FRIESEN & ASSOCIATES
#8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA
T2J 5B5
AUTHORITY: E. FRIESEN

**** FINAL REPORT ****
DATE : 94-11-10
FILE : CAN1026G
WORK ORDER : 9351-94

	AG PPM	AL %	AS PPM	B PPM	BA PPM	BE PPM	BI PPM	CA %	CD PPM	CO PPM	CR PPM	CU PPM	FE %	LA PPM	MG %	MN PPM	MO PPM	NA %	NI PPM	P PPM	PB PPM	SB PPM	SI %	SR PPM	TI %	V PPM	W PPM	ZN PPM
FR-1	<1	3.63	<3	180	275	3.5	<3	0.03	<.5	2	373	10	4.90	8	1.02	558	2	0.08	32	193	12	<2	0.01	5	0.66	127	2	138
FR-2	1.0	4.09	<3	194	1894	4.9	<3	1.87	1.4	9	152	15	4.76	157	0.97	388	1	2.06	15	3292	36	<2	0.02	336	1.38	68	3	142
FR-3	<1	5.30	5	182	1814	5.2	<3	2.13	1.6	13	110	15	4.98	172	1.01	541	1	2.61	17	3708	24	<2	0.02	342	1.26	65	<2	172
FR-4	<1	4.86	12	207	2028	5.2	<3	2.27	1.5	11	103	18	4.74	171	0.97	576	1	2.39	18	3324	40	<2	0.02	366	1.37	61	2	192
FR-5	<1	4.90	20	131	1194	6.2	<3	3.09	3.8	2	99	23	8.98	324	1.88	661	2	1.39	17	6232	16	<2	0.03	135	2.71	124	3	278
FR-6	<1	4.80	19	179	568	2.4	<3	0.95	1.4	2	188	11	2.52	42	0.71	462	1	2.40	22	474	40	<2	0.01	171	0.44	42	2	82
FR-7	<1	4.57	11	85	1727	5.0	<3	2.51	2.5	5	240	14	5.69	199	1.20	389	1	1.74	16	3657	36	<2	0.01	222	1.71	81	<2	181
FR-8	<1	4.70	30	253	9716	4.1	<3	3.03	3.1	9	292	21	3.64	71	3.12	677	1	0.80	202	5832	52	<2	0.06	2522	0.36	73	3	119
FR-9	<1	4.21	25	346	8617	9.5	<3	2.26	2.1	14	288	16	3.48	57	3.04	754	1	0.97	182	5687	48	<2	0.06	1779	0.39	70	12	131
FR-10	<1	5.74	24	237	8405	5.7	<3	2.65	3.8	21	379	17	4.07	96	3.65	800	1	0.61	234	7152	36	<2	0.08	1274	0.55	78	3	229
FR-11	<1	6.22	4	224	6167	6.4	<3	2.26	2.8	24	373	14	7.91	80	3.17	1229	2	1.21	165	7711	56	<2	0.08	956	0.72	81	2	543
FR-12	<1	5.19	40	154	2021	5.0	<3	2.16	1.5	14	164	19	4.79	184	0.97	318	2	2.23	15	3226	44	<2	0.03	329	1.28	63	4	166
FR-12P	1.0	5.46	19	38	945	7.5	<3	0.53	0.9	13	162	13	1.13	121	0.19	132	2	3.19	17	997	64	<2	0.01	191	0.18	11	3	52
JS-1	1.0	6.23	32	<5	2306	4.5	<3	1.02	<.5	21	115	12	4.73	63	0.87	247	2	1.77	14	3529	16	<2	0.01	221	1.16	53	2	123
MM-1	<1	5.76	18	19	862	4.0	<3	0.47	0.7	14	176	8	1.16	32	0.19	122	2	2.61	12	527	68	<2	0.01	209	0.18	8	3	52
MM-2	<1	7.35	23	82	837	1.3	<3	0.24	0.9	19	222	8	0.55	26	0.14	45	2	2.62	7	394	48	<2	0.01	140	0.01	4	2	15
MM-3	<1	6.61	22	30	607	0.9	<3	0.37	0.9	18	109	8	0.61	14	0.06	133	2	3.02	12	397	60	<2	0.01	155	0.02	3	<2	24
MM-8	<1	5.55	22	46	388	2.5	<3	0.47	0.5	17	129	8	0.33	15	0.10	64	2	3.92	14	268	24	<2	0.01	213	0.01	3	2	20
MM-9	1.0	5.80	30	11	1392	5.0	<3	1.91	1.2	11	106	20	3.92	264	0.71	310	6	2.61	13	2724	40	<2	0.01	266	1.11	43	3	142
MM-10	1.0	5.39	12	30	718	1.0	<3	0.45	0.6	7	183	9	1.13	65	0.28	167	2	2.52	5	494	56	<2	0.01	149	0.25	13	2	38
MM-11	1.0	5.67	26	27	1818	5.1	<3	1.97	1.2	13	123	16	4.26	192	0.80	370	5	2.41	10	2891	44	<2	0.01	292	1.27	54	<2	144
MM-12	<1	4.13	15	49	785	4.1	<3	0.51	1.1	4	214	9	1.50	377	0.35	246	2	3.63	14	840	60	<2	0.01	189	0.31	19	2	61
WR-1	<1	5.34	6	49	483	1.2	<3	0.26	0.7	7	204	6	0.47	27	0.08	52	3	2.81	8	259	64	<2	0.01	120	0.04	5	<2	28
WR-2	<1	5.70	25	57	739	1.7	<3	0.57	0.5	10	177	7	0.64	15	0.11	146	4	3.19	12	412	80	2	0.01	206	0.09	5	2	42
WR-3	<1	5.96	20	51	758	1.8	<3	0.42	0.6	13	258	8	0.96	47	0.13	195	4	2.67	12	410	84	2	0.01	168	0.08	5	3	58

FROM: CANTECH LABORATORIES INC.
4200B 10 ST NE CALGARY ALB.
TEL: 403-250-1901 FAX: 403-250-8265

**** FINAL REPORT ****
DATE : 94-11-10
FILE : CAN1026G
WORK ORDER : 9351-94

TO: FRIESEN & ASSOCIATES
#8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA
T2J 5B5
AUTHORITY: E. FRIESEN

	AG PPM	AL %	AS PPM	B PPM	BA PPM	BE PPM	BI PPM	CA %	CD PPM	CO PPM	CR PPM	CU PPM	FE %	LA PPM	MG %	MN PPM	MO PPM	NA %	NI PPM	P PPM	PB PPM	SB PPM	SI %	SR PPM	TI %	V PPM	W PPM	ZN PPM
WR-4	<1	4.66	8	25	560	0.9	<3	0.24	<.5	6	224	7	1.30	13	0.19	729	4	2.15	12	552	64	<2	0.01	112	0.02	4	3	45
WR-6	<1	5.70	18	36	563	1.7	<3	0.40	1.2	12	174	7	0.83	52	0.09	127	2	2.77	12	391	72	2	0.01	156	0.10	5	2	39
WR-7	<1	6.36	33	51	1592	5.7	<3	2.12	2.0	26	109	23	7.95	379	1.46	483	13	1.68	19	4575	48	3	0.02	130	1.97	93	<2	293
WR-8	<1	5.84	37	15	1586	5.0	<3	1.46	1.1	10	122	17	3.57	194	0.62	235	5	2.16	17	2214	48	<2	0.02	231	0.90	38	2	138
WSE-1	1.0	7.00	40	46	759	14.2	<3	1.91	0.7	17	118	16	5.87	243	0.93	787	7	3.16	21	3774	36	<2	0.02	231	1.45	61	<2	188
WSE-2	<1	7.68	47	15	1814	7.4	<3	2.54	1.9	18	161	18	5.25	262	0.90	636	11	2.77	13	3567	44	2	0.03	361	1.52	63	2	161
WSE-6	1.0	6.35	42	25	1786	3.5	<3	1.53	1.3	13	147	16	2.81	371	0.71	399	8	3.73	22	1642	88	<2	0.02	252	1.08	46	<2	123
WSE-7	<1	6.53	15	<5	788	1.5	<3	0.28	<.5	11	243	6	0.94	84	0.12	385	4	2.61	8	506	72	<2	0.01	149	0.06	5	2	41
WSE-8	1.0	6.12	39	<5	1746	5.4	<3	2.85	0.7	18	89	22	5.95	291	1.05	647	7	2.34	17	3435	48	11	0.02	364	1.25	74	<2	213
WSE-9	<1	2.90	<3	91	1215	1.5	<3	0.23	<.5	2	415	8	1.02	56	0.18	110	2	1.32	15	404	28	2	0.01	134	0.16	12	2	48
WSE-10	<1	6.49	34	<5	2484	5.8	<3	2.90	1.1	20	250	15	5.52	162	0.97	574	9	2.94	22	4203	48	3	0.02	425	1.68	68	5	195
WSE-11	1.0	5.51	32	25	1204	3.0	<3	0.43	<.5	11	183	10	1.16	64	0.16	110	4	3.02	15	652	60	<2	0.01	183	0.21	14	2	52
WSE-12	<1	6.49	32	<5	2348	3.7	<3	2.60	2.2	13	169	17	4.88	229	0.71	464	6	2.37	16	3002	36	<2	0.01	443	1.19	50	<2	134
WSE-14	1.0	8.33	32	<5	2294	2.2	<3	0.58	<.5	16	106	10	0.80	83	0.18	89	8	3.00	13	1496	44	<2	0.01	271	0.13	11	12	30
WSE-15	<1	7.64	49	<5	2178	6.0	<3	2.62	1.3	22	110	17	5.02	204	0.92	404	10	2.88	18	3944	36	<2	0.02	385	1.48	60	3	172
WSE-16	<1	6.28	12	<5	406	2.8	<3	0.56	<.5	12	105	8	0.82	17	0.12	229	5	3.38	12	596	60	<2	0.01	117	0.10	6	2	58
WSE-17	<1	6.42	33	<5	1844	7.2	<3	2.45	1.2	17	129	20	4.76	204	0.81	592	9	2.69	18	2981	68	<2	0.01	343	1.37	58	3	188
WSE-18	<1	7.43	49	<5	1040	13.2	<3	2.35	0.7	22	121	17	5.68	176	0.86	468	12	3.17	21	3930	28	<2	0.01	314	1.55	64	8	185
WSE-19	<1	7.89	29	<5	494	2.5	<3	0.52	<.5	20	219	8	1.04	20	0.17	176	6	2.95	14	694	60	<2	0.01	146	0.10	7	12	42
WSE-20	<1	5.59	20	<5	772	3.3	<3	0.72	<.5	10	155	11	1.33	202	0.23	152	5	3.03	16	532	64	<2	0.01	144	0.18	13	5	58
MM-4	<1	0.90	2	<5	113	0.6	<3	0.13	<.5	4	567	4	1.15	11	0.07	147	4	0.17	12	169	8	<2	0.01	45	0.05	15	2	16
MM-5	<1	1.03	<3	<5	181	0.4	<3	0.15	<.5	2	503	8	0.58	9	0.07	68	3	0.26	12	85	8	<2	0.01	41	0.09	14	4	26
MM-6	<1	1.15	<3	<5	191	0.6	<3	0.13	<.5	2	614	7	1.33	11	0.11	132	3	0.23	9	191	8	<2	0.01	50	0.12	27	4	52
MM-7	<1	2.25	3	<5	341	0.8	<3	0.17	<.5	2	311	12	1.63	14	0.15	128	3	0.68	6	482	12	<2	0.01	52	0.23	47	2	71
WR80E50S	<1	0.49	<3	<5	72	0.1	<3	0.09	<.5	2	386	6	0.37	8	0.03	37	2	0.09	1	75	20	<2	0.01	45	0.03	8	5	1

FROM: CANTECH LABORATORIES INC.
4200B 10 ST NE CALGARY ALB.
TEL: 403-250-1901 FAX: 403-250-8265

**** FINAL REPORT ****
DATE : 94-11-10
FILE : CAN1026G
WORK ORDER : 9351-94

TO: FRIESEN & ASSOCIATES
#8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA
T2J 5B5
AUTHORITY: E. FRIESEN

	AG PPM	AL %	AS PPM	B PPM	BA PPM	BE PPM	BI PPM	CA %	CD PPM	CO PPM	CR PPM	CU PPM	FE %	LA PPM	MG %	MN PPM	MO PPM	NA %	NI PPM	P PPM	PB PPM	SB PPM	SI %	SR PPM	TI %	V PPM	W PPM	ZN PPM
WR80E60S	<1	0.29	<3	<5	46	0.1	<3	0.08	<.5	2	487	5	0.40	7	0.02	31	3	0.06	4	49	4	<2	0.01	40	0.01	6	5	9
WR80E70S	<1	0.30	<3	65	49	0.2	<3	0.07	<.5	2	423	6	0.36	7	0.02	39	3	0.07	4	66	4	<2	0.01	39	0.02	6	3	15
WR80E80S1	<1	0.71	<3	<5	96	0.3	<3	0.69	<.5	2	600	7	0.59	9	0.07	48	2	0.09	1	210	4	3	0.01	46	0.05	14	7	11
WR80E80S2	<1	1.69	10	23	216	0.9	<3	1.30	<.5	2	289	16	0.62	22	0.18	53	1	0.21	9	325	4	2	0.01	60	0.14	33	12	28
WR80E80S3	<1	0.24	<3	<5	41	0.1	<3	0.07	<.5	2	508	7	0.43	7	0.03	42	2	0.05	1	57	4	<2	0.01	36	0.02	7	7	9
WR80E90S	<1	0.30	<3	<5	42	0.2	<3	0.04	<.5	2	605	5	0.46	6	0.02	35	<1	0.05	9	54	4	<2	0.01	34	0.01	6	3	4

CANTECH LABORATORIES INC.

SIGNED: [redacted]
C. DOUGLAS READ
LABORATORY MANAGER

Activation Laboratories Ltd. Work Order: 6988 Report: 6904

Sample description	AU PPB	AG PPM	AS PPM	BA PPM	BR PPM	CA %	CO PPM	CR PPM	CS PPM	FE %	HF PPM	HG PPM	IR PPB	MO PPM	NA PPM	NI PPM	RB PPM	SB PPM	SC PPM	SE PPM	SN %	SR %	TA PPM	TH PPM
1	6	<5	<2	680	<1	<1	<5	190	<2	1.07	4.8	<1	<5	<5	13400	<50	190	<0.2	3.7	<5	<0.01	<0.05	<1	16
2	10	<5	<2	1000	2	7	<5	180	<2	0.68	1.5	<1	<5	<5	3070	<50	190	<0.2	10	<5	<0.01	<0.05	<1	3.0
3	<5	<5	<2	520	<1	<1	<5	660	<2	0.64	<1	<1	<5	<5	21500	<50	160	<0.2	0.4	<5	<0.01	<0.05	<1	0.9
4	7	<5	<2	880	2	<1	<5	340	<2	0.93	1.7	<1	<5	<5	22300	<50	120	<0.2	1.4	<5	<0.01	<0.05	<1	27
5	10	7	<2	860	<1	<1	<5	280	<2	0.82	3.9	<1	<5	10	31300	<50	140	<0.2	2.7	<5	<0.01	<0.05	<1	8.2
6	<5	<5	<2	420	<1	<1	<5	140	<2	2.42	26	<1	<5	<5	71800	<52	<30	<0.2	5.9	<5	<0.01	<0.05	<1	220
7	14	<5	<2	2400	<1	<2	14	120	<2	6.66	52	<1	<5	<5	26000	<70	370	<0.2	11	<5	<0.01	<0.05	<1	91
8	15	<5	<2	1200	<1	3	<5	290	<2	0.79	3.9	<1	<5	<5	26000	<50	190	<0.2	2.3	<5	<0.01	<0.05	<1	11
9	<5	<5	<2	2100	<1	<1	9	300	<2	3.82	32	<1	<6	<5	18900	<51	220	<0.2	5.5	<5	<0.02	<0.05	<1	120
10	8	<5	<2	1200	<1	<1	<5	190	<2	0.65	5.4	<1	<5	<5	35400	<50	170	<0.2	3.0	<5	<0.01	<0.05	<1	8.9
11	<5	<5	<2	890	<1	<1	<5	300	<2	1.67	2.7	<1	<5	10	32000	<50	110	<0.2	21	<5	<0.01	<0.05	<1	3.4
12	<5	<5	<2	1100	<1	<1	<5	240	2	0.85	4.6	<1	<5	<5	37000	<50	180	<0.2	5.4	<5	<0.01	<0.05	<1	6.6
13	<5	<5	<2	340	<1	<1	<5	530	<2	0.50	<0.5	<1	<5	<5	<500	<50	<30	<0.2	0.2	<5	<0.01	<0.05	<1	21
14	32	<5	3	190	<1	2	<5	370	<2	0.54	2.0	<1	<5	7	19100	<50	110	<0.2	1.8	<5	<0.01	<0.05	7	4.9
14A	<5	<5	<2	630	<1	<1	<5	330	3	1.64	<1	<1	<5	8	3990	<50	1000	<0.2	1.6	<5	<0.02	<0.05	<1	<0.5
15	9	<5	<2	940	<1	<1	<5	260	<2	0.75	2.2	<1	<5	<5	28700	<50	190	0.2	3.4	<5	<0.01	<0.05	<1	5.2
16	<5	<5	<2	700	<1	2	<5	240	<2	1.55	1.5	<1	<5	<5	27700	<50	250	<0.2	18	<5	<0.01	<0.05	<1	1.6
16A	31	<5	<2	700	<1	<1	<5	270	<2	2.50	8.8	<1	<5	<5	42500	<50	86	<0.2	7.8	<5	<0.01	<0.05	<1	50
17	9	<5	<2	<100	<1	<1	<5	470	<2	0.42	<0.5	<1	<5	<5	<500	<50	<30	<0.2	0.1	<5	<0.01	<0.05	<1	0.5
18	<5	<5	<2	1100	<1	<1	<5	250	<2	0.35	1.4	<1	<5	<5	31300	<50	190	0.2	0.4	<5	<0.01	<0.05	<1	4.6
19	<5	<5	3	1000	<1	1	<5	320	<2	1.03	3.9	<1	<5	<5	39500	<50	240	<0.2	6.5	<5	<0.01	<0.05	<1	7.1
20A	1330	<5	<2	2200	<1	3	10	110	<2	6.02	50	<1	<5	25	28000	<66	250	<0.2	9.4	<5	<0.01	<0.05	<1	150
20B	<5	<5	<2	1900	<1	<1	<5	240	<2	1.47	8.3	<1	<5	<5	25100	<50	250	0.3	2.2	<5	<0.01	<0.05	<1	43
60E 30S	43	<5	<2	110	2	<1	<5	350	<2	0.42	2.4	<1	<5	<5	1140	<50	<30	0.2	0.7	<5	<0.01	<0.05	<1	2.9
60E 60S	<5	<5	3	<100	2	<1	<5	550	<2	0.63	2.2	<1	<5	6	1100	<50	<30	<0.2	0.6	<5	<0.01	<0.05	<1	2.0
60E 80S	184	<5	3	<100	2	<1	<5	540	<2	0.54	2.3	<1	<5	<5	998	<50	<30	0.3	0.6	<5	<0.01	<0.05	<1	2.5
21	9	<5	<2	1500	<1	<1	<5	210	<2	0.83	2.0	<1	<5	<5	23500	<50	190	<0.2	0.5	<5	<0.01	<0.05	<1	2.2

[redacted]

July 1 Aug 94

Activation Laboratories Ltd. Work Order: 6988 Report: 6904

Sample description	U PPM	W PPM	ZN PPM	LA PPM	CE PPM	ND PPM	SM PPM	EU PPM	TB PPM	YB PPM	LU PPM	Mass g
1	11	<4	<50	28	64	16	4.5	0.8	<0.5	1.18	0.23	10.00
2	0.8	<4	85	27	68	29	4.0	1.2	<0.5	1.37	0.20	10.00
3	<0.5	<4	<50	8	16	<5	0.6	0.4	<0.5	0.41	<0.05	4.749
4	3.2	<4	<50	37	100	27	3.4	0.4	<0.5	0.46	0.07	10.00
5	12	<4	<50	22	45	19	3.1	0.8	<0.5	1.46	0.27	10.00
6	12	<4	<50	50	110	40	7.3	1.4	<0.5	4.81	0.62	10.00
7	2.8	<4	160	330	750	310	37	4.1	<0.5	1.82	0.44	10.00
8	5.3	<4	<50	16	32	10	1.5	1.0	<0.5	1.04	0.18	10.00
9	<0.5	<4	140	260	510	210	24	2.8	<0.5	2.15	0.08	4.947
10	11	<4	<50	30	69	16	3.9	0.9	<0.5	1.33	0.26	10.00
11	3.3	<4	<50	15	36	6	1.4	0.6	<0.5	14.0	2.42	10.00
12	6.7	<4	<50	18	40	16	2.5	0.6	1.3	2.28	0.39	10.00
13	<0.5	<4	<50	27	73	22	1.9	0.2	<0.5	<0.05	<0.05	10.00
14	9.0	<4	<50	4	18	<5	1.2	0.3	<0.5	7.36	1.17	10.00
14A	<0.5	<4	94	<1	<3	<5	0.1	<0.2	<0.5	<0.06	<0.05	1.978
15	9.7	<4	<50	12	27	11	1.2	0.3	<0.5	2.33	0.48	10.00
16	2.0	<4	<50	14	34	<5	0.9	0.3	<0.5	10.0	1.80	10.00
16A	5.1	<4	138	98	200	70	12	2.1	<0.5	6.04	1.05	10.00
17	<0.5	<4	<50	1	<3	<5	0.1	<0.2	<0.5	<0.05	<0.05	10.00
18	4.1	<4	<50	11	25	7	1.3	0.6	<0.5	0.56	0.07	10.00
19	6.6	<4	<50	25	51	15	2.7	0.6	<0.5	2.53	0.37	10.00
20A	5.9	<4	228	340	760	290	33	3.9	<0.5	2.76	0.32	10.00
20B	17	<4	114	78	190	79	8.8	1.3	<0.5	1.06	0.10	10.00
60E 30S	1.3	<4	<50	10	19	10	1.3	0.4	<0.5	0.51	0.06	10.00
60E 60S	<0.5	<4	<50	9	17	8	1.3	0.3	<0.5	0.60	0.10	10.00
60E 80S	1.5	<4	52	9	18	6	1.1	0.2	<0.5	0.43	0.10	10.00
21	<0.5	<4	<50	19	41	11	1.3	1.2	<0.5	0.23	<0.05	10.00

BARRINGER
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14-MAR-94
PAGE: 1 OF 1
COPY: 2 OF 2

AUTHORITY:E.J. FRIESEN

E.J. FRIESEN & ASSOCIATES
8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA T2J 5B5

WORK ORDER: 9232D-94

*** FINAL REPORT ***

GEOCHEMICAL LABORATORY REPORT

SAMPLE TYPE: ROCK

SAMPLE NUMBER		ROCK #1
Gold FA	-ppb	10.0
Silver	-ppm	0.05
Arsenic	-ppm	25.0
Cobalt	-ppm	1.0
Copper	-ppm	8.0
Iron	- %	0.6
Manganese	-ppm	59.0
Molybdenum	-ppm	3.0
Nickel	-ppm	1.0
Zinc	-ppm	35.0
Lead	-ppm	58.0

SIGNED: [redacted]
C. Douglas Read,
LABORATORY MANAGER

White Rock
Richardson

FOOTNOTES:
P=QUESTIONABLE PRECISION; *=INTERFERENCE; TR=TRACE; ND=NOT DETECTED;
IS=INSUFFICIENT SAMPLE; NA=NOT ANALYZED; MS=MISSING SAMPLE

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Richardson
Sept/Oct 94

21-OCT-94
PAGE: 1 OF 2
COPY: 1 OF 2

AUTHORITY: Ed Friesen

E.J. FRIESEN & ASSOCIATES INC.
#8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA
T2J 5B5

WORK ORDER: 9351-94
*** FINAL REPORT ***

ANALYTICAL LABORATORY REPORT

SAMPLE TYPE: ROCK

SAMPLE NUMBER	Au ppb	Rh ppb	SAMPLE NUMBER	Au ppb	Rh ppb
FR-1	6	<30	MM-11	9	<30
FR-2	5	<30	MM-12	10	<30
FR-3	12	<30	WR-1	11	<30
FR-4	8	<30	WR-2	8	30
FR-5	6	<30	WR-3	12	<30
FR-6	3	<30	WR-4	17	<30
FR-7	8	<30	WR-6	6	<30
FR-8	9	<30	WR-7	7	<30
FR-9	7	<30	WR-8	18	<30
FR-10	11	<30	WSE-1	10	<30
FR-11	7	<30	WSE-2	8	<30
FR-12	10	<30	WSE-6	16	<30
FR-(12P)	8	<30	WSE-7	9	<30
JS-1	12	<30	WSE-8	8	30
MM-1	10	<30	WSE-9	10	<30
MM-2	7	<30	WSE-10	7	<30
MM-3	7	30	WSE-11	4	<30
MM-8	4	<30	WSE-12	8	<30
MM-9	7	<30	WSE-14	8	<30
MM-10	5	<30	WSE-15	6	<30
			WSE-16	9	<30
			WSE-17	11	<30
			WSE-18	7	<30
			WSE-19	19	30
			WSE-20	10	<30

SIGNED: [redacted]
Richard Magner,
LABORATORY TECHNOLOGIST

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Richardson
Sept 1/Oct 94

21-OCT-94

COPY: 1 OF 2

AUTHORITY: Ed Friesen

E.J. FRIESEN & ASSOCIATES INC.
#8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA
T2J 5B5

WORK ORDER: 9351-94
*** FINAL REPORT ***

ANALYTICAL LABORATORY REPORT

SAMPLE TYPE: SOIL

SAMPLE NUMBER	Au ppb	Rh ppb
MM-4	4	<30
MM-5	6	<30
MM-6	<2	<30
MM-7	3	<30
WR 80E 50 S	12	<30
WR 80E 60 S	10	<30
WR 80E 70 S	13	<30
WR 80E 80 S#1	2	<30
WR 80E 80 S#2	5	<30
WR 80E 80 S#3	13	<30
WR 80E 90 S	8	<30

SIGNED: [redacted]
Richard Magner,
LABORATORY TECHNOLOGIST

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15-NOV-94
PAGE: 1 OF 1
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AUTHORITY:E. FREISEN

E.J. FRIESEN & ASSOCIATES
8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA T2J 5B5

WORK ORDER: 93660-94

*** FINAL REPORT ***

GEOCHEMICAL LABORATORY REPORT

SAMPLE TYPE: ROCK CHIP

SAMPLE NUMBER	FIRE ASSAY AU PPB
BLACK ONLY	4.0
#1 BLACK	5.0
#2 PINK	6.0

Sept/Oct 94 Mt. Walter

Sensitivity } amphibilite < 2 PPB

SIGNED: [redacted]

C. Douglas Read,
LABORATORY MANAGER

Richardson

Redo of amphibilite collected July/Aug 94 expedition on mount walter which gave earlier kick of 1330 PPB in the black.

FOOTNOTES:
P=QUESTIONABLE PRECISION; *=INTERFERENCE; TR=TRACE; ND=NOT DETECTED; IS=INSUFFICIENT SAMPLE; NA=NOT ANALYZED; MS=MISSING SAMPLE

TOTAL P.01

To: BIRCH MOUNTAIN MINERALS LTD.,
320, 555 - 4th Avenue S.W.,
Calgary, Alberta T2P 3E7

ATTN: Val Pratico

File No. 36939
Date October 20, 1994
Samples Rock

Certificate of Assay
LORING LABORATORIES LTD.

SAMPLE NO.	PPB Au	PPM Ag
Geochemical Analysis		
0313	<5	<0.1
0314	<5	<0.1
0315	<5	<0.1
0316	<5	<0.1
0317	<5	<0.1
0318	<5	0.1
0319	<5	<0.1
0320	<5	<0.1
0321	<5	<0.1

I Hereby Certify that the above results are those assays made by me upon the herein described samples....

Rejects retained one month.
Pulps retained one month
less specific arrangements
are made in advance.

[redacted]
Assayer

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28-SEP-94
PAGE: 1 OF 2
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AUTHORITY:E.J. FRIESEN

E.J. FRIESEN & ASSOCIATES
8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA T2J 5B5

WORK ORDER: 9318D-94

*** FINAL REPORT ***

GEOCHEMICAL LABORATORY REPORT

SAMPLE TYPE: ROCK CHIP

Richardson July/Aug 94

SAMPLE NUMBER	CU PPM	PB PPM
1	16.0	14.0
2	9.0	4.0
3	13.0	11.0
4	6.0	3.0
5	6.0	9.0
6	4.0	6.0
7	13.0	11.0
8	7.0	8.0
9	11.0	17.0
10	6.0	6.0
11	4.0	4.0
12	5.0	10.0
13	7.0	4.0
14	9.0	6.0
14A	8.0	3.0
15	4.0	7.0
16	4.0	9.0
16A	16.0	28.0
17	5.0	<1.0
18	4.0	8.0
19	5.0	8.0
20A	57.0	400.0
20B	10.0	34.0
60E 30S	9.0	11.0
60E 60S	7.0	1.0
60E 80S	33.0	61.0
21	6.0	1.0

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28-SEP-94

COPY: 2 OF 2

AUTHORITY: E.J. FRIESEN

E.J. FRIESEN & ASSOCIATES
8 LAKE PLACID RISE S.E.
CALGARY, ALBERTA T2J 5B5

WORK ORDER: 9318D-94

*** FINAL REPORT ***

GEOCHEMICAL LABORATORY REPORT

SAMPLE TYPE: ROCK CHIP

SAMPLE NUMBER	FIRE ASSAY AU PPB
20A	640.0
60E 30S	34.0
60E 80S	107.0

Re-do of Amphibolite from Mt Watter to check NAA readings

SIGNED: [redacted]
C. Douglas Read,
LABORATORY MANAGER

(Same sample as submitted for NAA)

FOOTNOTES:
P=QUESTIONABLE PRECISION; *=INTERFERENCE; TR=TRACE; ND=NOT DETECTED;
IS=INSUFFICIENT SAMPLE; NA=NOT ANALYZED; MS=MISSING SAMPLE

The following personnel were involved

Name and address	Position
Ed Friesen 8 Lake Placid Rise S.E. Calgary AB T2J 5B5	party chief
Adrian Mann 10443 Brackenridge Road S.W. Calgary, AB T2W 1A1	chief geologist
Justin Snelling 101 Crystalridge Dr. Okotoks, AB T0L 1T2	geologist
Rudy Friesen 16 Robinson Dr. Okotoks, AB T0L 1T2	worker
Karen Ahola 8 Lake Placid Rise S.E. Calgary AB T2J 5B5	worker

North-east Alberta Mining Claims

Expences

Richardson - Summary

Expedition No.	Description			Total
1	aerial reconnacence	Page 2 (portion)		1800
2	Sep-93	Page 3		19848.02
3	Jul-94	Page 4		14139.17
4	Sep-94	Page 5		16660.92
Office	report prep	[redacted]	[redacted]	1600
				1600
		Total		55648.11

North-east Alberta Mining Claims

Date September 6,1993

Expences

Aerial Reconnisance - September 1993

		Days	Position	Rate $ / Day	Costs
Personnel involved	[redacted]	[redacted]	pilot	[redacted]	400
			co-pilot		300
Preparation	[redacted]	[redacted]	pilot	[redacted]	800
			worker		200
			co-pilot		300
vehicle	aircraft	10 hours		$150.00	1500
	van	60 kM		$0.50	30
Equipment	video camera				50
	survival kit				100
Other	food				50
Office	[redacted]	[redacted]	project manager	[redacted]	1200
				Total	4930

Areas surveyed

Pearson
Richardson
Marguerite
Audette

North-east Alberta Mining Claims

Dates fri Sept 10 to tue Sept 14, 1993

Expences

Richardson - September 1993

		Days	Position	Rate $ / Day	Costs
Personnel involved	[redacted]	[redacted]	party chief	[redacted]	2000
			worker		2000
Preparation	[redacted]	[redacted]	party chief	[redacted]	2400
			geologist		1600
			worker		200
vehicle	van	2000 kM		$0.50	1000
	float plane				691.22
Equipment	magnetometer				256.8
	vlf				100
	scintelometer				100
Other	food				400
Office	[redacted]	[redacted]	project manager	[redacted]	3200
			geologist		3200
Office Equipment	computers, plotters, photocopy etc.				1500
Barringer Labs					1200
				Total	19848.02

North-east Alberta Mining Claims

Expences Dates wed July 27 to mon Aug 1, 1993

Richardson - July 1994

		Days	Position	Rate $ / Day	Costs
Personnel involved	[redacted]	[redacted]	party chief	[redacted]	2400
			worker		1200
Preparation			party chief		1600
			worker		400
			worker		200
vehicle	van	2000 kM		$0.50	1000
	float plane				803.03
Equipment	VLF				100
	Scintelometer				100
Other	food				400
Office	[redacted]	[redacted]	project manager	[redacted]	1600
			geologist		1600
Office equipment	computers,plotters,photocopy etc				1500
Cantech Labs					1236.14
				Total	14139.17

North-east Alberta Mining Claims

Dates Thurs Sept 29 to Tue Oct 4, 1994

Expences

Richardson - September 1994

		Days	Position	Rate $ / Day	Costs
Personnel involved	[redacted]	[redacted]	party chief	[redacted]	2400
			worker		1200
			geologist		2400
Preparation	[redacted]	[redacted]	party chief	[redacted]	1200
			worker		200
			worker		200
			geologist		400
vehicle	van	2000 kM		$0.50	1000
	float plane				1247.4
Equipment	VLF				100
	Scintelometer				100
Other	food				400
Office	[redacted]	[redacted]	project manager	[redacted]	1600
			geologist		1600
Office Equipment	computers, plotters, photocopy				1500
CanTech Labs					1113.52
				Total	16660.92