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Legend Block Government Assessment Report

Legend Block
NTS 72E and 82H

Takla Star Resources Ltd. and Fairstar Exploration

BY
D. I. SRAEGA, Geologist
EDMONTON, ALBERTA

DECEMBER, 1994

Table of Contents

Legend Block Summary

The block consists of 129000 hectares or 230,000 acres. The block lies within the townships 4 to 12, ranges 12 to 16 west of the 4th meridian. A stream sediment heavy mineral program was conducted in the fall of 1992. The geochemical sediment heavy mineral survey report for the 1992 field season is given in Appendix I and the aeromagnetic geophysical report is given Appendix II.

In the fall of 1992 a 38 sample heavy mineral program was conducted in the vicinity of Etzikom Coulee. The ground follow-up work to the reprocessing of the GSC total field geophysical data was conducted in April of 1994

A large number of Peridotitic garnets with surface textures indicating a proximal source were found along Etzikom Coulee. The predominance of peridotitic suite minerals found suggests the potential source of the indicator minerals is a kimberlite or an ultramafic lamprophyre. A prospector reportedly found two diamonds in the gravel pit near the outlet of Crow Indian Lake.

The Peridotitic G9 and G11 garnets found had orange peel textures and one garnet had a partial kelyphitic rim. The chrome diopside grains were frosted and the ilmenite surfaces pitted. The physical surface characteristics of these minerals indicate proximal source.

One sample from Chin Coulee north of Etzikom Coulee contained one indicator mineral. The majority of indicator minerals were found along Etzikom Coulee. Indicator minerals were found in samples of glaciofluvial and alluvial origin along Etzikom Coulee. A sample of alluvium, possibly derived from the preglacial Skiff Channel sediments, contained indicator minerals. An intertill unit upstream from Crow Indian Lake on Etzikom Coulee contained indicator minerals. Samples take from glacial morainal material contained few or no indicator minerals. There is evidence of four glacial advances in a southerly direction of the Laurentide ice sheet in the Foremost area (Westgate, 1968). The Etzikom Coulee is a glacial meltwater channel that flowed eastward forming terrace deposits along the channel. The predominance of indicator minerals along the east flowing Etzikom Coulee and the southerly direction of ice movement suggests a source of indicator minerals from the north or northwest.

The results of the sediment heavy mineral program prompted the undertaking of the reprocessing of the GSC aeromagnetic total field magnetics data for part of the southern portion of the block. The reprocessing of the data included total field, first and second derivative of vertical magnetic gradient and the euler deconvolution. The reprocessing determined there were 12 possible geophysical targets in an area from Etzikom Coulee to Chin Coulee. Airphoto interpretation, ERCB computer database and ground follow-up of potential targets determined there was only one anomaly not related directly to culture. This anomaly (F6n) was between two fight lines and 100 meters south of a gas pipeline and three farm buildings (refer to appendix II)

The proximal provenance indicated from the surface textures of the indicator minerals suggested a local source of indicator minerals. The reprocessed geophysical data indicated one anomaly was not related to culture. Regional total field geophysical maps indicate radial dykes radiating from the Sweetgrass Hills in northern Montana (Ross et al., 1994). These dykes may be the source of the indicator minerals along Etzikom Coulee. It is inconclusive at this time where the potential source of the indicator minerals and the diamonds is in the block.

Introduction

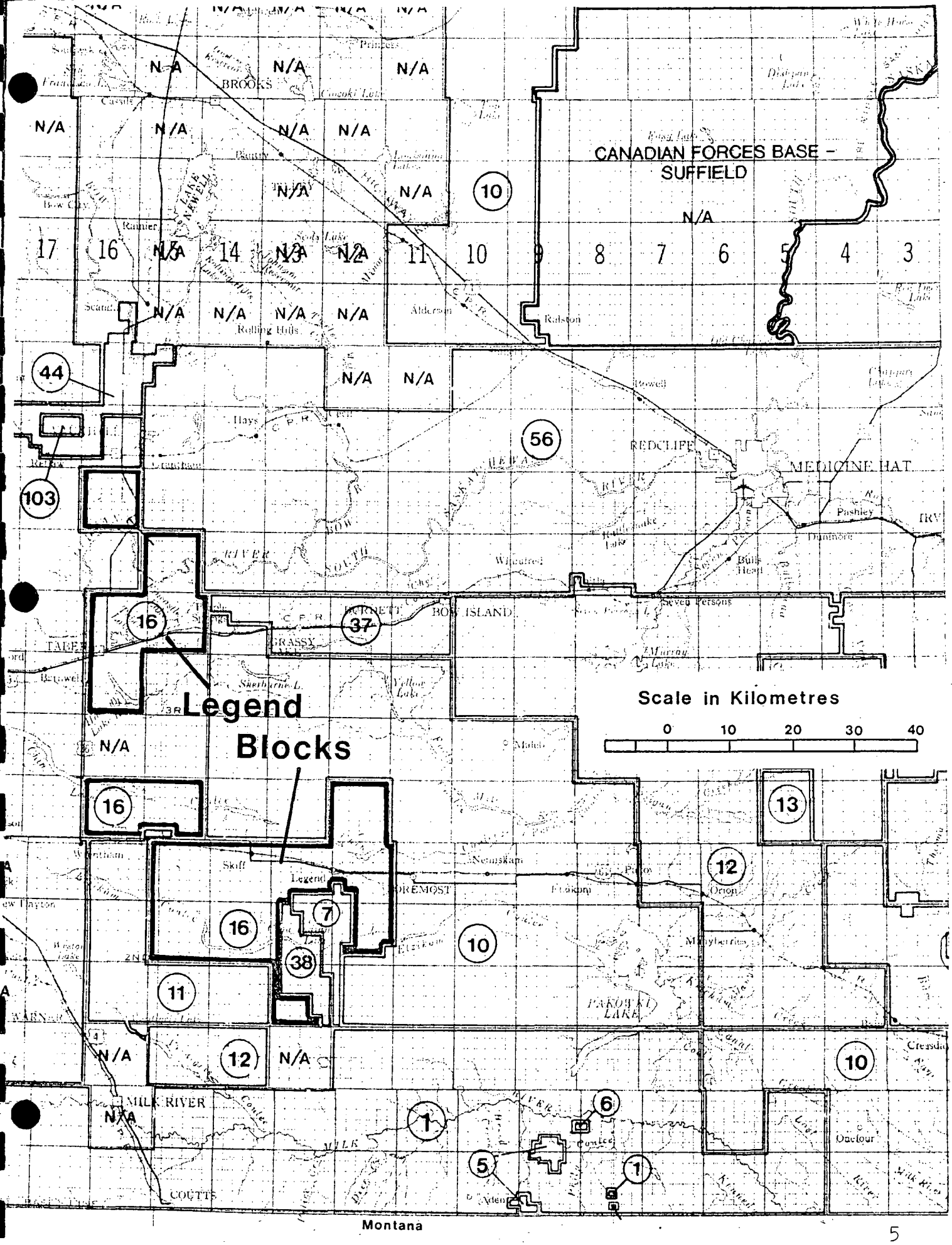
This assessment report detail the stream sediment heavy mineral program carried out in the Legend Block in the search for diamond bearing alkaline ultrabasic rock. There were 15 samples taken in the fall of 1992 in the Legend Block.

The Precambrian basement underlying the Legend Block is the Medicine Hat Block (Ross et al., 1991). The Medicine Hat Block has been dated between 2.65 and 3.27 Ga. The block is bounded to the north by the Vulcan aeromagnetic low and to the south by the Wyoming craton. The Medicine Hat Block may be the northern extension of the Wyoming craton (Luth et al., 1994). The Wyoming Craton is known to host alkaline ultrabasic diamond bearing rocks. The association of a Precambrian basement terrane spatially associated alkaline ultrabasic diamond bearing rock make the Legend Block a potential target for diamond exploration.

Location

This assessment pertains to the Legend Block. The block consists of 14 metallic and industrial permits in the Eastern Alberta Plain. The block consists of 129000 hectares or 230,000 acres. The block lies within the townships 4 to 12, ranges 12 to 16 west of the 4th meridian.

Access in the block is excellent. Highways 61 and 4 provide good access by road and range and township roads grid the area at 1 mile intervals. The area is extensively cultivated providing good access by foot.


CANADIAN FORCES BASE – SUFFIELD
N/A
BROOKS
MEDICINE HAT
REDCLIFF
BOW ISLAND
GRASSY LAKE
TABER
Legend
Blocks
Scale in Kilometres
0 10 20 30 40
MILK RIVER
COUTTS
Montana
17 16 15 14 13 12 11 10 9 8 7 6 5 4 3
44
103
56
37
16
13
12
10
11
38
7
6
5
1

Permit Tabulation

The permit holder of the metallic and industrial mineral permits which comprise the Legend Block is held by Takla Star Resources Ltd. This assessment report is submitted by Takla Star Resources Ltd. and authored by Douglas I. Sraega. G.I.T. The list of permits, which comprise the Legend Block, is given below with amount of money allocated to the permit. The described lands are to be retained for 6 years with expenditures in excess of $25 per hectare on retained lands The list of permits, which comprise the Legend Block, is given below with amount of money spent on exploration per permit. At the current time the block is a joint venture between Takla Star Resources Ltd. 75% and Fairstar Exploration 25%. The description of the tracts of lands pertaining to each permit is given in Appendix II. The statement of expenditures in given in appendix III

Permit Number	Amount of Money Spent in Permit
9393030557	$0.0
9393030558	$0.0
9393030559	$17,740.44
9393030560	$0.0
9393030561	$0.0
9393030562	$0.0
9393030563	$0.0
9393030564	$0.0
9393030675	$0.0
9393030676	$0.0
9393030677	$0.0
9393030678	$0.0
9393030679	$0.0
9393030680	$0.0

The list of metallic and industrial mineral permit numbers with the locations to be retained by Takla Star Resources.

Permit Number	Description of Lands to be Retained
9393030557	-
9393030558	-
9393030559	4-14-5: 29: L 5-7, L 10-12, L 13-15; 30 L 6-11, L 14-16; 31 L 1-3, L 6-11; 32 L 2-3, L 5-7, L 10-12
9393030560	-
9393030561	-
9393030562	-
9393030563	-
9393030564	-
9393030675	-
9393030676	-
9393030677	-

9393030678 -
9393030679 -
9393030680 -

Work Performed

A stream sediment heavy mineral program was conducted in the fall of 1992. The geochemical sediment heavy mineral survey report for the 1992 field season is given in Appendix I and the aeromagnetic geophysical report is given Appendix II.

Field Work	Dates
Stream Sediment Heavy Mineral Program	September 1 to 25, 1992
Geophysical Ground Follow-up	April 25 to 30, 1994

Conclusions

In the fall of 1992 a 38 sample heavy mineral program was conducted in the vicinity of Etzikom Coulee. The ground follow-up work to the reprocessing of the GSC total field geophysical data was conducted in April of 1994

A large number of Peridotitic garnets with surface textures indicating a proximal source were found along Etzikom Coulee. The predominance of peridotitic suite minerals found suggests the potential source of the indicator minerals is a kimberlite or an ultramafic lamprophyre. A prospector reportedly found two diamonds in the gravel pit near the outlet of Crow Indian Lake.

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References

Luth R. C., Creaser R. A., Covell P. A. and Buhlman A. L., 1994, Lower crustal xenoliths of the Sweetgrass hills: preliminary findings. In Ross G. M., (editor), 1994, Alberta basement transects workshop (February 14-15), Lithoprobe Report #37, Lithoprobe Secretariat, University of British Columbia, pages 240-249

Dawson J. B. and Stephen W. E., 1975, Statistical classification of garnets from kimberlite and associated xenoliths. Journal of Geology, vol. 83, pages 589-607.

GSC Map 2588, Aeromagnetic Total Field Map, NTS 72E SW, scale 10000.

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Statement of Qualification

I, Douglas I. Sraega of [redacted] Edmonton , Alberta do hereby certify that.

1.) I am a graduate of the University of Alberta, Edmonton with a B.Sc. in Science obtained in 1987.

2.) I have completed a Special Certificate in Geology from the University of Alberta obtained in 1993.

3.) I am the author, except for the statement of expenditures, of this report.

Certified [redacted] Data Dec 16. 1994

Appendix I

Report on the 1993 Stream Sediment Heavy Mineral Geochemistry Survey of the Legend Block

REPORT ON THE 1993 STREAM SEDIMENT HEAVY MINERAL GEOCHEMISTRY SURVEY

ON THE

LEGEND BLOCK
ALBERTA
NTS 72E and 82H

Prepared for

TAKLA STAR RESOURCES LTD.

BY

D.I. SRAEGA, Geologist
EDMONTON ALBERTA

FEBUARY 1994

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Figure 1: Indicator Minerals

Executive Summary

General

A sediment geochemistry program was carried out on the Legend Block during the fall of 1992. The object of the program was to sample glacial drift and alluvium primarily along or adjacent to Etzikom Coulee and Chin Coulee to assess the potential for diamondiferous source rocks.

Results

A large number peridotitic garnets with surface textures indicating a proximal source were found. The large number of peridotitic suite of minerals found suggests the source the potential primary source rock is kimberlite. The presence of microdiamonds indicates the potential source rock is diamondiferous.

Samples taken along the east flowing Etzikom Coulee and meltwater channels to the north of the channel contain indicator minerals. Samples taken from Chin Coulee 20 km north of Etzikom Coulee were barren. One sample of glacial outwash proximal to the north flowing preglacial Skiff drainage north of Chin Coulee contained indicator minerals. This suggests potential primary source rocks exists north and northwest of Etzikom Coulee. This is coincident with aeromagnetic anomalies north and northwest of Etzikom Coulee.

Recomendations

The results to date indicate at least one primary source rock may exist in the northwest corner of the Legend Block. Tightly spaced ground aeromagnetic survey should be conducted in the northwest and north of Etzikom Coulee coincident with aeromagnetic survey to define potential drilling targets.

1 Introduction

This report describes the results of a heavy mineral stream geochemistry program carried out on the Legend Block during the fall of 1992. The object of the program was to sample glacial drift and alluvium primarily along or adjacent to Etzikom Coulee and Chin Coulee to assess the potential for diamondiferous source rocks.

Kimberlites and lamproites are the primary source of diamond. Diamondiferous kimberlites are found in deep Archean cratons and lamproites with paleobenioff zones in mobile belts. Diatreme clusters and fields lie along linears controlled by deep crustal fractures. The Legend Block lies over the Archean Medicine Hat Block which has been interpreted as the northern extension of the Wyoming craton. Diamondiferous kimberlites are found in the Wyoming craton along the Colorado-Wyoming border.

2 Location, Access and Physiography

2.1 Location

The Legend Block lies 60 km east of Lethbridge Alberta and comprises 83879 hectares or nine mineral applications. The block is bounded by range 13 to 16 west of the 4th meridian and between the 4th and 7th township and includes 9 townships (T4-7,R13-16W4). Small agricultural communities of Legend and Skiff lie within the claim block. The Etzikom Coulee flows west through the southern portion of the block and Crow Indian Lake lies within the coulee. Chin Coulee cuts through the northern portion of the block.

2.2 Physiography and Access

The area is predominantly agricultural with excellent road access by highway and secondary road. The block is part of the Eastern Alberta Plain with rolling to undulating hills and incised drainages. Wheat and barley are the main agricultural crops with praire grasses the dominant vegetation on uncultivated land. Lodgepole pine, popular and spruce are found on the north side of the coulees. Access is excellent with highways 61 and 4, township and range roads.

The elevation in the Legend Block area averages 900m in the plains and the Chin and Etzikom coulees are incised up to 60m below the surrounding plain.

Southern Alberta is divided into three drainage systems. The Oldman River is part of the Nelson drainage to Hudson Bay and the Milk River, near the Montana border, is part of the Missouri drainage system. The Pakowki drainage basin lies between the Nelson and Missouri drainages and includes Etzikom Coulee (Westgate,1968). It is an enclosed drainage encompasing almost the entire block.

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3 Regional Geology

The Precambrian basement underlying the Legend study area is the Medicine Hat Block (Ross et al.,1991) dated between 2.65 and 3.27 Ga. The 1.8 Great Fall Tectonic Zone separates the Wyoming craton from the Medicine Hat Block. The block is bounded to the north by the Vulcan aeromagnetic low which is interpreted to be an aulocogen or a collision suture (Ross et al.,1991).

The sedimentary strata include Cambrian, Devonian and Cretacous strata. Cambrian siliciclastic, carbonate and red beds are uncomformably overlain by Devonian platform and reefal corbonates and shales. The Cretaceous Foremost Formation of the Belly River Group subcrops in the entire area. To the east a complete stratigraphic sequence in the Cypress Hills indicates the study area has been extensively eroded during the Tertiary (Westgate,1968).

Surficial deposits range in depth from 50 ft to 100 ft except in the talwegs of buried preglacial channels which can exceed 200 ft in depth. The preglacial Skiff channel runs north through Skiff east Legend (Westgate,1968). Glacial landforms include both dead and active ice features. Dead ice features include end , washboard, hummocky and disintegration moraine and eskers. Active ice features include drumlins and flutings. Proglacial landforms include outwash plains, meltwater channels, glaciolacustrine deposits and outwash spillways. The Chin and Etzikom Coulees are glacial meltwater channels. There is evidence in the area of four glacial advances of the Laurentide ice sheet in the Foremost area (Westgate, 1968) with ice directions south to southeast. The Etzikom and Chin Coulees drained glacial meltwater east and terraces along the Etzikom show evidence of at least two glacial advances.

4 Exploration Program

All samples were collected from natural or man made exposures that are easily accessible by truck. Well sorted glaciofluvial material was sieved to -4mm whiel poorly sorted diamictons and till samples were not sieved. Each sample weighed from 25 to 30 kg. Field samples were sent to SRC for processing. Picked mineral grains were sent to the University of Saskatchewan for microprobe analysis.

A total of 17 samples; 8 till, 7 glaciofluvial, 1 alluvial and one of uncertain origin were taken in this study. Thirteen samples were taken from the Etzikom Coulee and four were taken form Chin Coulee 25 km north of Etzikom Coulee. The garnets were classified according to Dawson and Stephen (1975) and clinopyroxenes according to Stephen and Dawson (1977). A summary of field notes and locations of sample sites is listed in Appendix 10.1 and electron microprobe analysis in Appendix 10.2.

5 Discussion of Indicator Minerals

Indicator minerals are minerals which indicate to the presence of a lamproite or kimberlite intrusion or the potential for diamond in an intrusion. These minerals are characteristic of phases found in kimberlites or lamproites, the source region in the upper mantle of the rock or found as inclusions in diamonds. Some minerals commonly found in kimberlites and lamproites are also found in alkali basalts, carbonatites, lamprophyres and other rocks. Care should be taken to screen for minerals only of potential economic importance.

Diamond inclusion (DI) mineral chemistries are determined from syngenetic inclusions from diamonds. Diamond inclusion chromites typically have greater than 60 wt. % Cr_2O_3, Mg# greater than .6 and Al_2O_3 less than 10 wt. %. Eclogitic garnet containing greater than .07 wt. % Na_2O with elevated titanium (McCandless and Gurney, 1989 and Fipke et al., 1989) have been found as diamond inclusions.

Eclogites and peridotites are the two paragenetic sources of minerals from the upper mantle. They are found in xenocrysts and xenoliths in the primary source rocks. Peridotites are the source for peridotitic G1, G2, G7, G9, G10 and G11 garnets (Stephen and Dawson, 1975) and chrome diopside. Eclogitic rocks are formed from failed basaltic melts in the upper mantle or the ultrametamorphism of subducted oceanic crust. Eclogitic garnets are classes G3 and G5 garnets as defined by Stephen and Dawson (1975).

Minerals common to other rocks have compositions similar to minerals from kimberlites and lamproites. Chromium substitution in diopside increases with pressure and calcium depletion is correlative with increasing temperature. Chrome diopside is common to lamprophyres, layered mafic intrusions and other rocks. Subcalcic chrome diopside with greater than 1 wt. % Cr_2O_3 is potentially derived from peridotite xenoliths (Mitchell, 1986). Eclogitic G5 (Dawson and Stephen, 1975) garnet has been found by Fipke et al. (1989) to overlap with regional garnet compositions. Garnets containing less than 29.93 wt % FeO (Fipke et al., 1989) are potentially derived from eclogitic rocks. Picroilmenites are commonly found in carbonatites but are low in chromium. Ilmenites with greater than 9 wt. % MgO and 3 wt. % Cr_2O_3 is significant to diamond exploration.

Kimberlites contain a relatively greater variety and number indicator minerals as compared to lamproites. Because of the diversity of lamproites the only useful indicators are phenocryst and xenocryst chromites and xenocryst eclogitic garnets. Kimberlites contain a wide variety of distinctive phenocryst, macrocryst and xenolith minerals including eclogite garnets.

6 Table: Exploration Results

Sample	Indicator Minerals
9465-02	G9 and G11 with keliphytic rim
9465-03	no indicator minerals
9465-04	no indicator minerals
9465-05	no indicator minerals
9465-06	no indicator minerals
9465-07	three G9 garnets, one G1-G9 garnet and three picroilmenites
9465-08	one picroilmenite
9465-09	one chrome-diopside and one G9
9465-10	no indicator minerals
9465-11	no indicator minerals
9465-12	one chrome-diopside
9465-13	no indicator minerals
9465-14	two G9 garnets
9465-15	no indicator minerals
9465-16	no indicator minerals
9465-17	no indicator minerals
9465-18	one G9 garnet and one Aluminous Magnesium Chromite

7 Discussion

7.1 Discussion of Indicator Minerals

The predominant indicator mineral found was peridotitic garnet of the G9 (Stephen and Dawson, 1975) which is derived from garnet lherzolite. The G5 garnet found sample 9465-07 contained over 29.94 wt. % FeO and is similar to regional garnets which overlap G5 compositions (Fipke et al., 1989). Chrome-diopside was found in two samples but contain greater than 23.0 wt. % CaO indicating a low temperature origin. The picroilmenites found have compositions similar to macrocrystal ilmenites from kimberlites. The lack of eclogitic paragenesis indicator minerals and the relatively high abundance of picroilmenite suggests the source rock is a kimberlite.

7.2 Potential Source Area

The garnets have orange peel texture and one garnet from sample 9465-02 contained a partial kelyphitic rim. Ilmenites were pitted and chrome diopsides were frosted. These physical characteristics indicate that the potential source is proximal. Samples of Glaciofluvial and alluvial origin were typically found to contain indicator minerals from Etzikom Coulee. One sample contained indicator minerals from Chin Coulee. Samples of glacial morainal provenance were found to be barren of indicator minerals. A map illustrating the distribution of sample locations and indicator minerals found is given in figure 1.

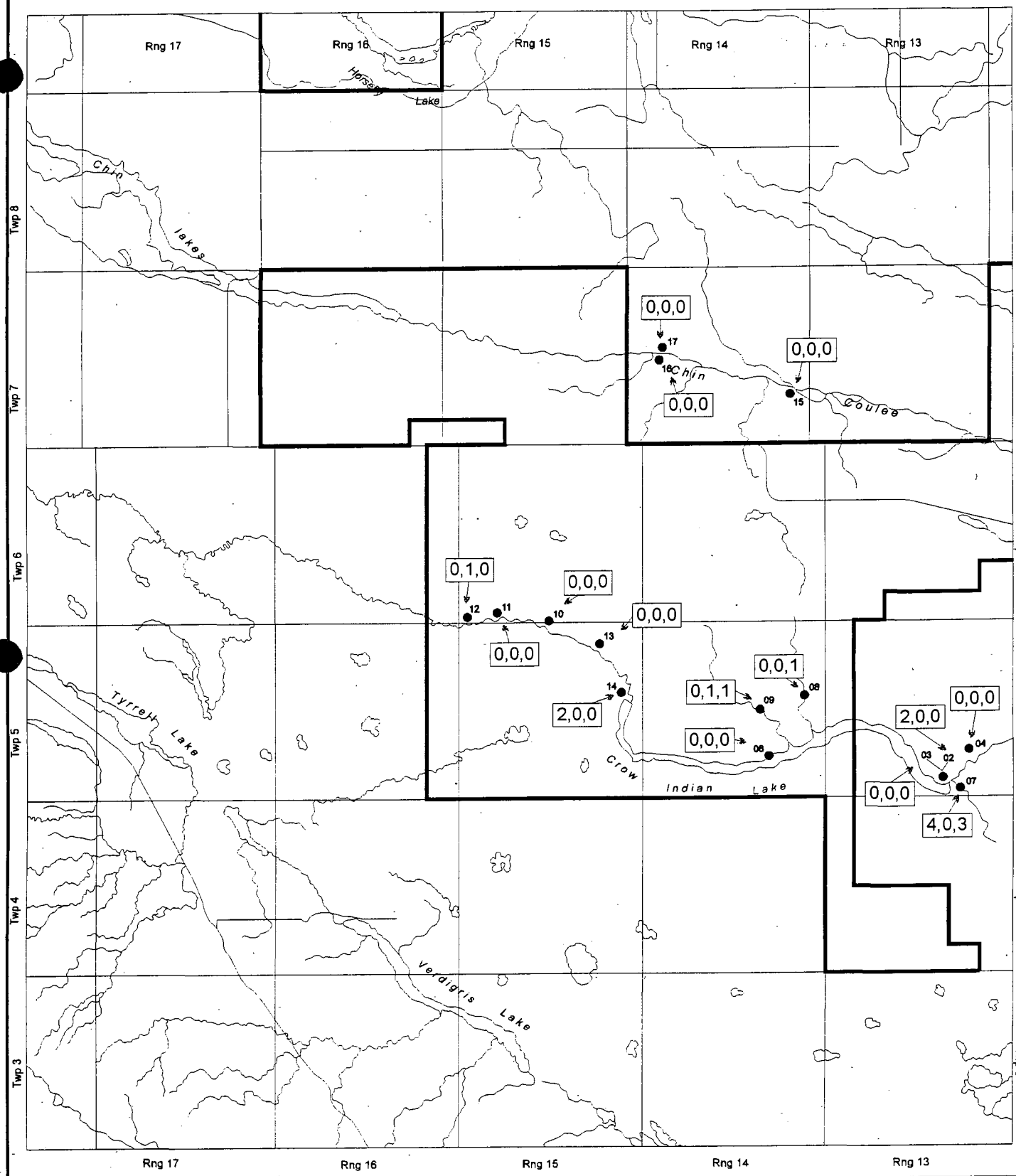

figure 1: Indicator Minerals

garnet,Cr-diopside,Mg-ilmenite

Rivers
Lakes
Roads
Property boundary
Sample locations

0 5 10 km
scale

TKR TKR TKR

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Sample 9465-07 from Etzikom Creek alluvium near the outlet of Crow Indian lake contained peridotitic garnets and picroilmenites. Sample 9465-02 taken nearby from terrace gravels contained a peridotitic garnet with a kelyphitic rim.

Two meltwater tributaries of Crow Indian Lake near the inferred preglacial Skiff valley contained indicator minerals. The meltwater tributeries drain areas of hummocky, washboard and ground moraine to the north of the lake.

Sample 9465-13 taken upstream from the Indian Crow Lake from an intertill unit contained indicator minerals. Sample 9465-13 taken nearby from alluvial sediment in Etzikom Creek contained indicator minerals.

Glacial and alluvial samples from Chin Coulee 20km north of Etzikom Coulee contained no indicator minerals. A glacial outwash deposit sampled north of Chin Coulee and lying over the inferred preglacial skiff valley contained indicator minerals.

The direction of glacial movement was to the south to southwest. The Etzikom glacial meltwater channel flowed east depositing terrace gravels. The preglacial Skiff valley flowed north crossing the present day Etzikom and Skiff Coulees. Samples taken along the Etzikom Coulee indicate a potential source exists north and northwest of Etzikom Coulee and south of Chin Coulee. Indicator minerals found in a glacial outwash deposit north of Chin Coulee could be derived from preglacial Skiff valley sediments.

7.3 Diamond Potential

Two microdiamonds have reported been found in alluvial deposits from Etzikom Coulee. Aluvial diamond concentrations are exceptionally low and the fact that two diamonds were found is a rare circumstance. Kelyphetic rims on garnets are fragile and do not travel far while other indicator minerals have a frosted surfaces indicating a proximal source. No minerals with diamond inclusion chemistries were found. This is most likely a function of the small number of indicator minerals found. The presence of diamond indicates the potential source is diamondiferous.

8 Conclusion

A large number peridotitic garnets with surface textures indicating a proximal source were found. The large number of peridotitic suite of minerals found suggests the source the potential primary source rock is kimberlite. The presence of microdiamonds indicates the potential source rock is diamondiferous.

Samples taken along the east flowing Etzikom Coulee and meltwater channels to the north of the channel contain indicator minerals. Samples taken Chin Coulee 20 km north of Etzikom Coulee were barren except for on sample of glacial outwash provenance proximal to the north flowing preglacial Skiff drainage. This suggests potential primary source rocks exists north and northwest of Etzikom Coulee. This is coincident with aeromagnetic anomalies north and northwest of Etzikom Coulee.

9 Recomendations

The results to date indicate at least one primary source rock may exist in the northwest corner of the Legend Block. Tightly spaced ground aeromagnetic survey should be conducted in the northwest and north of Etzikom Coulee coincident with aeromagnetic survey define potential drilling targets.

10 References

Dawson J.B. and Stephans W.E., 1975, Statistical Classification of Garnets from Kimberlite and Associated Xenoliths. Journal of geology, vol. 83 pp589-607.

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11 CERTIFICATE OF QUALIFICATION

I, Douglas I Sraega of [redacted] Edmonton, Alberta do hereby certify that:

1. I am a graduate of the University of Alberta, Edmonton with a B.Sc. in Science obtained in 1987.

2. I have a Special Certificate in Geology from the University of Alberta obtained in 1993.

3. I have not, nor do I expect to receive any interest directly or indirectly in the property or in the securities of Takla Star Resources Ltd.

Dated in Edmonton, Alberta, this 4th day of February, 1991

Certified Date

Appendix 10.1

Sample Site Descriptions

Sample	[redacted]	NTS	UTM (GPS)			Land Location	[redacted]ace Elevation ft. (from topo sheet)	Depth (m)	Colour	Field Carbonate
			Zone	Easting	Northing					
9465-02	9/12/92	73E/5	12U	451913	5467384	NW2-5-13W4	2925	5	Brown 10YR4/3	Strong
9465-03	9/12/92	73E/5	12U	451913	5467384	NW2-5-13W4	2925	8	Brown 10YR5/3	Weak
9465-04	9/12/92	73E/5	12U	452433	5468049	SW11-5-13W4	2950	3	Dark brown 10YR3/3	Strong
9465-05	9/12/92	73E/5	12U	451860	5466451	SW2-5-13W4	2910	2	Brown 10YR4/3	Moderate
9465-06	9/12/92	73E/5	12U	442091?	5468457?	NW11-6-13W4?	2915?	2	Olive gray 5Y4/2	Moderate
9465-07	9/12/92	73E/5	12U	452244	5467248	NW2-5-13W4	2890	0	Very dark gray 10YR3/1	Moderate
9465-08	9/12/92	73E/5	12U	444192	5472739	NW24-5-14W4	2945	1	Dark reddish brown 5YR3/3	Very strong
9465-09	9/12/92	73E/5	12U	441754	5471311	SE22-5-14W4	2950	1.5	Dark brown 10YR3/3	Very strong
9465-10	9/12/92	73E/5	12U	430106	5476694	SE4-6-15W4	2990	1	Brown 10YR4/3	Strong
9465-11	9/12/92	73E/5	12U	427826	5476390	SW5-6-15W5	2930	1.5	Dark yellowish brown 10YR4/4	Moderate
9465-12	9/12/92	82H/8	12U	427126	5477091	NE6-6-15W4	3050	1.5	Dark brown 10YR3/3	Strong
9465-13	9/12/92	73E/5	12U	433616	5475100	SW35-5-15W4	3050	1.5	Dark brown 10YR4/3	Strong
9465-14	10/12/92	73E/5	12U	436536	5472713	NW24-5-15W4	2920	1	Very dark grayish brown 10YR4/2	Very Strong
9465-15	10/12/92	73E/12	12U	443274	5488532	NW12-7-14W4	2800	1	Dark yellowish brown 10YR4/4	Strong
9465-16	10/12/92	73E/12	12U	436906	5491293	SW20-7-14W4	2950	2	Dark yellowish brown 10YR4/4	Weak
9465-17	10/12/92	73E/12	12U	436906	5491263	SW20-7-14W4	2750	1.5	Olive 5Y4/4	Moderate
9465-18	10/12/92	73E/12	12U	435353	5493914	SW31-7-14W4	2925	1.5	Very dark grayish brown 10YR3/2	Very strong

Note: UTM coordinates for 9465-06 plot sample location in Crow Indian Lake.

Sample	Texture	Environment	Comments
9465-02	coarse sand	Glaciofluvial terrace	Gravel pit on inside bend Etzikom Coulee, coarse gravelly sand, sieved, overlain by 5 m poorly sorted coarse gravel
9465-03	medium sand	Glaciofluvial terrace	Same site as 9465-02, sieved, channel-fill deposit, gravel finery and unit more resistive than 9465-02
9465-04	silty sand	Morainal plain, eroded	Exposed backslope of old road, few oversized clasts, north flank Etzikom Coulee
9465-05	silty sand	Morainal plain, eroded	Cutbank (caused by slumping) south shore Crow Indian Lake
9465-06	clayey silt	Morainal plain, eroded	Backslope grid road 877, about 0.5 m below contact with overlying bouldery (abl?) material north bank Etzikom Coulee, blocky
9465-07	gravelly sand	Alluvial	Etzikom Creek alluvium, organics, some gravel, unsieved
9465-08	gravelly sand	Glaciofluvial terrace	very poorly sorted, small meltwater channel tributary to Etzikom Coulee, unsieved
9465-09	medium-coarse sand	Glaciofluvial terrace	Old gravel pit, small meltwater channel tributary to Etzikom Coulee, sieved, poorly sorted
9465-10	silty sand	Morainal plain, eroded	Man-made cut near pumpjack, Etzikom Coulee
9465-11	silty sand	Morainal plain	South bank Etzikom Creek, jointed
9465-12	medium-coarse sand	Glaciofluvial plain	Large gravel pit unit overlain by 0.75 m till and 0.75 m silt (lacustrine? aeolian?) north bank Etzikom Coulee, sieved
9465-13	clayey silt	Morainal plain, eroded	Back slope, farm access road, north bank Etzikom Coulee, coal clasts
9465-14	silty sand	Glaciofluvial terrace? Alluvial fan? Morainal?	Sand, silt, gravel diamicton; clast supported in places; tabular, imbricated clasts; sieved; bottom of Etzikom Coulee
9465-15	silty sand	Morainal plain, eroded	Old road cut, east of road 877, south bank Chin Coulee
9465-16	medium grained sand	Glaciofluvial plain?	Intertill? deposit, trough x-bdg, load casting, clean, well sorted, near bottom of north bank Chin Coulee, unsieved
9465-17	sandy silt	Morainal plain, eroded	Till overlying 9465-16; blocky, brecciated?, hard, competent, Sutherland Group equivalent?
9465-18	fine-coarse sand	Glaciofluvial plain	Backslope large gravel pit, north bank Chin Coulee; matrix supported; horizons of coal pebbles, sieved

Appendix 10.2

Electron Microprobe Results

9465 - SUMMARY AND DESCRIPTIONS OF PROBED GRAINS

GRAIN NUMBER	SAMPLE NUMBER	MINERAL TYPE VISUAL	MINERAL TYPE PROBE	COLOUR	DESCRIPTION (VISUAL)
1	9465-07	PYROPE	STAUROLITE	6A	subrounded grain; opt on remnant faces
2	9465-07	PYROPE	G9	6A	shard; remnant face has opt
3	9465-07	PYROPE	G9	6B	subrounded grain with opt; fragmented
4	9465-07	PYROPE	G4-G1	4	subrounded; remnant faces have opt
5	9465-07	PYROPE	G9-G1	4	subrounded; inclusion?, opt
6	9465-07	? PYROPE	G5	4	subangular shard
7	9465-14	PYROPE	G9-G1	5D	subrounded grain with opt, fragmented
8	9465-14	PYROPE	G9-G10	5D	extensively fragmented grain, small remnant primary
9	9465-02	PYROPE	G9-G10	5D	fragmented grain with opt; trace of kelyphyte?
10	9465-02	PYROPE	G4	5A	fragmented grain with opt
11	9465-18	PYROPE	G9	5B	angular shard; minor opt
12	9465-09	PYROPE	G9	5E	fragmented grain with opt
13	9465-09	CHROME DIOPSIDE	✓	GREEN	frosted, rectangular-shaped fragment C-S
14	9465-12	CHROME DIOPSIDE	✓	GREEN	frosted, inequient, subrounded grain C-S
15	9465-18	CHROMITE	✓	GRAY	subrounded, equient and euhedral
16	9465-14	X CHROMITE	SPHENE?	GRAY	subrouned, inequient
17	9465-12	X ILMENITE	✓	BLACK	angular, subnetalic
18	9465-12	X ILMENITE	RUTILE	BLACK	angular, subglassy
19	9465-18	X ILMENITE	✓	BLACK	angular, subnetalic; primary faces seen pitted
20	9465-03	mg-ILMENITE	✓	BLACK	angular, subglassy, cleavage traces present
21	9465-07	mg-ILMENITE	✓	BLACK	angular, subnetalic; primary faces seen pitted
22	9465-07	X ILMENITE	HEM.	BLACK	angular, subnetalic; primary faces seen pitted
23	9465-07	mg-ILMENITE	✓	BLACK	angular, subnetalic; primary faces seen pitted
24	9465-07	mg-ILMENITE	✓	BLACK	angular, subnetalic; primary faces seen pitted

Notes: opt = orange peel texture
HEM 1 and 2 have colours indicative of G9/G10 chemistry
a seventh pyrope (5D) from sample 9465-07 was lost

PROBE GARNET TYPES BASED UPON CLASSIFICATION OF DAWSON + STEPHENS (1975)
A '✓' INDICATES AGREEMENT BETWEEN VISUAL AND MICROPROBE DETERMINATIONS.

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 1 Comment : [redacted]1
Stage : X= 59.557 Y= 40.209 Z= 10.749
Dated on Feb 3 15:54 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	1.188	0.2628	1.127	1.0536
Al2O3	55.579	9.7238	69.670	0.7977
SiO2	29.836	4.4287	22.737	1.3122
K2O	0.000	0.0000	0.000	0.0000
CaO	0.000	0.0000	0.000	0.0000
TiO2	1.221	0.1363	1.055	1.1578
Cr2O3	0.000	0.0000	0.000	0.0000
MnO	0.000	0.0000	0.000	0.0000
FeO	0.174	0.0216	0.160	1.0848
ZnO	0.000	0.0000	0.000	0.0000
Total	87.998	14.5731	94.749	

staurolite

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 2 Comment : [redacted]3
Stage : X= 61.580 Y= 40.502 Z= 10.752
Dated on Feb 3 16:00 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	21.048	4.5495	17.138	1.2282
Al2O3	19.694	3.3659	18.734	1.0513
SiO2	40.637	5.8923	34.219	1.1876
K2O	0.000	0.0000	0.000	0.0000
CaO	5.521	0.8578	5.082	1.0864
TiO2	0.000	0.0000	0.000	0.0000
Cr2O3	4.406	0.5052	4.109	1.0724
MnO	0.464	0.0570	0.450	1.0310
FeO	7.788	0.9445	7.165	1.0871
ZnO	0.000	0.0000	0.000	0.0000
Total	99.558	16.1722	86.896	

G-9

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 3 Comment : [redacted]4
Stage : X= 63.184 Y= 40.140 Z= 10.755
Dated on Feb 3 16:06 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.001	0.0002	0.001	0.8923
MgO	22.844	4.8881	18.999	1.2024
Al2O3	19.499	3.2991	18.510	1.0534
SiO2	41.387	5.9409	34.821	1.1886
K2O	0.000	0.0000	0.000	0.0000
CaO	4.896	0.7530	4.494	1.0893
TiO2	0.454	0.0490	0.395	1.1500
Cr2O3	3.380	0.3836	3.140	1.0762
MnO	0.249	0.0303	0.241	1.0328
FeO	6.871	0.8248	6.318	1.0876
ZnO	0.000	0.0000	0.000	0.0000
Total	99.581	16.1689	86.919	

G-4

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 4 Comment : [redacted]7
Stage : X= 64.657 Y= 40.069 Z= 10.755
Dated on Feb 3 16:13 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.002	0.0006	0.002	0.9107
MgO	22.209	4.7795	18.189	1.2210
Al2O3	18.499	3.1479	17.498	1.0572
SiO2	41.103	5.9337	34.735	1.1833
K2O	0.000	0.0000	0.000	0.0000
CaO	5.190	0.8028	4.778	1.0862
TiO2	0.408	0.0443	0.356	1.1459
Cr2O3	5.025	0.5736	4.674	1.0751
MnO	0.288	0.0352	0.279	1.0315
FeO	6.990	0.8440	6.422	1.0884
ZnO	0.000	0.0000	0.000	0.0000
Total	99.714	16.1615	86.934	

G-9

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 5 Comment : [redacted]8
Stage : X= 66.651 Y= 40.097 Z= 10.755
Dated on Feb 3 16:19 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.001	0.0002	0.001	0.9090
MgO	22.745	4.8814	18.652	1.2195
Al2O3	17.922	3.0414	16.901	1.0604
SiO2	41.134	5.9222	34.827	1.1811
K2O	0.000	0.0000	0.000	0.0000
CaO	5.226	0.8061	4.814	1.0854
TiO2	0.538	0.0583	0.470	1.1451
Cr2O3	5.779	0.6579	5.366	1.0770
MnO	0.256	0.0312	0.248	1.0315
FeO	6.406	0.7713	5.879	1.0895
ZnO	0.000	0.0000	0.000	0.0000
Total	100.007	16.1700	87.159	

G-9

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 6 Comment : [redacted]10
Stage : X= 68.167 Y= 40.142 Z= 10.755
Dated on Feb 3 16:25 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	22.706	4.8228	18.737	1.2118
Al2O3	19.978	3.3552	18.935	1.0550
SiO2	41.320	5.8874	34.683	1.1913
K2O	0.000	0.0000	0.000	0.0000
CaO	4.842	0.7392	4.449	1.0883
TiO2	0.075	0.0080	0.065	1.1471
Cr2O3	4.214	0.4747	3.924	1.0740
MnO	0.341	0.0411	0.330	1.0315
FeO	7.226	0.8611	6.646	1.0874
ZnO	0.000	0.0000	0.000	0.0000
Total	100.702	16.1896	87.770	

G-9

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 19 Comment : [redacted]9
Stage : X= 24.235 Y= 40.226 Z= 10.551
Dated on Feb 3 17:41 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	22.473 ✓	4.8369	18.189	1.2355
Al2O3	16.725	2.8463	15.699	1.0653
SiO2	40.816	5.8931	34.739	1.1749
K2O	0.000	0.0000	0.000	0.0000
CaO	5.952	0.9208	5.500	1.0822
TiO2	0.898	0.0975	0.785	1.1434
Cr2O3	6.826	0.7793	6.337	1.0773
MnO	0.266	0.0325	0.258	1.0312
FeO	6.544	0.7901	6.001	1.0904
ZnO	0.000	0.0000	0.000	0.0000
Total	100.500	16.1966	87.508	

G-11

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 20 Comment : [redacted]13
Stage : X= 25.236 Y= 40.039 Z= 10.549
Dated on Feb 3 17:47 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.725	0.2035	0.809	0.8961
MgO	17.689	3.8175	14.504	1.2196
Al2O3	1.896	0.3236	1.877	1.0103
SiO2	53.336	7.7218	51.691	1.0318
K2O	0.000	0.0000	0.000	0.0000
CaO	23.248	3.6065	21.432	1.0847
TiO2	0.063	0.0069	0.052	1.2077
Cr2O3	0.874	0.1001	0.784	1.1160
MnO	0.071	0.0087	0.067	1.0541
FeO	3.077	0.3726	2.792	1.1022
ZnO	0.000	0.0000	0.000	0.0000
Total	100.979	16.1612	94.008	

Low
C-5 Chinue diopside.
cpx

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 7 Comment : [redacted]11
Stage : X= 60.844 Y= 42.154 Z= 10.752
Dated on Feb 3 16:31 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	21.086	4.5633	17.033	1.2379
Al2O3	18.128	3.1021	17.170	1.0558
SiO2	40.743	5.9150	34.564	1.1788
K2O	0.000	0.0000	0.000	0.0000
CaO	5.931	0.9227	5.474	1.0836
TiO2	0.045	0.0049	0.039	1.1436
Cr2O3	6.483	0.7441	6.033	1.0745
MnO	0.404	0.0497	0.392	1.0304
FeO	7.042	0.8550	6.465	1.0893
ZnO	0.004	0.0004	0.003	1.1284
Total	99.866	16.1570	87.172	

G-9

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 8 Comment : [redacted]12
Stage : X= 62.562 Y= 42.103 Z= 10.755
Dated on Feb 3 16:38 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.005	0.0013	0.005	0.8911
MgO	23.097	4.9158	19.228	1.2012
Al2O3	19.995	3.3649	18.970	1.0540
SiO2	41.257	5.8905	34.617	1.1918
K2O	0.000	0.0000	0.000	0.0000
CaO	4.771	0.7299	4.380	1.0893
TiO2	0.340	0.0365	0.296	1.1493
Cr2O3	3.582	0.4044	3.329	1.0760
MnO	0.273	0.0330	0.265	1.0325
FeO	6.807	0.8128	6.259	1.0875
ZnO	0.000	0.0000	0.000	0.0000
Total	100.127	16.1890	87.349	

G-9

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 21 Comment : [redacted]14
Stage : X= 26.288 Y= 40.053 Z= 10.545
Dated on Feb 3 17:54 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.688	0.1932	0.767	0.8967
MgO	17.457	3.7681	14.314	1.2196
Al2O3	1.701	0.2903	1.687	1.0082
SiO2	53.392	7.7309	51.894	1.0289
K2O	0.000	0.0000	0.000	0.0000
CaO	23.770	3.6879	21.923	1.0843
TiO2	0.090	0.0098	0.074	1.2088
Cr2O3	1.038	0.1188	0.929	1.1172
MnO	0.068	0.0084	0.065	1.0546
FeO	2.841	0.3440	2.576	1.1028
ZnO	0.000	0.0000	0.000	0.0000
Total	101.045	16.1514	94.229	

G-5 high Chrome-diopside cpx

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 22 Comment : [redacted]15
Stage : X= 21.619 Y= 41.305 Z= 10.559
Dated on Feb 3 17:59 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	15.297	4.4833	8.477	1.8044
Al2O3	9.561	2.2157	7.384	1.2947
SiO2	0.037	0.0074	0.029	1.2738
K2O	0.000	0.0000	0.000	0.0000
CaO	0.000	0.0000	0.000	0.0000
TiO2	0.438	0.0647	0.455	0.9630
Cr2O3	53.984	8.3919	54.336	0.9935
MnO	0.267	0.0444	0.276	0.9681
FeO	20.757	3.4132	19.091	1.0873
ZnO	0.025	0.0036	0.023	1.0977
Total	100.366	18.6241	90.071	

FeO 11.256
Fe_2O_3 10.629
New Tot 101.490

Na 0.0
Mg .7221
Al .2569
Si .0012
K 0
Ca 0
Ti .0104
Cr 1.3518
Mn .0072
Zn .0006
Fe2 .27
Fe3 .28

High Chrome chromite
Mg# .7195
Ti# .0061
Cr# .6838
Fe2# .2805
Fe3# .1357

Zn ppm 201

AMC

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 23 Comment : [redacted]16
Stage : X= 22.663 Y= 41.231 Z= 10.558
Dated on Feb 4 09:00 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	0.124	0.0333	0.079	1.5789
Al2O3	2.764	0.5849	2.635	1.0490
SiO2	35.498	6.3727	33.495	1.0598
K2O	0.000	0.0000	0.000	0.0000
CaO	32.249	6.2035	30.887	1.0441
TiO2	0.652	0.0881	0.551	1.1838
Cr2O3	0.000	0.0000	0.000	0.0000
MnO	1.049	0.1595	1.012	1.0370
FeO	25.341	3.8047	23.453	1.0805
ZnO	0.000	0.0000	0.000	0.0000
Total	97.677	17.2468	92.112	

sphene ? X
No Ti !

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 9 Comment : [redacted]17
Stage : X= 64.051 Y= 41.758 Z= 10.755
Dated on Feb 3 16:43 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	0.000	0.0000	0.000	0.0000
Al2O3	5.105	1.8063	3.614	1.4125
SiO2	1.248	0.3746	0.937	1.3313
K2O	0.000	0.0000	0.000	0.0000
CaO	0.058	0.0186	0.059	0.9857
TiO2	0.000	0.0000	0.000	0.0000
Cr2O3	0.000	0.0000	0.000	0.0000
MnO	0.000	0.0000	0.000	0.0000
FeO	81.744	20.5227	82.208	0.9943
ZnO	0.000	0.0000	0.000	0.0000
Total	88.155	22.7222	86.818	

hematite

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 10 Comment : [redacted]18
Stage : X= 65.857 Y= 41.993 Z= 10.758
Dated on Feb 3 16:49 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	1.390	0.4123	0.748	1.8573
Al2O3	0.202	0.0475	0.169	1.1991
SiO2	0.219	0.0435	0.192	1.1377
K2O	0.000	0.0000	0.000	0.0000
CaO	0.087	0.0186	0.095	0.9162
TiO2	61.030	9.1359	58.983	1.0347
Cr2O3	0.106	0.0167	0.099	1.0652
MnO	0.457	0.0770	0.445	1.0261
FeO	30.259	5.0371	28.500	1.0617
ZnO	0.000	0.0000	0.000	0.0000
Total	93.750	14.7885	89.231	

pseudorutile

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 24 Comment : [redacted]19
Stage : X= 23.896 Y= 41.295 Z= 10.550
Dated on Feb 3 18:10 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	13.511	3.7363	7.554	1.7886
Al2O3	0.599	0.1311	0.473	1.2681
SiO2	0.000	0.0000	0.000	0.0000
K2O	0.000	0.0000	0.000	0.0000
CaO	0.000	0.0000	0.000	0.0000
TiO2	53.138	7.4135	50.860	1.0448
Cr2O3	0.439	0.0644	0.417	1.0527
MnO	0.199	0.0312	0.194	1.0225
FeO	32.952	5.1124	31.051	1.0612
ZnO	0.000	0.0000	0.000	0.0000
Total	100.838	16.4888	90.548	

Ilmenite low chrome.

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 11 Comment : [redacted]20
Stage : X= 67.249 Y= 41.870 Z= 10.758
Dated on Feb 3 16:55 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	12.431	3.4646	6.876	1.8077
Al2O3	0.191	0.0422	0.151	1.2683
SiO2	0.013	0.0024	0.011	1.1890
K2O	0.000	0.0000	0.000	0.0000
CaO	0.000	0.0000	0.000	0.0000
TiO2	51.827	7.2875	49.802	1.0407
Cr2O3	2.940	0.4346	2.802	1.0491
MnO	0.290	0.0459	0.284	1.0194
FeO	33.222	5.1947	31.294	1.0616
ZnO	0.000	0.0000	0.000	0.0000
Total	100.914	16.4718	91.221	

HIGH CHROME ILMENITE
mg-ilm

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 12 Comment : [redacted]21
Stage : X= 61.774 Y= 44.057 Z= 10.754
Dated on Feb 3 17:00 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	10.964	3.1062	5.959	1.8398
Al2O3	0.154	0.0346	0.121	1.2720
SiO2	0.045	0.0086	0.038	1.1913
K2O	0.000	0.0000	0.000	0.0000
CaO	0.000	0.0000	0.000	0.0000
TiO2	51.611	7.3766	49.681	1.0388
Cr2O3	0.659	0.0991	0.633	1.0414
MnO	0.261	0.0420	0.257	1.0176
FeO	37.000	5.8808	35.013	1.0568
ZnO	0.000	0.0000	0.000	0.0000
Total	100.694	16.5479	91.702	

Low Chrome - Ilmenite

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 13 Comment : [redacted]22
Stage : X= 63.754 Y= 43.977 Z= 10.756
Dated on Feb 3 17:06 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	0.122	0.0501	0.054	2.2698
Al2O3	0.065	0.0211	0.047	1.3960
SiO2	0.043	0.0117	0.033	1.2801
K2O	0.000	0.0000	0.000	0.0000
CaO	0.000	0.0000	0.000	0.0000
TiO2	14.279	2.9611	14.517	0.9835
Cr2O3	0.000	0.0000	0.000	0.0000
MnO	0.080	0.0188	0.084	0.9608
FeO	77.850	17.9537	77.532	1.0041
ZnO	0.000	0.0000	0.000	0.0000
Total	92.439	21.0166	92.266	

hematite ?

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 14 Comment : [redacted]23
Stage : X= 65.394 Y= 44.121 Z= 10.759
Dated on Feb 3 17:11 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	12.263	3.4044	6.752	1.8164
Al2O3	0.547	0.1201	0.431	1.2705
SiO2	0.052	0.0097	0.044	1.1930
K2O	0.000	0.0000	0.000	0.0000
CaO	0.000	0.0000	0.000	0.0000
TiO2	52.636	7.3719	50.519	1.0419
Cr2O3	0.191	0.0281	0.182	1.0459
MnO	0.256	0.0403	0.251	1.0198
FeO	35.760	5.5696	33.789	1.0584
ZnO	0.000	0.0000	0.000	0.0000
Total	101.705	16.5442	91.967	

low chrome Ilmenite

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 24 Comment : [redacted]22
Stage : X= 64.443 Y= 83.666 Z= 10.610
Dated on Feb 5 12:10 1993
WDS only

hematite with minute TiO_2 inclusions

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	0.011	0.0047	0.005	2.2975
Al2O3	0.056	0.0188	0.040	1.4090
SiO2	0.000	0.0000	0.000	0.0000
K2O	0.000	0.0000	0.000	0.0000
CaO	0.000	0.0000	0.000	0.0000
TiO2	11.089	2.3718	11.333	0.9785
Cr2O3	0.000	0.0000	0.000	0.0000
MnO	0.019	0.0046	0.020	0.9564
FeO	80.806	19.2189	80.788	1.0002
ZnO	0.000	0.0000	0.000	0.0000
Total	91.981	21.6188	92.186	

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 24 Comment : [redacted]22 inclusion
Stage : X= 64.544 Y= 83.617 Z= 10.610
Dated on Feb 5 11:52 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	0.000	0.0000	0.000	0.0000
Al2O3	0.076	0.0147	0.072	1.0658
SiO2	0.000	0.0000	0.000	0.0000
K2O	0.000	0.0000	0.000	0.0000
CaO	0.000	0.0000	0.000	0.0000
TiO2	96.288	11.8571	91.585	1.0513
Cr2O3	0.000	0.0000	0.000	0.0000
MnO	0.000	0.0000	0.000	0.0000
FeO	1.925	0.2636	1.754	1.0974
ZnO	0.000	0.0000	0.000	0.0000
Total	98.289	12.1355	93.411	

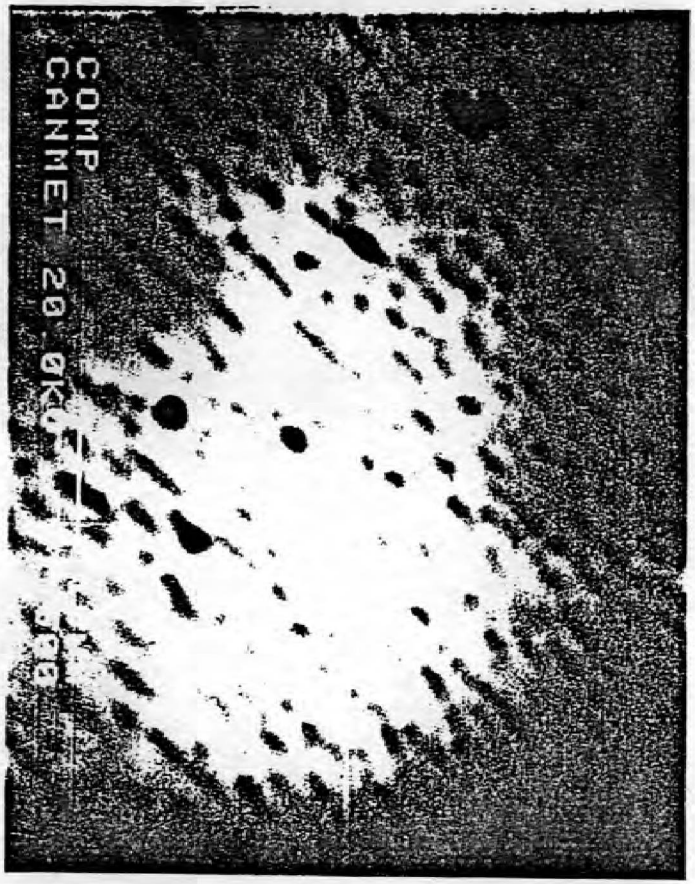
[redacted] #22

Photo (1)

HOST SITE SPOT

[redacted] #22

Photo (2)



Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 15 Comment : [redacted]24
Stage : X= 67.215 Y= 43.755 Z= 10.759
Dated on Feb 3 17:17 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	12.338	3.4531	6.810	1.8116
Al2O3	0.523	0.1156	0.411	1.2698
SiO2	0.04[redacted]	0.0076	0.034	1.1924
K2O	0.000	0.0000	0.000	0.0000
CaO	0.000	0.0000	0.000	0.9433
TiO2	52.383	7.3966	50.251	1.0424
Cr2O3	0.194	0.0288	0.185	1.0473
MnO	0.212	0.0338	0.208	1.0204
FeO	34.950	5.4880	33.006	1.0589
ZnO	0.000	0.0000	0.000	0.0000
Total	100.640	16.5235	90.906	

Ilmenite

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 16 Comment : [redacted]2
Stage : X= 20.866 Y= 39.884 Z= 10.566
Dated on Feb 3 17:23 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	20.795	4.5473	16.406	1.2675
Al2O3	15.034	2.5995	14.080	1.0677
SiO2	40.362	5.9209	34.674	1.1640
K2O	0.000	0.0000	0.000	0.0000
CaO	6.874	[redacted]0805	6.380	1.0775
TiO2	0.037	[redacted]0040	0.032	1.1371
Cr2O3	10.307	[redacted]1955	9.585	1.0754
MnO	0.288	0.0358	0.280	1.0286
FeO	6.471	0.7939	5.923	1.0926
ZnO	0.000	0.0000	0.000	0.0000
Total	100.168	16.1775	87.360	

G-9

??

Feb 05 11:17 1993 /tmp/zaf_out235 Page 1

Unknown Specimen
 Group : silicates Sample : 878[redacted]
 UNK No. : 24 Comment : 617/3
 Stage : X= 18.765 Y= 38.995 Z= 10.591
 Dated on Feb 5 11:17 1993
 WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	1.225	0.2942	0.754	1.6235
Al2O3	20.422	3.8800	18.880	1.0817
SiO2	37.630	6.0654	30.418	1.2371
K2O	0.000	0.0000	0.000	0.0000
CaO	0.556	0.0961	0.527	1.0547
TiO2	0.000	0.0000	0.000	0.0000
Cr2O3	0.000	0.0000	0.000	0.0000
MnO	10.113	1.3807	10.120	0.9993
FeO	31.733 X	4.2778	30.275	1.0482
ZnO	0.003	0.0004	0.003	1.1159
Total	101.682	15.9946	90.978	

almandine

G-5

FeO is high!

Unknown Specimen
Group : silicates Sample : 878[redacted]
UNK No. : 24 Comment : S40/4
Stage : X= 59.069 Y= 48.422 Z= 10.717
Dated on Feb 5 11:44 1993
WDS only

ZAF Oxide Acc. Voltage : 20.0 (kV)

Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.210	0.0590	0.222	0.9452
MgO	16.790	3.6252	13.312	1.2613
Al2O3	0.731	0.1248	0.714	1.0229
SiO2	54.461	7.8882	51.272	1.0622
K2O	0.000	0.0000	0.000	0.0000
CaO	22.368	3.4714	20.656	1.0829
TiO2	0.000	0.0000	0.000	1.2001
Cr2O3	0.003	0.0004	0.003	1.1029
MnO	0.231	0.0283	0.220	1.0505
FeO	7.277	0.8815	6.632	1.0973
ZnO	0.000	0.0000	0.000	0.0000
Total	102.071	16.0787	93.031	

Diopside

Unknown Specimen
Group : silicates
UNK No. : 17
Stage : X= 21.968
Dated on Feb 3 17:29 1993
WDS only

Sample : 878[redacted]/5
Comment : [redacted]/5
Y= 39.949 Z= 10.560

Acc. Voltage : 20.0 (kV)

ZAF Oxide Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	22.821	4.8800	18.813	1.2130
Al2O3	18.950	3.2040	17.919	1.0575
SiO2	40.918	5.8696	34.494	1.1862
K2O	0.000	0.0000	0.000	0.0000
CaO	5.289	0.8129	4.867	1.0866
TiO2	0.714	0.0771	0.622	1.1478
Cr2O3	4.494	0.5097	4.173	1.0769
MnO	0.305	0.0371	0.296	1.0323
FeO	6.719	0.8060	6.173	1.0885
ZnO	0.000	0.0000	0.000	0.0000
Total	100.210	16.1965	87.358	

G-9.

Unknown Specimen
Group : silicates
UNK No. : 18
Stage : X= 23.256
Dated on Feb 3 17:35 1993
WDS only

Sample : 878[redacted]/6
Comment : [redacted]/6
Y= 39.998 Z= 10.556

Acc. Voltage : 20.0 (kV)

ZAF Oxide Element	Wt.(%)	Cation	K(%)	ZAF
Na2O	0.000	0.0000	0.000	0.0000
MgO	1.893	0.4592	1.171	1.6170
Al2O3	20.491	3.9303	18.886	1.0850
SiO2	36.713	5.9744	30.368	1.2089
K2O	0.000	0.0000	0.000	0.0000
CaO	2.553	0.4451	2.409	1.0599
TiO2	0.012	0.0015	0.011	1.0914
Cr2O3	0.000	0.0000	0.000	0.0000
MnO	0.308	0.0425	0.307	1.0047
FeO	38.240	5.2044	36.305	1.0533
ZnO	0.013	0.0016	0.012	1.1190
Total	100.223	16.0589	89.467	

UNKNOWN

Appendix II

Geophysical Reports

REPORT ON

PROCESSING AND INTERPRETATION

OF AEROMAGNETIC DATA

ON PART OF THE LEGEND CLAIM BLOCK

ALBERTA, CANADA

FOR

TAKLA STAR RESOURCES LTD.

BY

ROGER K. WATSON, P.ENG.

APRIL 16, 1994

INTRODUCTION

At the request of Takla Star Resources Ltd. aeromagnetic data covering part of the Legend claim block in Southern Alberta has been processed so as to enhance anomalies which are characteristic of pipe-like structures. A number of anomalies have been selected from the new data for more thorough analysis with modelling methods and several of these are believed to be potential pipe structures and are recommended for additional investigation.

The data was provided by the Geological Survey of Canada and the data processing methods were done using software from Geosoft Inc. of Toronto.

DATA

The specifications of the data set are:

Data set name:	Cypress Hills, acquired in 1992 by the GSC
Flight line spacing:	800 metres
Flying height:	150 metres mean terrain clearance
Data interval:	20 metres approximately
Sensitivity:	0.001 gamma

PROCESSING

The data was processed to provide the following maps:

1. Total field with a local background removed. The background was calculated by a least squares fit of a second degree surface to all of the data points.

2. First vertical derivative, also called vertical gradient.

3. Second vertical derivative.

4. Euler deconvolution solutions:

This process compares the theoretical shape of an pipe source anomaly to the data, point by point, using a square grid of ten data points. Using a small circle it "flags" each point that has a fit better than a specified error. The depth to the target is also provided. A complete description of the theory behind this relatively new process method is given in Appendix A.

The results show a number of flagged areas. Some are clearly coincident with buildings or other culture from the topo map. Others are not but do not lie on an recognisable anomaly. In three cases they support anomalies found on the second derivative maps.

5. MAGMOD.

This is a least squares fitting technique which uses profile data to make a best fit of the actual data to a theoretical anomaly for a selected model shape. The shape available for a kimberlite pipe is a prism, rectangular in horizontal section. The parameters which can be fitted are depth, width, dip, thickness (down dip) and magnetic susceptibility.

INTERPRETATION

Archean basement anomalies dominate the total field map and any smaller pipe-like anomalies are obscured by the gradients in the basement activity. The two vertical derivatives enhance the smaller anomalies and a number of them were selected from the second derivative map and evaluated further using the MAGMOD anomaly fitting process.

The results of twelve anomalies are described below. The numbering system is based on dividing the area into 5 km squares and numbering these from east to west as A to H and north to south as 1 to 8. If an anomaly is near the centre of the square it is given the number of the square. If near an edge or corner the direction is added to the square number. Thus B2ne is in the northeast corner of square B2.

Anomaly B2ne

This is a clear anomaly on the second derivative (VG2) map, but gives only 1 1/2 gammas on the profile of line 10870. It models to a vertical 120m wide prism, 176m below ground surface. A good model for kimberlite but graded poor because of the uncertainty inherent in analyzing a very weak anomaly. Recommended for ground follow up on a low priority basis.

Anomaly B3e

Good VG2 anomaly shows 10 gamma amplitude on Line 10800 profile. It coincides with a small road connecting two oil wells which suggests a pipeline as the cause. However other similar roads in the area have no magnetic expression so this one may not be culture. Models well to a 150m wide prism 12m below surface. Recommended for follow up by inspection for cultural source and ground magnetic survey.

Anomaly D2w

An elongated VG2 anomaly lying between basement units. It has a linear shaped cluster of Euler solutions. The profile on Line 10850 is 3 gammas and models to a steeply dipping dyke at surface, 60 metres wide. It anomaly crosses the Chin Coulee river valley which could explain the shallow depth. No culture is evident as the cause. Recommended for follow up by ground magnetic survey.

Anomaly D6ne

A sharp VG2 anomaly lying apart from the basement anomaly and with a different strike. It models to 50m wide prism lying at or near surface. No cultural cause is seen on the topographic map. Recommended for follow up.

Anomaly E2n

This excellent anomaly lies between two flight lines and therefore must be checked on the ground. It models to steeply dipping prisms on both lines. Line 10870 models to a 370m wide prism 186 m deep. Recommended on a high priority basis for follow up.

Anomaly E2s

This is a narrow sharp 14 gamma peak on Line 10830 which models to a 40m wide vertical prism at surface. It too straddles the Chin Coulee river valley which may explain the shallow depth. No culture visible on the topographic map. Recommended high priority for inspection an a ground survey.

Anomaly E4

A three-gamma anomaly on Line 10723 models to a near vertical 40 metre wide prism, coming to surface. There is no cultural source visible on the topographic map. If it passes a culture inspection recommended for a ground magnetic survey.

Anomaly F6n

This is a well-defined second derivative anomaly on two lines with the peak lying between the lines and gives a 3 gamma amplitude on Line 10620. It models well to a 70 metre wide prism at surface and dipping 88 degrees W. But the topo map shows buildings coinciding and culture may be the cause. If a site inspection shows no magnetic material the anomaly is recommended for a follow up ground survey.

Anomaly G5se

A good looking anomaly on the VG2 map provides only 2 gammas on the Line 10640 profile. The model is a prism at surface 60m wide. The flight line is along a road and so culture is a strong

possibility. A site inspection and ground survey will be easily done for this one.

Anomaly G6w

This is a strong anomaly on the VG2 map with a large cluster of Euler solutions. No buildings on the topo map but near to and parallel a road. Maybe a pipeline?

The anomaly models well to a prism, 34m wide, 40m deep and dipping 88 degrees W. This is a good model for a kimberlite pipe and should be followed up if not due to culture.

Anomaly G7

A good anomaly with a large Euler cluster. It lies directly over a bridge and is almost certainly caused by it. It is included because of its similarity to other anomalies. No further work is recommended unless site inspection should find it to be a wooden bridge or otherwise non-magnetic.

Anomaly H7

This is a strong anomaly but it coincides directly with farm buildings and is believed caused by them. It is included because when the model is restricted to that of a cultural source (thin prism) it provides a depth of 90 metres instead of the expected zero. When allowed to search for the best shape it models to a steeply dipping thick prism, 180m metres wide, lying at surface, - not a bad kimberlite model. If a site inspection should not confirm a cultural source then it is recommended for a ground magnetic survey.

SUMMARY

Twelve anomalies were selected from the second derivative map for further investigation. The results are summarized in the table below.

SUMMARY OF MAGMOD RESULTS

ANOM #	AMPL gammas	MODEL	DEPTH m	WIDTH m	CULTURE AS SOURCE	RECOMMENDATION
B2NE	1.5	thick prism	176	120	nil	Ground magnetic survey
B3E	10.0	inf prism	12	150	road?	Cult inspc, grnd survey
D2W	3.1	dyke	2	60	nil	Ground magnetic survey
D6NE	5.5	thick prism	0	47	nil	Ground magnetic survey

E2N	3.8 thick prism	0	46	well?	Cult inspc, grnd survey
E2S	13.5 Inf prism	0	36	nil	Ground magnetic survey
E4	3.0 Inf prism	0	40	nil	Cult inspc, grnd survey
F6N	3.0 Inf prism	5	70	farm	Probable cultural source
G5SE	2.5 Inf prism	0	60	road	Cult inspc, grnd survey
G6W	5.9 thick prism	26	143	nr road	Cult inspc, grnd survey
G7	6.0 Flat prism	25	50	Bridge	Probably bridge
H7	4.1 Prism	0	185	farm	Probably cultural

These anomalies and potentially others could be more easily seen with a new aeromagnetic survey flown at a lower altitude and closer line spacing. If this should be considered the following specifications are recommended:

- Line spacing - 300 metres, 200 if the budget will permit
- flying height - 200 feet mean terrain clearance
- Fixed wing is adequate.
- Cesium vapour sensor.
- reading interval about 10 - 15 metres.
- Navigation by GPS is adequate provided a base station is established and post processing is done to correct for the Selective Availability error.

[redacted]

Roger K. Watson, P.Eng.
Consulting Geophysicist

APPENDIX A

EULER DECONVOLUTION THEORY

(Geosoft Inc.)

1. INTRODUCTION

The most universal application of magnetic and gravity data has been to determine the depth to the top of the geologic sources that produce observed anomalies. For hydrocarbon exploration, this is usually equivalent to determining the maximum thickness of the sedimentary section, or the location of igneous intrusives in the section. For minerals exploration, depth estimates are often used to determine the depth and location of geologic units or structures that produce a magnetic or gravity anomaly.

GRIDEPTH is an automatic location and depth determination method for gridded magnetic and gravity data.

Based upon Euler's homogeneity equation, GRIDEPTH uses a significantly different concept from most conventional depth interpretation methods. The advantages of GRIDEPTH are :

- its ability to rapidly analyze large amounts of area data; and
- that the method does not assume any particular geologic model, thus, GRIDEPTH can be applied and interpreted even when the geology cannot be properly represented by particular models, such as prisms or dikes.

The EULER's homogeneity equation relates the field (magnetic or gravity) and its gradient components to the location of the source, with the degree of homogeneity N, which may be interpreted as a structural index (Thompsom, 1982). The Structural index is a measure of the rate of change with distance of a field. For example, in a magnetic field a narrow 2-D dike has a structural index of N=1, while a vertical pipe gives N=2. In a gravity field, a pipe has a structural index of 2, while a sphere has a structural index of 2.

In GRIDEPTH, Euler's equation is solved simultaneously for each grid position within a sub-grid (window) by a least squares method. A square window, say 10 by 10, is moved along each grid row. At each grid point there will be 100 equations (for a 10 by 10 window), from which the four unknowns (location X, Y, Z, and a background value B) and their uncertainties (standard deviations) are obtained for a specified structural index. A solution is recorded if the depth uncertainty of the calculated depth is less than a specified tolerance and the solution is within a limiting distance of the center of the data window. When the process is finished, a Geosoft XYZ file containing the depth solutions is obtained as output.

GRIDEPTH includes the following features:

- Input grid dimensions can be up to 2000x2000 points.
- Choice of structural index, which can be between 0 and 3, including fractions.
- Adjustable depth tolerance and window-source distance.
- Adjustable data window size.

GRIDEPTH is designed as an add-on product to the Geosoft Mapping and Processing System (MPS), which includes programs for data processing, gridding, grid processing and general map graphics. GRIDEPTH also make use of companion programs MAGMAP, for gradient calculations and filtering, SYPLOT, for symbol plotting, MAPEDIT for interactive graphics editing, and XYZWIND from the XYZ Utilities I to window results based on error ranges. You are assumed to be familiar with the use of the MPS in general, and the Geosoft Graphics System in particular.

2. THEORY

Any three-dimensional function $f(x,y,z)$ is said to be *homogeneous of degree n* if the function obeys the expression

$$f(tx,ty,tz) = t^n f(x,y,z)$$

From this, it can be shown that the following (known as *Euler's equation*) is also satisfied:

$$x\frac{\partial f}{\partial x} + y\frac{\partial f}{\partial y} + z\frac{\partial f}{\partial z} = nf$$

Considering potential field data, Ruler's equation can be re-stated as follows:

$$(x-x_0)\frac{\partial T}{\partial x} + (y-y_0)\frac{\partial T}{\partial y} + (z-z_0)\frac{\partial T}{\partial z} = N(B-T)$$

where (x_0,y_0,z_0) is the position of a magnetic source whose total field T is measured at (x,y,z). The total field has a regional value of B. Note that N in this expression is equivalent to $-n$ in Euler's equation.

It can easily be shown that simple magnetic and gravity models conform to Euler's equation (Thompson, 1982). The degree of homogeneity, N, can be interpreted as a *structural index* (SI), which is a measure of the rate of change with distance of a potential field. A magnetic point dipole conforms for $N = 3$, while a gravity point mass, a magnetic pole and a line of magnetic dipoles conform for $N = 2$; whereas a magnetic dyke and an anomalous pipe mass conform for $N = 1$. Reid et. al. (1990) have shown that a magnetic contact will yield an index of 0 provided that an offset A is introduced to incorporate anomaly amplitude, strike and dip factors:

$$A = (x-x_0)\frac{\partial T}{\partial x} + (y-y_0)\frac{\partial T}{\partial y} + (z-z_0)\frac{\partial T}{\partial z}$$

Given a set of observed total field data, we can determine an optimum source location (x_0,y_0,z_0) by solving Euler's equations for a given index N by least-squares inversion of the data. The inversion process will also yield an uncertainty (standard deviation) for each of the fitted parameters, and this can be used as a criterion to accept or reject a solution. This inversion process is often called Euler Deconvolution.

In GRIDEPTH, Euler deconvolution is applied by selecting a square window of data from grids of the total field and its orthogonal derivatives, solving for (x_0,y_0,z_0) and its uncertainties, saving the solution if it passes certain criteria, and moving the window to the next grid point. Solutions with a depth error (standard deviation) that exceeds a defined tolerance (typically 15%), and which are within a limiting distance of the observed window are accepted. The accepted solutions are saved in a Geosoft XYZ file that can be used to plot the results.

Note that the standard deviation is a measure only of how well the measured field conforms to Euler's equations for a given index. This assumes that the index chosen is correct for the source of the field observed in the sample

window, and that only one source is producing the field observed in the window.

For magnetic data, a significant advantage of Euler's equation is that it is insensitive to magnetic inclination, declination and remanence since these become a part of the constant in the anomaly function of a given model. However, low magnetic latitude problems will still exist for magnetic North-South geologic features because the physics of this situation dictates a low signal to noise ratio in the data. Pole reduction and careful North-South leveling noise rejection filters can be applied to low-latitude data to improve the situation somewhat.

Please refer to Reid et. al. (1990) for a more complete discussion of the Euler deconvolution method used in GRIDEPTH.

REFERENCES

Thompson, D. T., 1982, EULDPH: A new technique for making computer-assisted depth estimates from magnetic data, Geophysics, Vol.47, pp.31-37.

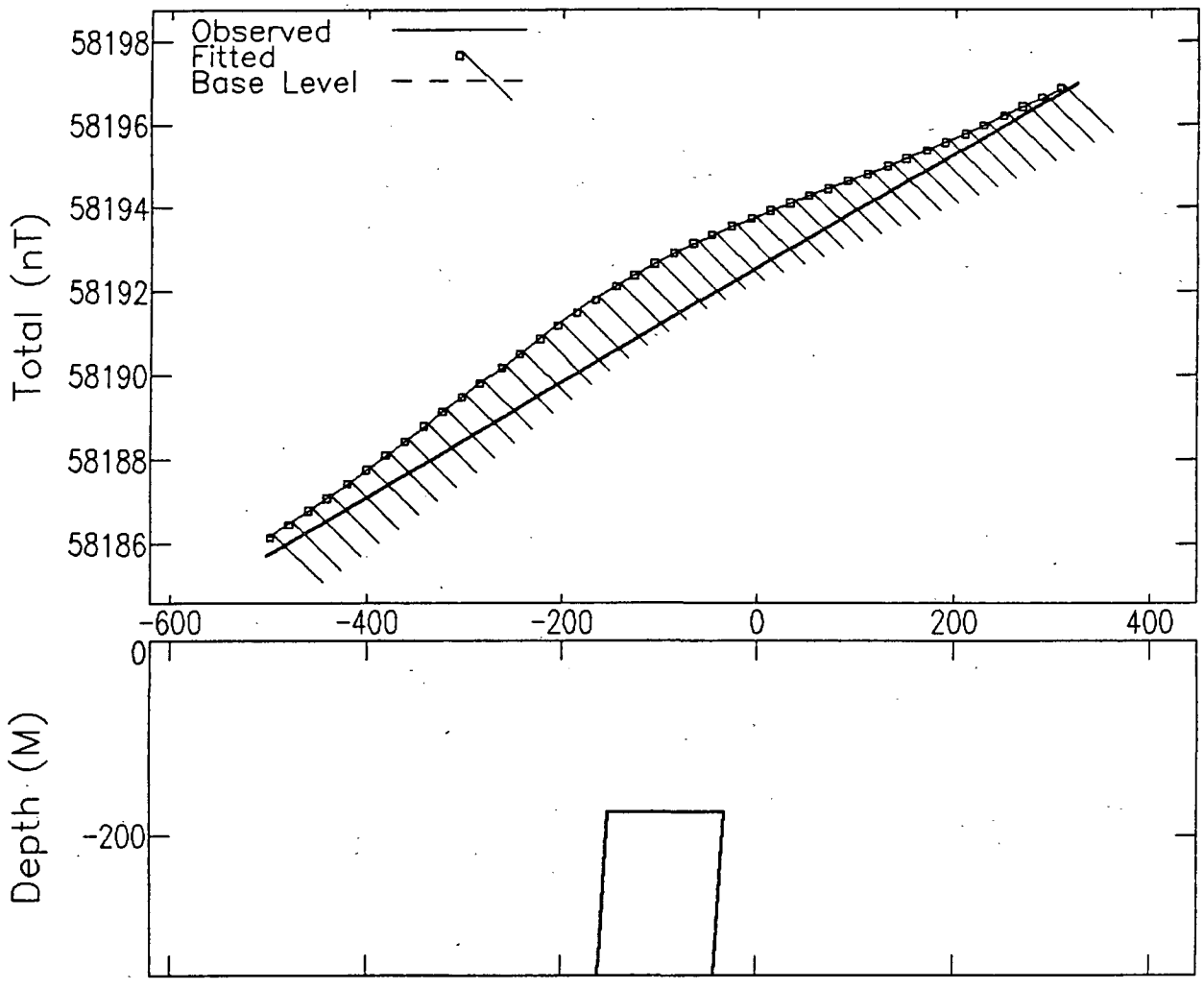
Reid, A. B., Allsop, J. M., Granser, H,, Millett, A. J., Somerton, I. W., 1990, Magnetic interpretation in three dimensions using Euler deconvolution, Geophysics, Vol.55, pp.80-91.

APPENDIX B

MAGMOD fitted anomaly profiles

ANOMALY B2NE - PRISM

10870L 01



MODEL PARAMETERS:

Model Type		Tabular2
Depth	F	176 M
Half Width	F	59.6 M
Half Length	X	500 M
Offset	X	0 M
Dip	F	94 deg
Thickness	F	422 M
Susceptibility	F	.0000679 emu
Remnance Ratio	X	0
Remnance Incl	X	0 deg
Remnance Decl	X	0 deg
Main Position	F	-92.25579 M
Cross Position	X	587.316 M
Base Level	F	58191.3 nT
Base Slope	F	.0136207 nT/M
Base Curvature	X	0 nT/M2

(F-fitted, X-fixed, L-limit)

GEOMAGNETIC FIELD:

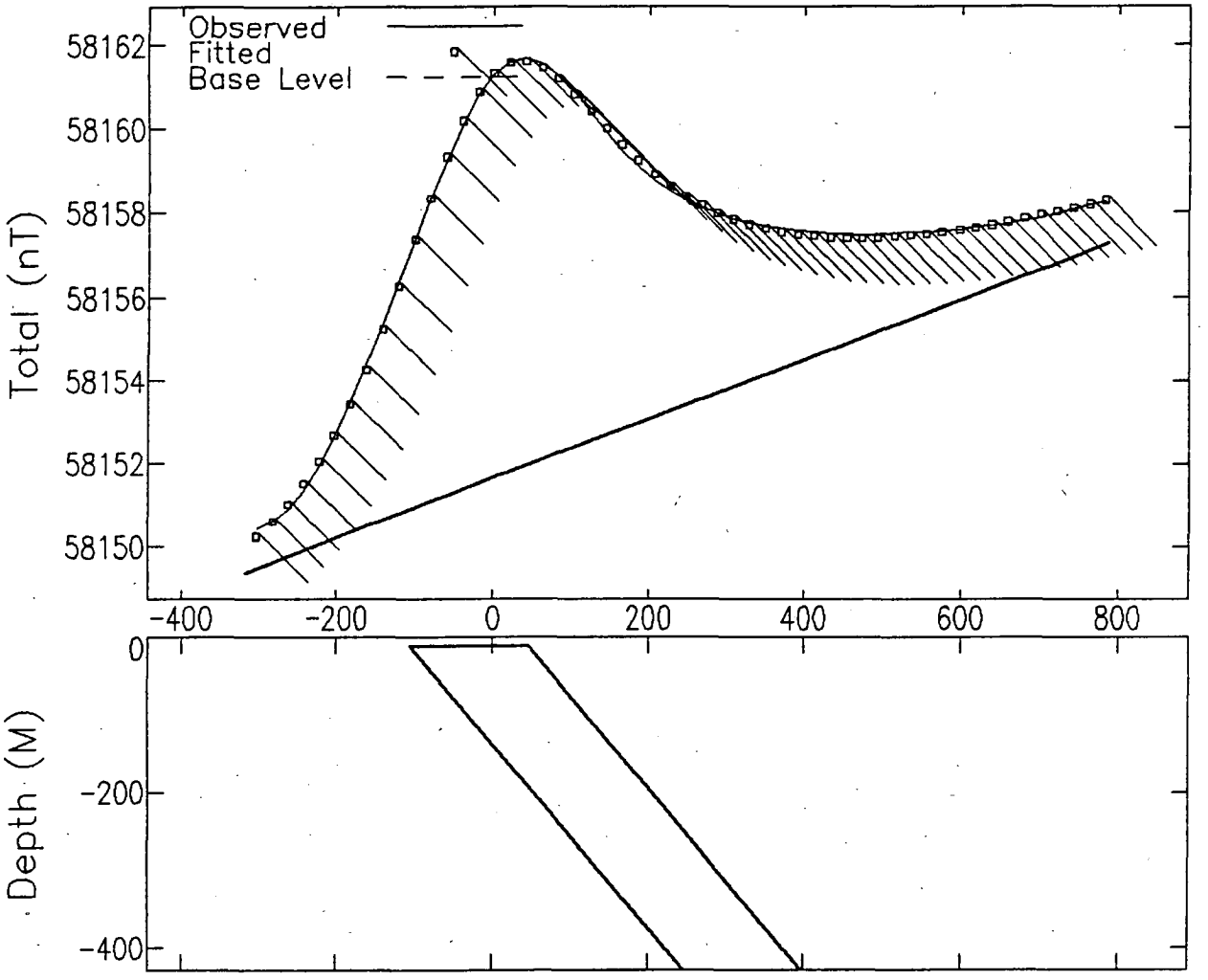
Field Strength	58000 nT
Inclination	74 deg
Declination	18 deg

COORDINATES:

Sensor Height	150 M
Strike Perp	90 deg
Line Direction	90 deg
Main Direction	90 deg
Main Offset	419850 M
Cross Direction	0 deg
Cross Offset	5494000 M

ANOMALY B3E

10800L 01



MODEL PARAMETERS:

Model Type		Tabular2
Depth	F	12.0 M
Half Width	F	75.8 M
Half Length	X	500 M
Offset	X	190 M
Dip	F	50 deg
Thickness	F	1422 M
Susceptibility	F	0.000136 emu
Remnance Ratio	X	0
Remnance Incl	X	0 deg
Remnance Decl	X	0 deg
Main Position	F	-29.83869 M
Cross Position	X	-480.8889 M
Base Level	F	58151.43 nT
Base Slope	F	.0071527 nT/M
Base Curvature	X	0 nT/M2

(F-fitted, X-fixed, L-limit)

GEOMAGNETIC FIELD:

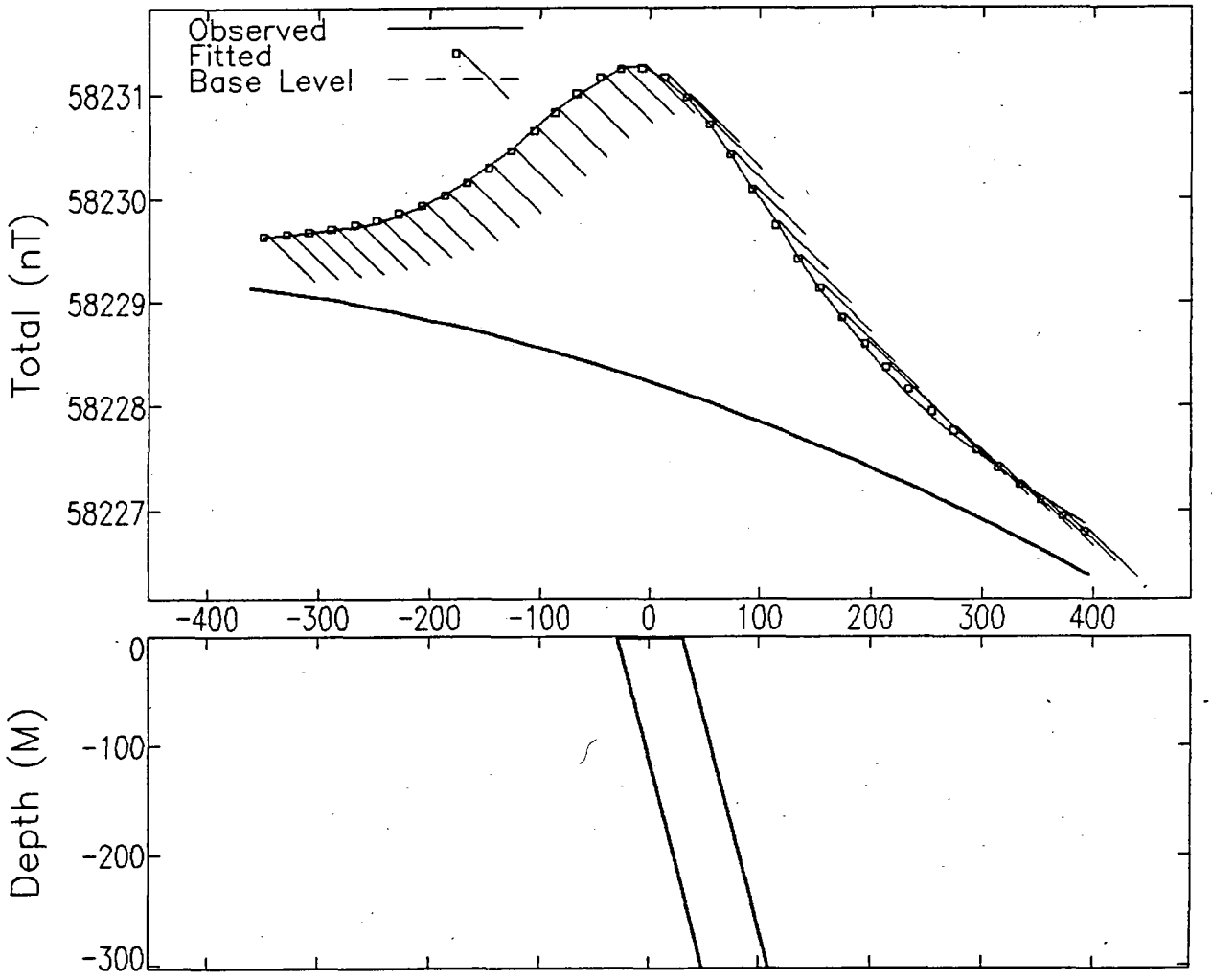
Field Strength	58000 nT
Inclination	74 deg
Declination	18 deg

COORDINATES:

Sensor Height	150 M
Strike Perp	90 deg
Line Direction	90 deg
Main Direction	90 deg
Main Offset	419500 M
Cross Direction	0 deg
Cross Offset	5489500 M

ANOMALY D2W - DYKE

10850L 01



MODEL PARAMETERS:

Model Type		Tabular
Depth	F	1.38 M
Half Width	F	29.7 M
Dip	F	76 deg
Susceptibility	F	.0000731 emu
Remnance Ratio	X	0
Remnance Incl	X	0 deg
Remnance Decl	X	0 deg
Main Position	F	.9556429 M
Cross Position	X	598.9239 M
Base Level	F	58228.23 nT
Base Slope	X	-.003555 nT/M
Base Curvature	X	-.0000028 nT/M2

(F-fitted, X-fixed, L-limit)

GEOMAGNETIC FIELD:

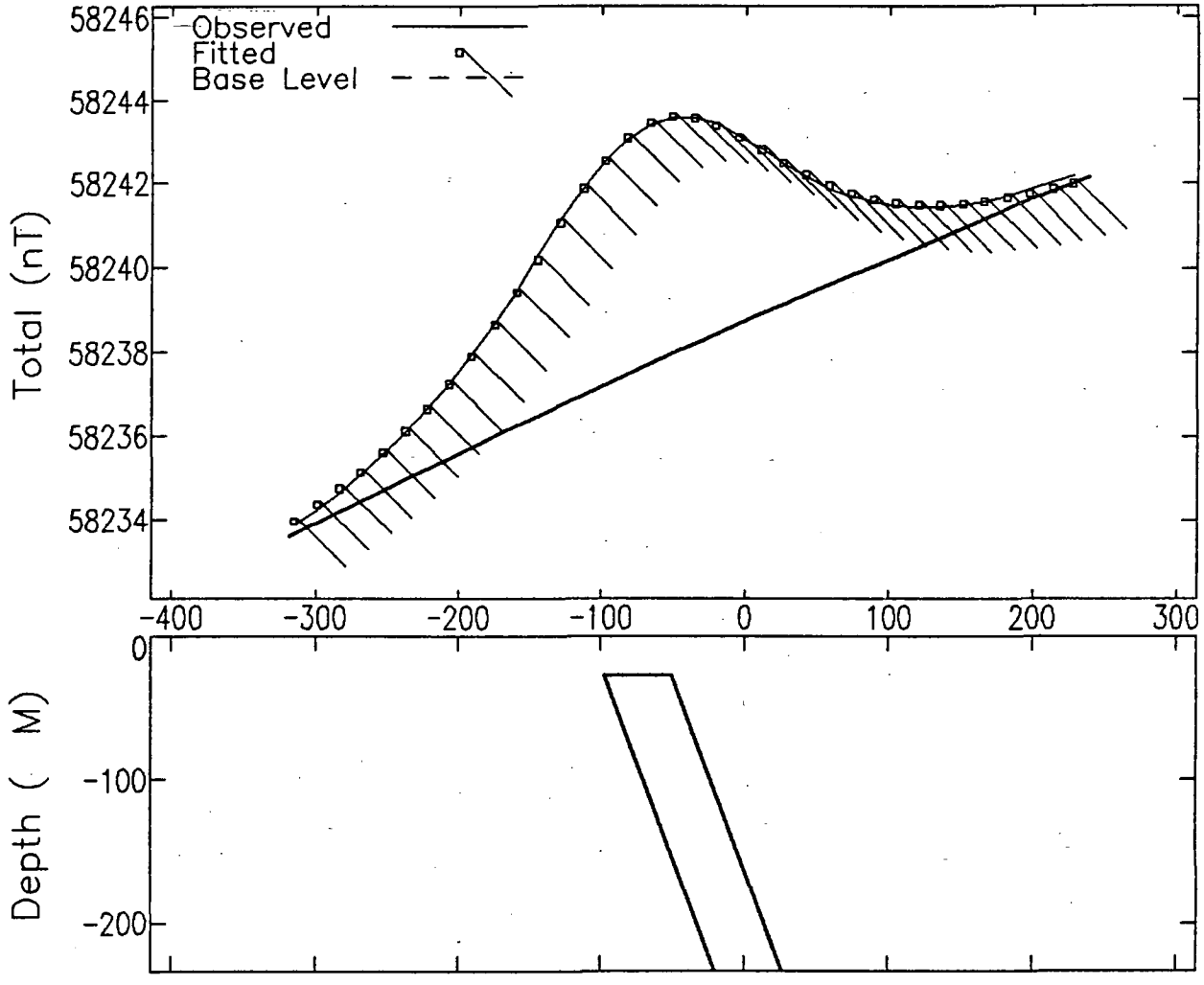
Field Strength	58000 nT
Inclination	74 deg
Declination	18 deg

COORDINATES:

Sensor Height	150 M
Strike Perp	80 deg
Line Direction	90 deg
Main Direction	90 deg
Main Offset	425900 M
Cross Direction	0 deg
Cross Offset	5492500 M

ANOMALY D6NE

10620L 01



MODEL PARAMETERS:

Model Type		Tabular2	
Depth	F	27.0	M
Half Width	F	23.4	M
Half Length	X	350	M
Offset	X	140	M
Dip	L	70	deg
Thickness	F	250	M
Susceptibility	F	0.000204	emu
Remnance Ratio	X	0	
Remnance Incl	X	0	deg
Remnance Decl	X	0	deg
Main Position	F	-74.12602	M
Cross Position	X	-57.13317	M
Base Level	F	58237.6	nT
Base Slope	X	.0156092	nT/ M
Base Curvature	X	-.0000033	nT/ M2

(F-fitted, X-fixed, L-limit)

GEOMAGNETIC FIELD:

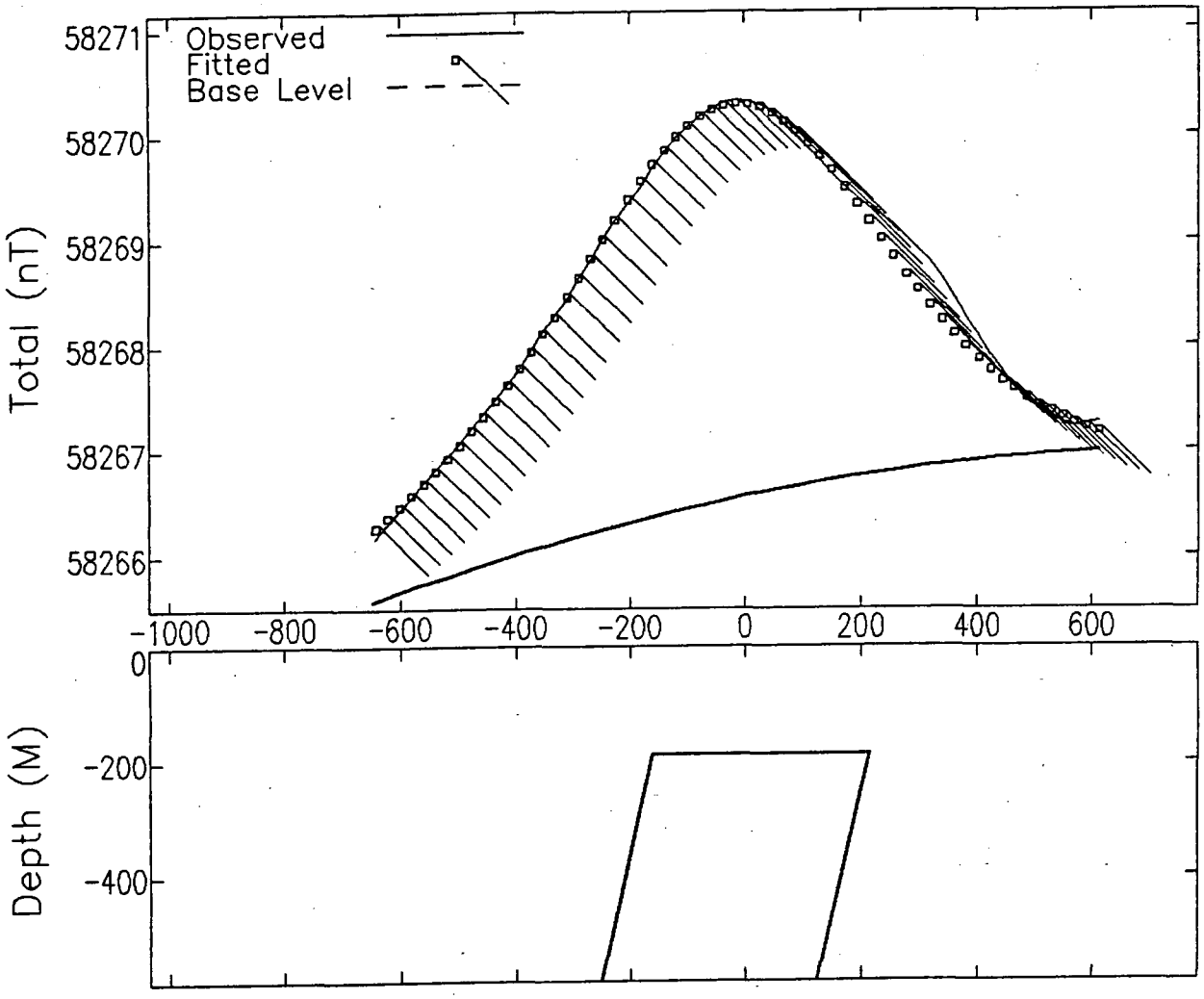
Field Strength	58240 nT
Inclination	74 deg
Declination	18 deg

COORDINATES:

Sensor Height	100 M
Strike Perp	90 deg
Line Direction	90 deg
Main Direction	90 deg
Main Offset	428900 M
Cross Direction	0 deg
Cross Offset	5474500 M

ANOMALY E2N

10870L 01



MODEL PARAMETERS:

Model Type		Tabular2
Depth	F	186 M
Half Width	F	187 M
Half Length	X	550 M
Offset	X	350 M
Dip	F	103 deg
Thickness	F	991 M
Susceptibility	F	.0000601 emu
Remnance Ratio	X	0
Remnance Incl	X	0 deg
Remnance Decl	X	0 deg
Main Position	F	26.06095 M
Cross Position	X	-92.46245 M
Base Level	F	58266.58 nT
Base Slope	X	.001065 nT/M
Base Curvature	X	-.0000007 nT/M2

(F-fitted, X-fixed, L-limit)

GEOMAGNETIC FIELD:

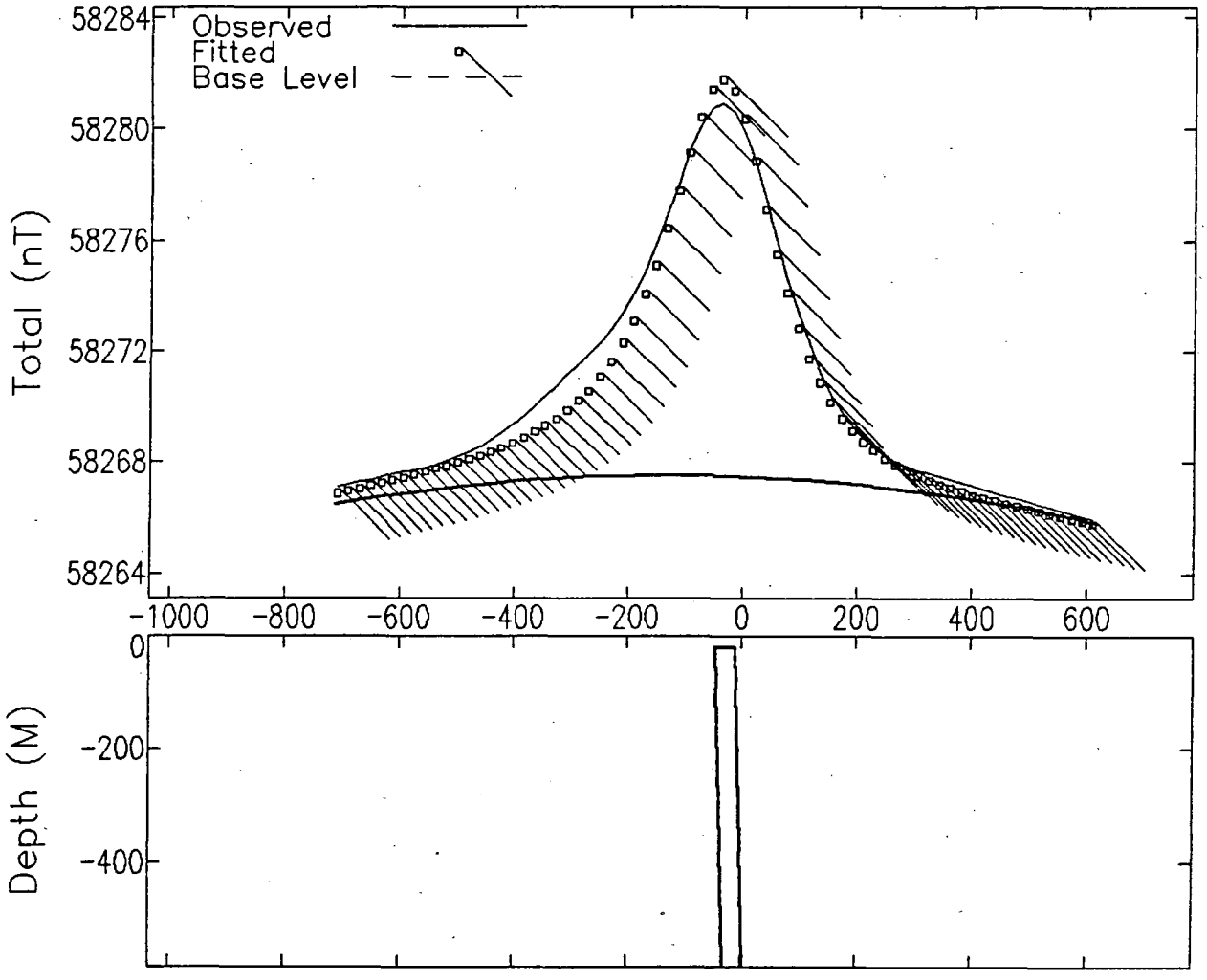
Field Strength	50000 nT
Inclination	90 deg
Declination	0 deg

COORDINATES:

Sensor Height	150 M
Strike Perp	80 deg
Line Direction	92 deg
Main Direction	90 deg
Main Offset	432800 M
Cross Direction	0 deg
Cross Offset	5494500 M

ANOMALY E2S

10830L 01



MODEL PARAMETERS:

Model Type		Tabular2
Depth	F	19.6 M
Half Width	F	17.7 M
Half Length	X	600 M
Offset	X	-100 M
Dip	F	89 deg
Thickness	L	13173 M
Susceptibility	F	0.000474 emu
Remnance Ratio	X	0
Remnance Incl	X	0 deg
Remnance Decl	X	0 deg
Main Position	F	-28.33947 M
Cross Position	X	161.8557 M
Base Level	F	58267.47 nT
Base Slope	F	-.0006003 nT/M
Base Curvature	X	-.000003 nT/M2

(F-fitted, X-fixed, L-limit)

GEOMAGNETIC FIELD:

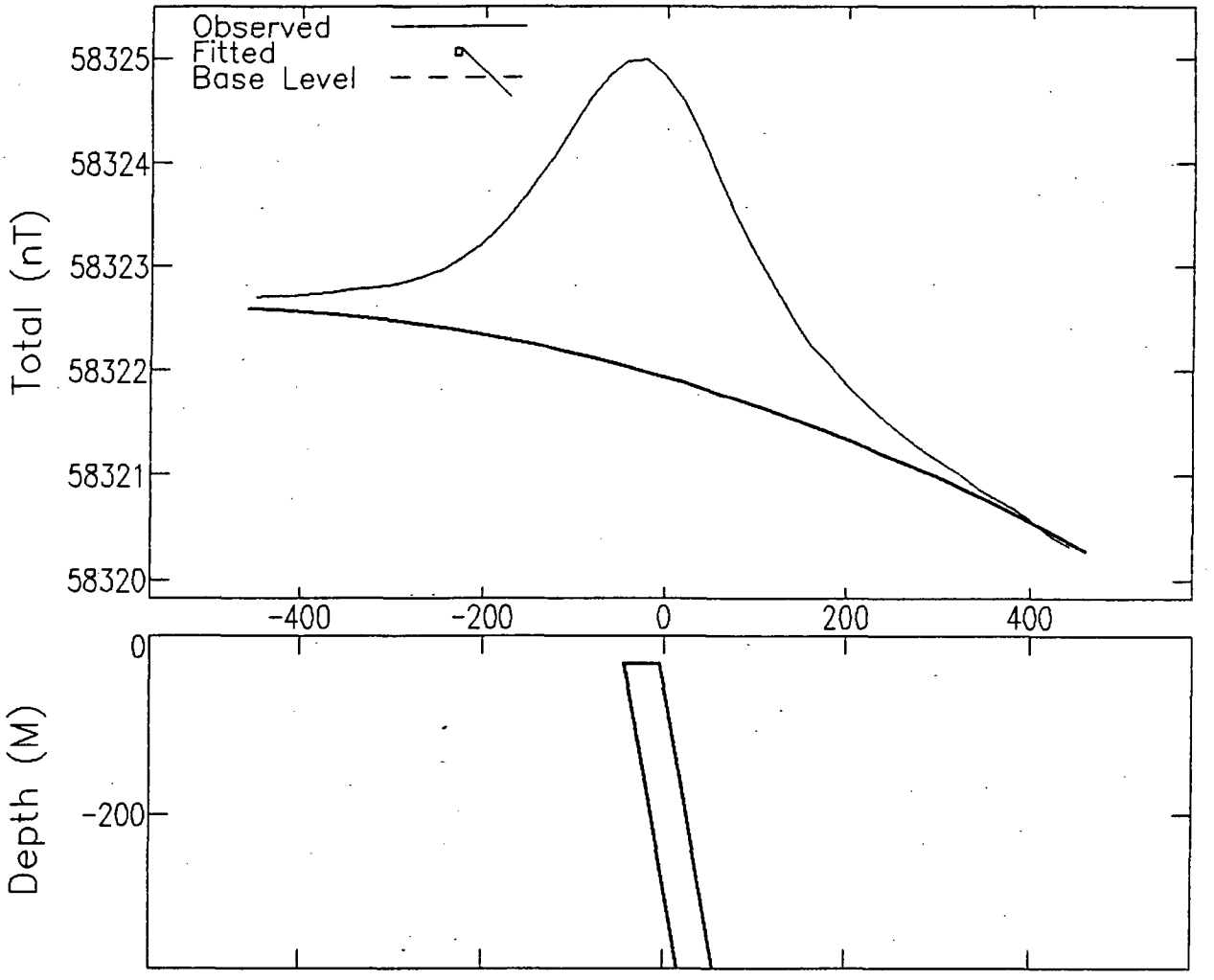
Field Strength	58200 nT
Inclination	74 deg
Declination	18 deg

COORDINATES:

Sensor Height	100 M
Strike Perp	90 deg
Line Direction	91 deg
Main Direction	90 deg
Main Offset	431800 M
Cross Direction	0 deg
Cross Offset	5491000 M

ANOMALY E4

10723L 01



MODEL PARAMETERS:

Model Type		Tabular2
Depth	F	31.0 M
Half Width	F	19.4 M
Half Length	X	650 M
Offset	X	150 M
Dip	F	80 deg
Thickness	F	746 M
Susceptibility	F	0.000106 emu
Remnance Ratio	X	0
Remnance Incl	X	0 deg
Remnance Decl	X	0 deg
Main Position	F	-24.00656 M
Cross Position	X	91.68636 M
Base Level	X	58322 nT
Base Slope	X	-.0023939 nT/M
Base Curvature	X	-.0000023 nT/M2

(F-fitted, X-fixed, L-limit)

GEOMAGNETIC FIELD:

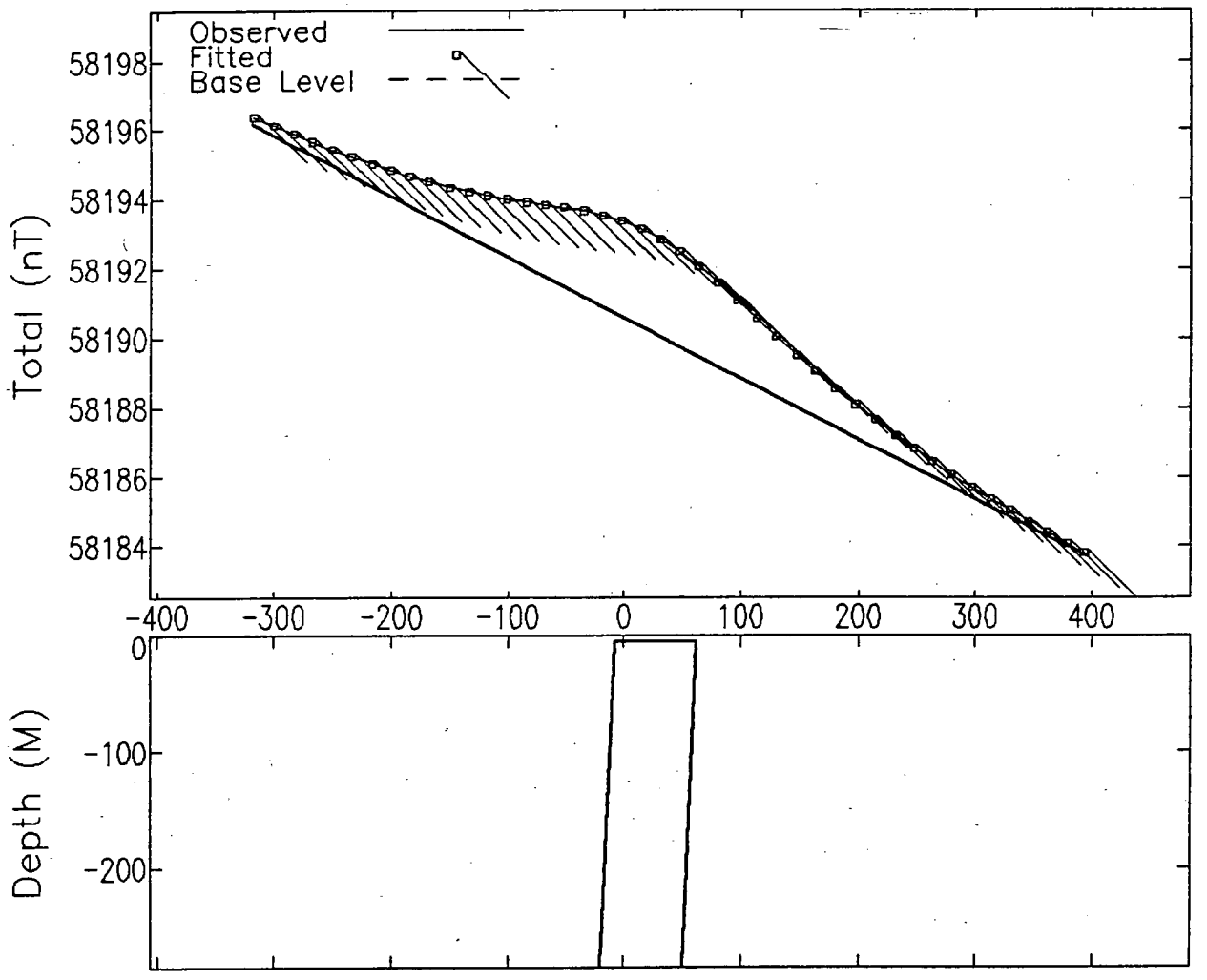
Field Strength	58300 nT
Inclination	74 deg
Declination	18 deg

COORDINATES:

Sensor Height	100 M
Strike Perp	90 deg
Line Direction	92 deg
Main Direction	90 deg
Main Offset	433000 M
Cross Direction	0 deg
Cross Offset	5482500 M

ANOMALY F6N

10620L 01



MODEL PARAMETERS:

Model Type		Tabular2
Depth	F	5.08 M
Half Width	F	35.2 M
Half Length	X	425 M
Offset	X	310 M
Dip	F	92 deg
Thickness	F	440 M
Susceptibility	F	.0000748 emu
Remnance Ratio	X	0
Remnance Incl	X	0 deg
Remnance Decl	X	0 deg
Main Position	F	27.0549 M
Cross Position	X	-152.4799 M
Base Level	F	58190.12 nT
Base Slope	F	-.0174179 nT/M
Base Curvature	X	0 nT/M2

(F-fitted, X-fixed, L-limit)

GEOMAGNETIC FIELD:

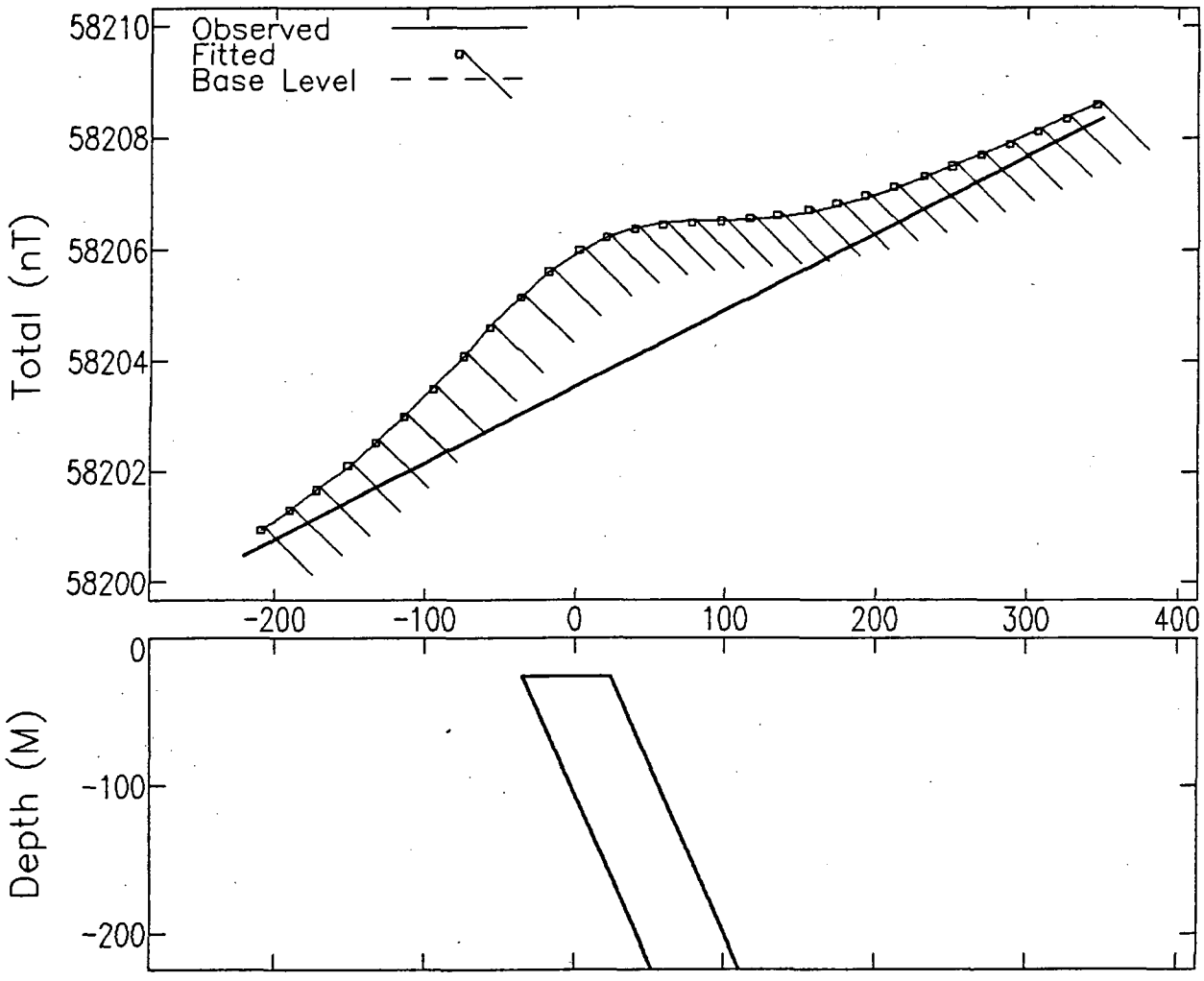
Field Strength	58200 nT
Inclination	74 deg
Declination	18 deg

COORDINATES:

Sensor Height	150 M
Strike Perp	100 deg
Line Direction	91 deg
Main Direction	90 deg
Main Offset	437250 M
Cross Direction	0 deg
Cross Offset	5474500 M

ANOMALY G5SE

10640L 01



MODEL PARAMETERS:

Model Type		Tabular2
Depth	F	25.9 M
Half Width	F	29.3 M
Half Length	X	350 M
Offset	X	-120 M
Dip	F	66 deg
Thickness	L	5549 M
Susceptibility	F	.0000631 emu
Remnance Ratio	X	0
Remnance Incl	X	0 deg
Remnance Decl	X	0 deg
Main Position	F	-5.85719 M
Cross Position	X	862.4266 M
Base Level	F	58203.45 nT
Base Slope	X	.0137544 nT/M
Base Curvature	X	0 nT/M2

(F-fitted, X-fixed, L-limit)

GEOMAGNETIC FIELD:

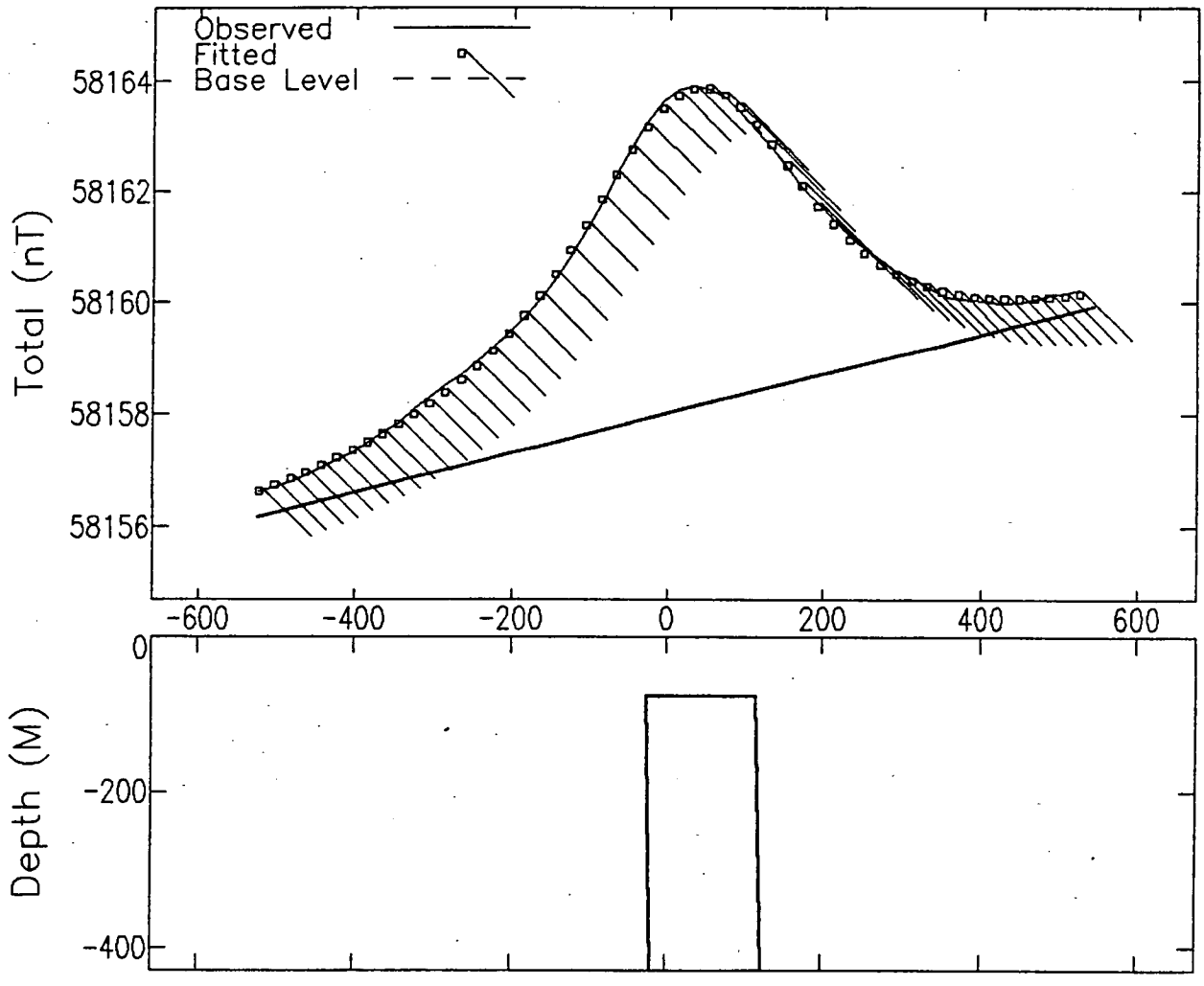
Field Strength	58000 nT
Inclination	74 deg
Declination	18 deg

COORDINATES:

Sensor Height	100 M
Strike Perp	90 deg
Line Direction	90 deg
Main Direction	90 deg
Main Offset	444500 M
Cross Direction	0 deg
Cross Offset	5475000 M

ANOMALY G6W

10601L 01



MODEL PARAMETERS:

Model Type		Tabular2
Depth	F	75.6 M
Half Width	F	71.4 M
Half Length	X	400 M
Offset	X	50.0 M
Dip	F	89 deg
Thickness	F	10317 M
Susceptibility	F	.0000753 emu
Remnance Ratio	X	0
Remnance Incl	X	0 deg
Remnance Decl	X	0 deg
Main Position	F	45.22137 M
Cross Position	X	72.27348 M
Base Level	F	58158.19 nT
Base Slope	F	.0035278 nT/M
Base Curvature	X	0 nT/M2

(F-fitted, X-fixed, L-limit)

GEOMAGNETIC FIELD:

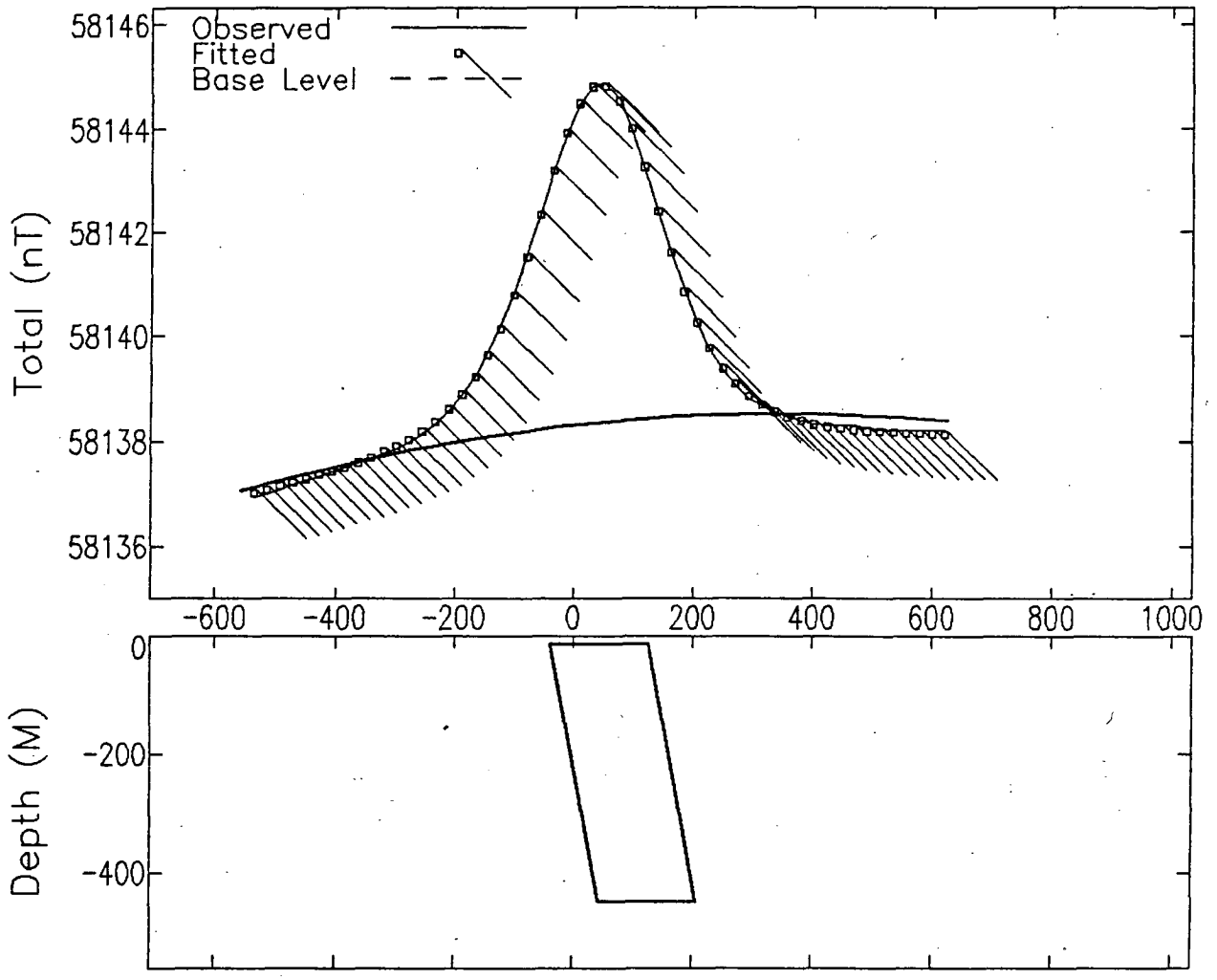
Field Strength	58160 nT
Inclination	74 deg
Declination	18 deg

COORDINATES:

Sensor Height	100 M
Strike Perp	90 deg
Line Direction	92 deg
Main Direction	90 deg
Main Offset	440500 M
Cross Direction	0 deg
Cross Offset	5472700 M

ANOMALY G7, PRISM

10550L 01



MODEL PARAMETERS:

Model Type		Tabular2
Depth	F	13.0 M
Half Width	F	81.9 M
Half Length	X	300 M
Offset	X	0 M
Dip	F	79 deg
Thickness	F	434 M
Susceptibility	F	.0000603 emu
Remnance Ratio	X	0
Remnance Incl	X	0 deg
Remnance Decl	X	0 deg
Main Position	F	43.85833 M
Cross Position	X	-217.6297 M
Base Level	F	58138.36 nT
Base Slope	X	.0010964 nT/M
Base Curvature	X	-.0000018 nT/M2

(F-fitted, X-fixed, L-limit)

GEOMAGNETIC FIELD:

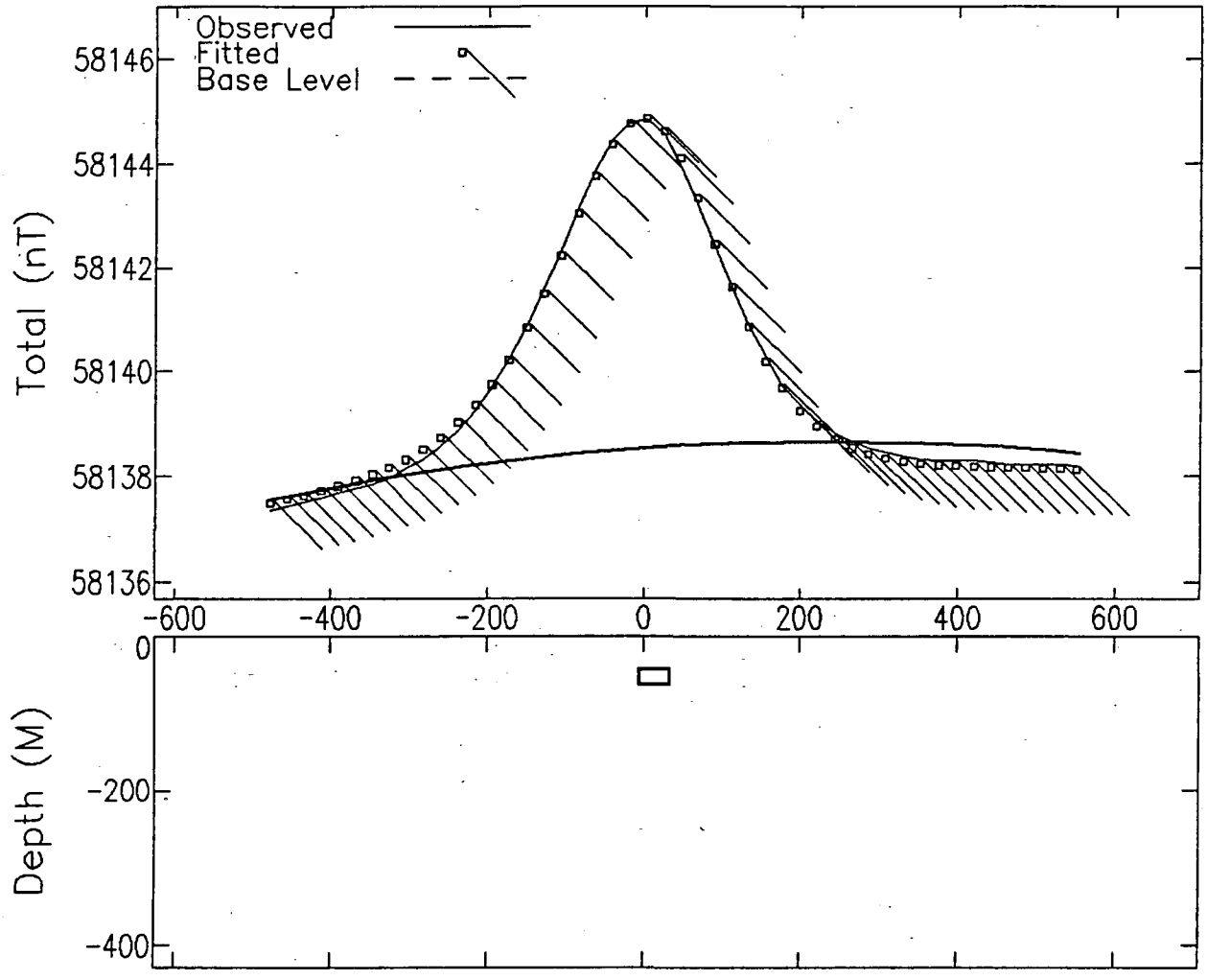
Field Strength	58138 nT
Inclination	74 deg
Declination	18 deg

COORDINATES:

Sensor Height	100 M
Strike Perp	85 deg
Line Direction	89 deg
Main Direction	90 deg
Main Offset	442800 M
Cross Direction	0 deg
Cross Offset	5469000 M

ANOMALY G7 - BRIDGE MODEL

10550L 01



MODEL PARAMETERS:

Model Type		Tabular2
Depth	F	43.5 M
Half Width	X	20.0 M
Half Length	X	275 M
Offset	X	300 M
Dip	X	90 deg
Thickness	X	20.0 M
Susceptibility	F	0.00467 emu
Remnance Ratio	X	0
Remnance Incl	X	0 deg
Remnance Decl	X	0 deg
Main Position	F	13.96059 M
Cross Position	X	581.8653 M
Base Level	F	58138.55 nT
Base Slope	X	.0009618 nT/M
Base Curvature	X	-.0000021 nT/M2

(F-fitted, X-fixed, L-limit)

GEOMAGNETIC FIELD:

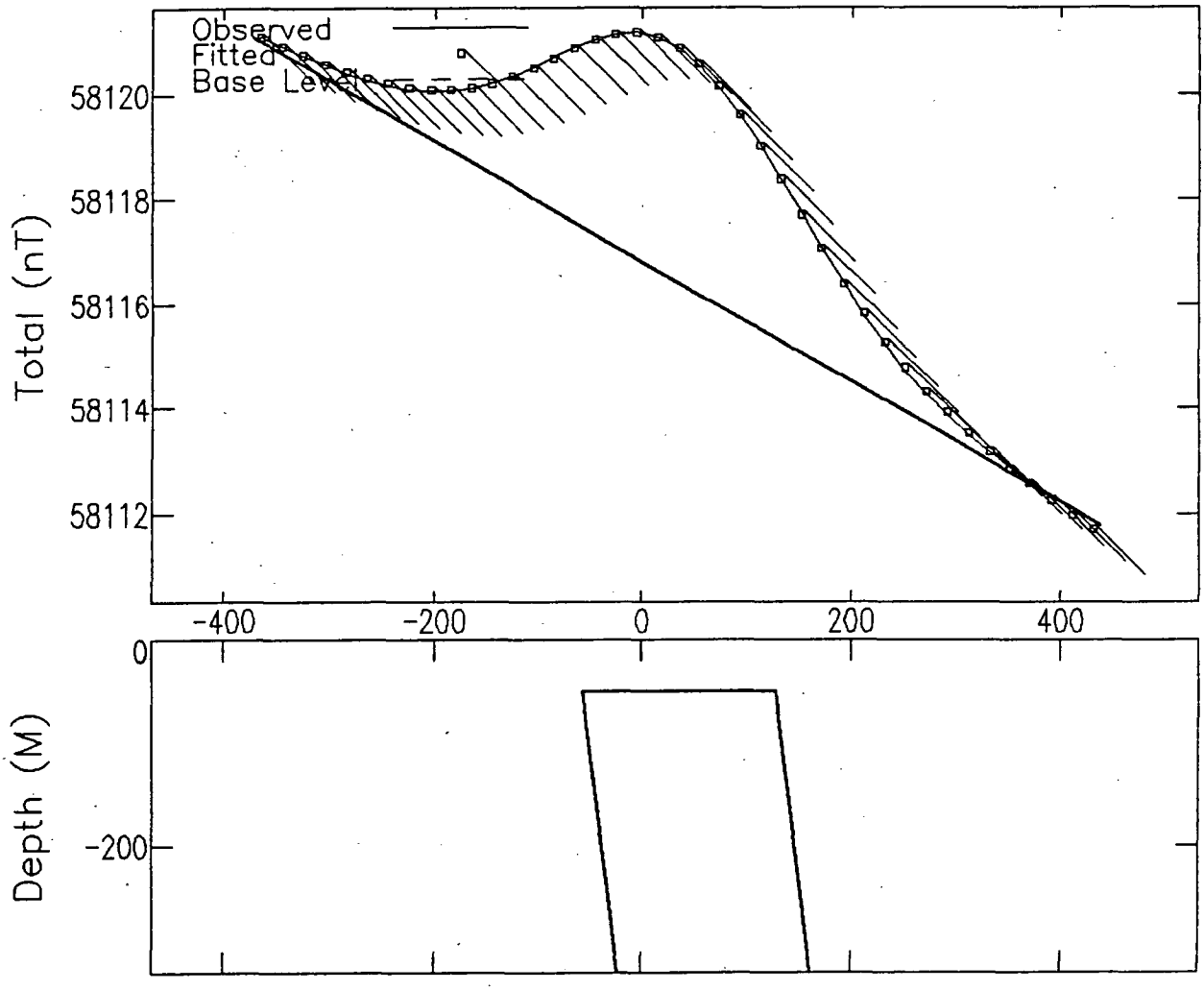
Field Strength	58138 nT
Inclination	74 deg
Declination	18 deg

COORDINATES:

Sensor Height	150 M
Strike Perp	85 deg
Line Direction	88 deg
Main Direction	90 deg
Main Offset	442850 M
Cross Direction	0 deg
Cross Offset	5468200 M

ANOMALY H7

10520L 01



MODEL PARAMETERS:

Model Type		Tabular2
Depth	X	50.0 M
Half Width	F	92.5 M
Half Length	X	350 M
Offset	X	-100 M
Dip	F	83 deg
Thickness	F	524 M
Susceptibility	F	.0000526 emu
Remnance Ratio	X	0
Remnance Incl	X	0 deg
Remnance Decl	X	0 deg
Main Position	F	34.99605 M
Cross Position	X	290.053 M
Base Level	X	58116.41 nT
Base Slope	X	-.0115 nT/M
Base Curvature	X	0 nT/M2

(F-fitted, X-fixed, L-limit)

GEOMAGNETIC FIELD:

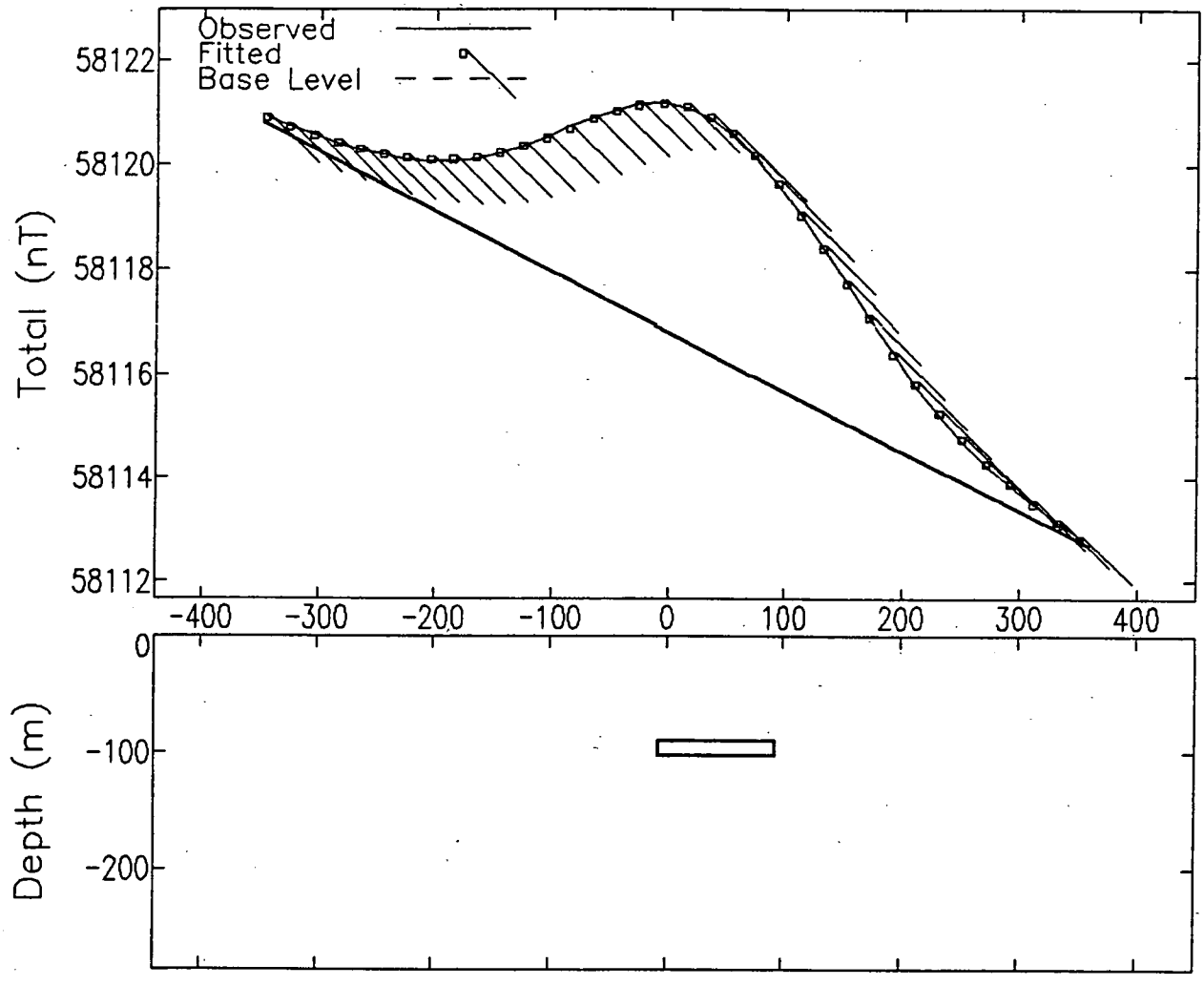
Field Strength	58115 nT
Inclination	74 deg
Declination	18 deg

COORDINATES:

Sensor Height	100 M
Strike Perp	90 deg
Line Direction	90 deg
Main Direction	90 deg
Main Offset	446000 M
Cross Direction	0 deg
Cross Offset	5466000 M

ANOMALY H7 - BLDG MODEL

10520L 01



MODEL PARAMETERS:

Model Type		Tabular2
Depth	F	89.8 m
Half Width	X	50.0 m
Half Length	X	75.0 m
Offset	X	150 m
Dip	X	90 deg
Thickness	X	12.0 m
Susceptibility	F	0.00591 emu
Remnance Ratio	X	0
Remnance Incl	X	0 deg
Remnance Decl	X	0 deg
Main Position	F	43.17919 m
Cross Position	X	291.0466 m
Base Level	F	58116.31 nT
Base Slope	F	-.0114747 nT/m
Base Curvature	X	0 nT/m2

(F-fitted, X-fixed, L-limit)

GEOMAGNETIC FIELD:

Field Strength	58117 nT
Inclination	74 deg
Declination	18 deg

COORDINATES:

Sensor Height	150 m
Strike Perp	90 deg
Line Direction	90 deg
Main Direction	90 deg
Main Offset	446000 m
Cross Direction	0 deg
Cross Offset	5466000 m

TAKLA STAR RESOURCES LTD.

LEGEND CLAM GROUP, ALBERTA
GSC AEROMAGNETIC SURVEY
VERTICAL GRADIENT
of the magnetic field

WATSON CONSULTING, TORONTO

Scale 1:50000
(metres)
0 1000 2000 3000

EULER SOLUTIONS - BY DEPTH
0 - 100m
100 - 200m
200 - 300m

EULER DECONVOLUTION SPECIFICATIONS
Index - 1.8
Grid size - 600m
Error cutoff - 10%

Gammas/m
times 100

L 1200 E
L 1190 E
L 1180 E
L 1170 E
L 1160 E
L 1150 E
L 1140 E
L 1130 E
L 1120 E

111°45'W
112°00'W
112°15'W

49°20'N
49°25'N
49°30'N
49°35'N

L 10460 N
L 10471 N
L 10480 N
L 10490 N
L 10500 N
L 10510 N
L 10520 N
L 10530 N
L 10540 N
L 10550 N
L 10560 N
L 10570 N
L 10580 N
L 10590 N
L 10601 N
L 10610 N
L 10620 N
L 10640 N
L 10650 N
L 10660 N
L 10670 N
L 10680 N
L 10690 N
L 10700 N
L 10710 N
L 10721 N
L 10730 N
L 10740 N
L 10750 N
L 10760 N
L 10770 N
L 10780 N
L 10790 N
L 10800 N
L 10810 N
L 10820 N
L 10830 N
L 10840 N
L 10850 N
L 10860 N
L 10870 N
L 10890 N
L 10900 N
L 10910 N
L 10920 N
L 10930 N

5465000N
5470000N
5475000N
5480000N
5485000N
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5495000N
5500000N

450000E
445000E
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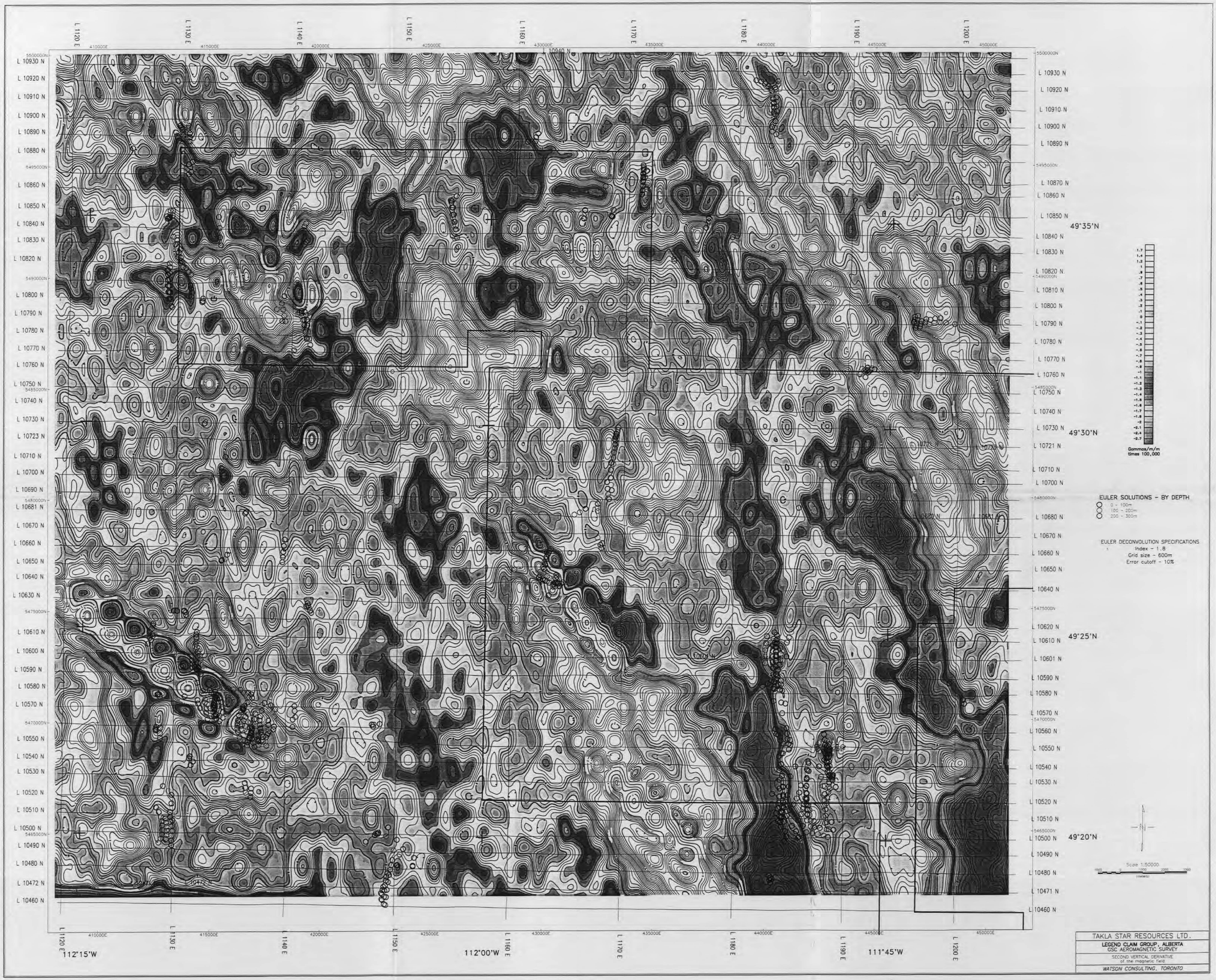
415000E
410000E


L 1120 E
L 1130 E
L 1140 E
L 1150 E
L 1160 E
L 1170 E
L 1180 E
L 1190 E
L 1200 E
410000E
415000E
420000E
425000E
430000E
435000E
440000E
445000E
450000E
5500000N
5495000N
5490000N
5485000N
5480000N
5475000N
5470000N
5465000N
L 10940 N
L 10930 N
L 10920 N
L 10910 N
L 10900 N
L 10890 N
L 10880 N
L 10870 N
L 10860 N
L 10850 N
L 10840 N
L 10830 N
L 10820 N
L 10810 N
L 10800 N
L 10790 N
L 10780 N
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L 10760 N
L 10750 N
L 10740 N
L 10730 N
L 10723 N
L 10721 N
L 10710 N
L 10700 N
L 10690 N
L 10681 N
L 10680 N
L 10670 N
L 10660 N
L 10650 N
L 10640 N
L 10630 N
L 10620 N
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L 10601 N
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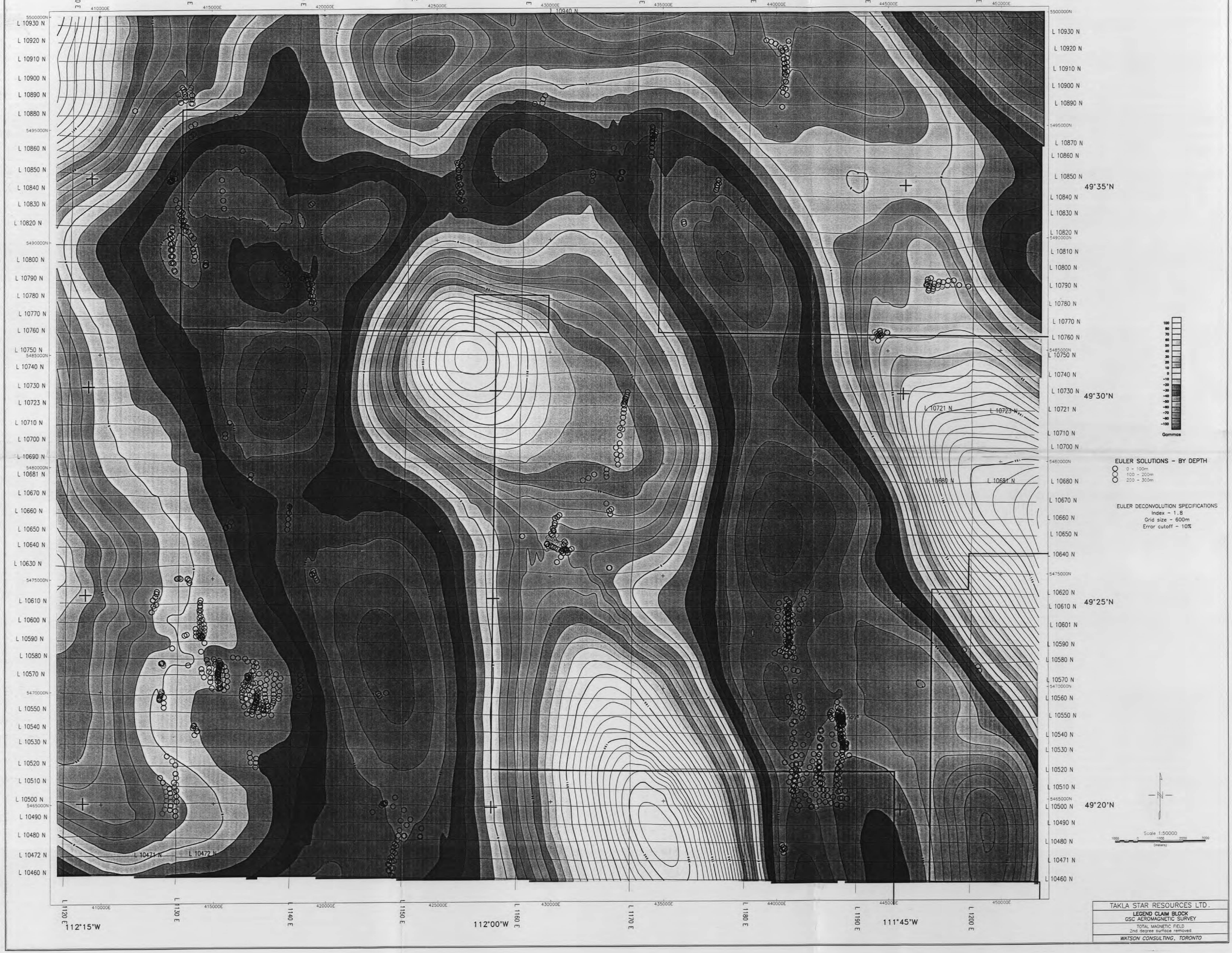
L 10580 N
L 10570 N
L 10560 N
L 10550 N
L 10540 N
L 10530 N
L 10520 N
L 10510 N
L 10500 N
L 10490 N
L 10480 N
L 10472 N
L 10471 N
L 10460 N
49°35'N
49°30'N
49°25'N
49°20'N
112°15'W
112°00'W
111°45'W
Gammas/m/m
times 100,000
EULER SOLUTIONS - BY DEPTH
0 - 100m
100 - 200m
200 - 300m
EULER DECONVOLUTION SPECIFICATIONS
Index - 1.8
Grid size - 600m
Error cutoff - 10%
Scale 1:50000
(meters)
TAKLA STAR RESOURCES LTD.
LEGEND CLAIM GROUP, ALBERTA
GSC AEROMAGNETIC SURVEY
SECOND VERTICAL DERIVATIVE
of the magnetic field
WATSON CONSULTING, TORONTO



TAKLA STAR RESOURCES LTD.

LEGEND CLAIM BLOCK
GSC AEROMAGNETIC SURVEY

TOTAL MAGNETIC FIELD
2nd degree surface removed

WATSON CONSULTING, TORONTO

Report on the Field Reconnaissance for the Reprocessed GSC Aeromagnetic Data of the Legend Block

prepared for

Takla Star Resources
and
Fairstar Exploration

By

D. I. SRAEGA, Geologist
Edmonton, Alberta

April 1994

Introduction

The GSC 1992 aeromagnetic survey data for the western portion of the Legend Block of Alberta was reprocessed by Roger K. Watson , P. Eng. of Toronto. The reprocessing included total field, first derivative, second derivative and Euler deconvolution. Thirteen anomalies were defined and modeled to estimate the potential depth, width and dip of each anomaly.

Follow up of aeromagnetic anomalies included checking 1:250 000 topographic maps and airphotos against defined anomalies from the GSC reprocessed data. Anomalies not correlated with any map or airphoto feature were followed up by ground survey and ERCB database. The airphotos for the Legend block were shot during August of 1992 and 1:250 000 maps are current to mid 1970's. The GSC aeromagnetic data was collected during September and October of 1992. Flight lines were at 800m spacing at 150m mean terrain clearance.

This report details the surface follow up of anomalous sites, defines the potential anomaly source(s) and defines anomalies for follow up as suspect kimberlite like magnetic anomalies. Field follow up of magnetic anomalies included site inspection utilizing mobile GPS, prospecting of local area and some samples along Etzikom Coulee. Samples were panned down and concentrated for visual inspection.

Airphoto Interpretation and Ground Follow Up

Anomaly B2ne (UTM 419750E 5494750N, Airphotos LN-14 no. 18-19)

The anomaly is on the north side of Chin Lakes Reservoir 3.2 km above the dam. The anomaly corresponds to a circulating sprinkler system as seen on the air photos.

Anomaly D2w (UTM 4250900E 5493100N, Airphotos LN-14 no. 20-21)

The anomaly is 3 km east of Chin Lakes dam. The map produced in 1975 shows one well while the airphotos taken in 1992 show multiple wells in the area.

Anomaly B3e (UTM 4194000E 5489000N, Airphotos LN-14 no. 18-19)

Anomaly is 3.5 km southeast of Chin Lakes dam. The anomaly is associated with a battery of oil wells.

Anomaly E2s (UTM 431750E 5491250N, Airphotos LN-14 no. 23-24)

Anomaly is 3.5 km southeast of Chin Coulee dam and the airphotos taken in 1992 indicate evidence of culture. A battery of oil wells is immediately to the northeast and airphotos indicate culture over the anomaly

Anomaly E2n (UTM 4327500E 54912500N, Airphotos LN-3 no. 92-93)

Anomaly is associated with oil wells 3.5 km north of Chin Coulee. The oil wells are visible on 1992 airphotos to the northeast.

Anomaly E4 (UTM 433000E 5482600N, Airphotos LN-12 no. 71-72)

The anomaly is not related to any cultural feature on the topographic map on the air photo as seen from air photos. Ground follow up revealed a new oil well and a tank. The oil well is 14-23-6-15W4 (N 49° 29.652' W 111° 55.578') and is owned by Newtec.

Anomaly D6ne (UTM 4287000E 5474400N, Airphotos LN-11 no. 255-256)

The anomaly is associated with oilfield tanks seen in airphotos but not marked on the 1975 topographic map. Ground follow up revealed eleven wells visible in the area.

Anomaly F6n (UTM 436800E 5474250N, Airphotos LN-11 no. 252-253)

The anomaly coincides with farm buildings as seen on air photos. Ground follow up revealed the farm buildings were grain storage silos made of wood with some metal reinforcing rods. The Chin Coulee Gas Co-Op pipeline passes 100m north of the farm buildings running east-west. The area is flat with crops rotating from wheat to fallow. The ERCB has record of only one well in the LSD drilled in 1944 which was never cased and is south of the anomaly. **A ground total field magnetic survey is recommended for this area**

Anomaly G5se (UTM 444500E 5476400N, Airphoto LN-11 no. 256-257)

The anomaly is along the township road with no other cultural landmarks present in the area from topographic maps and airphotos. Ground follow up shows no cultural features. ERCB records indicate a well was drilled at 14 36 5 14W4 cased and abandoned in 1985. Two water wells were also drilled on a farm 200m west of the magnetic anomaly

Anomaly G7 (UTM 442850E 5468750N, Airphotos LN-10 no. 138-139)

The anomaly is associated with the road crossing Etzikom Coulee.

Anomaly H7 (UTM 446000E 5466500N, Airphotos LN-9 no.14-15)

The anomaly is associated with a farm south of Etzikom Coulee.

Conclusions

Currently only anomaly F6n is has no cultural landmarks found which could potentially generate an anomaly. The anomaly is recommended for ground total field magnetic survey or a small airborne program. The anomaly is found between two flight lines and the anomaly may shift or represent two separate sources. The ground survey in this area would ideally include at least two square miles of survey.

Appendix
ERCB Computer Printouts on Well Sites

WELL ID : 00/14-36-005-14W4/0 COSEKA ET AL SKIFF 14-36-5-14
LICENSE NO. : 0115377 LICENSEE: 0N170 COSEKA RES
LICENSE DATE: 14 JUN 1985 AGENT :
CONTRACTOR CODE: 0Y61 RIG NO : 0002

BASIC DRILLHOLE DATA

FIELD : 998 UNDEFINED
POOL :
GS AREA :
DEPOSIT :
LAHEE CLASS: 25 NEW POOL WILDCAT IEW
WELL STATUS: 00 02 00 00
ABD
STATUS DATE: 22 JUN 1985

DEPTHS (M)
TOTAL: 976.00 SS: -52.50
PB : SS:
TVD : SS:
CONF : (NC)

DATES
SPUD : 17 JUN 1985
FIN-DRILL: 21 JUN 1985
RIG REL. : 22 JUN 1985
ON PROD. :
ON INJ. :

CO-OR--	---LONGITUDE----	---LATITUDE---	--ELEV (M)---	
S 40.0	ACT: 111.765197	ACT: 49.435166	GRD:	919.50
E 780.0	THE:	THE:	KB :	923.50
			CF :	

BOTTOM HOLE CO-ORDINATES = SURFACE CO-ORDINATES

WELL ID : 00/14-36-005-14W4/0 COSEKA ET AL SKIFF 14-36-5-14
LICENSE #: 0115377 LICENSE DATE: 14 JUN 1985

---------- APPLICANT/AGENT/CONTRACTOR ----------

LICENSEE: 0N170 COSEKA RESOURCES LIMITED
C/O NORTH CDN OILS LTD., 700, 112 - 4 AVENUE S.W.
CALGARY ALBERTA T2P4B2

AGENT:

DRILLING
CONTRACTOR: 0Y610 BODOR DRILLING LTD
RIG NUMBER: 0002

---------- SURFACE/MINERAL RIGHTS OWNERSHIP ----------

SURFACE RIGHTS OWNER: 2 FREEHOLD HEAD LESSOR: 1 CROWN
AGREEMENT TYPE: 004 5 YEAR PLAINS PETROLEUM & NATURAL GAS LEASES
AGREEMENT NO: 0482040167 EXPIRY DATE:

DDN0604-01 ENERGY RESOURCES CONSERVATION BOARD 27 APR 1994
DATA DISSEMINATION - GENERAL QUERY

WELL ID : S0/03-30-005-14W4/0 DOMIN OIL 72CHIN COULEE TH 3-30-5-14
LICENSE NO. : B0000568 LICENSEE: 07630 DOMINION OIL
LICENSE DATE: 6 JAN 1944 AGENT :
CONTRACTOR CODE: RIG NO :

BASIC DRILLHOLE DATA

FIELD : 998 UNDEFINED
POOL :
OS AREA :
DEPOSIT :
LAHEE CLASS: 12 TEST HOLE
WELL STATUS: 00 02 00 00
ABD
STATUS DATE: 6 JAN 1944

DEPTHS (M)
TOTAL: 160.00 SS: 741.60
PB : SS:
TVD : SS:
CONF : (NC)

DATES
SPUD : 6 JAN 1944
FIN-DRILL: 6 JAN 1944
RIG REL. :
ON PROD. :
ON INJ. :

--CO-OR--	---LONGITUDE----	---LATITUDE---	--ELEV (M)---
S 1619.3	ACT: 111.877523	ACT: 49.406663	GRD: 901.60
E 761.9	THE:	THE:	KB : 901.60
			CF :

BOTTOM HOLE CO-ORDINATES = SURFACE CO-ORDINATES

Section 30 near Fbn

WELL ID : 00/14-36-005-14W4/0
COSEKA ET AL SKIFF 14-36-5-14
LICENSE #: 0115377
LOG REQUEST CODE: S

FIN-DRILL-DATE: 21 JUN 1985
KB: 923.50 M
CORE ANALYSED: NO

LOG DATA

RUN NO.	RUN ---DATE----	CO. CODE		LOG TYPE	INTERVAL (M) --TOP--	--BASE--
1	21 JUN 1985	HIST	0504	BHC SONIC	192.20 -	975.20
	21 JUN 1985	HIST	0621	COMP NEUTRON FORM DENSITY	192.20 -	976.20
1	21 JUN 1985	HIST	0703	DUAL INDUCTION SPHER-FOC	192.20 -	976.20
2	22 JUN 1985	HIST	4101	CEMENT PLUG	85.00 -	621.00

Magnetic Anomaly G5 SE

WELL ID : 00/14-36-005-14W4/0 COSEKA ET AL SKIFF 14-36-5-14
LICENSE #: 0115377 KB: 923.50 M TD: 976.00 M

CASING AND CEMENTING

----- 1 ----

OBSERVATION DATE.: 18 JUN 1985
CASING TYPE . . .: SURFACE
CASING SIZE(MM) .: 219.1
SHOE SET (M). . .: 190.00
LINER TOP (M) . .:
CASING DEN(KG/M3): 35.7
GRADE(STEEL PROC): J
GRADE (STRENGTH).: 55
COLLAR TYPE . . .:
MIX STRING. . . .: NO

------ 1 -----

CEMENT STAGE NO .:
CEMENT AMOUNT . .: 14.0 TONNES
CEMENT TYPE . . .: CLASS G NEAT
RE-CEMENT . . . .: NO

WELL ID : 00/14-36-005-14W4/0 COSEKA ET AL SKIFF 14-36-5-14
LICENSE #: 0115377 KB: 923.50 TD: 976.00
FIRST DRILL DATE : 21 JUN 1985 GEO INT DATE :
GEO REVISED DATE: 02 DEC 1986 GEO INT BY :

GEOLOGICAL TOPS & MARKERS - LOG

	FORMATION	DEPTH (M)	SUB SEA (M)	QUALITY	DESCRIPTION
1860	SECOND WHITE SPECKLED SH	525.00	398.50	LOGS,GOOD	TOP
2060	BASE FISH SCALES ZONE	602.20	321.30	LOGS,GOOD	TOP
2120	BOW ISLAND FM	637.50	286.00	LOGS,GOOD	TOP
2130	BOW ISLAND SD	652.00	271.50	LOGS,GOOD	TOP
2780	MANNVILLE GRP	769.00	154.50	LOGS,GOOD	TOP
3520	SUNBURST SD	889.00	34.50	LOGS,GOOD	TOP
4240	RIERDON FM	911.00	12.50	LOGS,GOOD	TOP
4280	SAWTOOTH FM	941.00	-17.50	LOGS,GOOD	TOP
6280	LIVINGSTONE FM	962.50	-39.00	LOGS,GOOD	TOP
9999	TOTAL DEPTH	976.00	-52.50		

DN0604-01 ENERGY RESOURCES CONSERVATION BOARD 27 APR 1994
DATA DISSEMINATION - GENERAL QUERY

WELL ID : F3/13-36-005-14W4/0 FLORCHINGER SKIFF DWW 13-36-5-14
LICENSE NO. : 0032755 LICENSEE: 0FF30 DOMESTIC W. W.
LICENSE DATE: 14 SEP 1974 AGENT :
CONTRACTOR CODE: RIG NO :

---------- BASIC DRILLHOLE DATA ----------

FIELD : 998 UNDEFINED -------- DEPTHS (M) ---------
POOL : 158098 MILK RIVER UND TOTAL: 183.00 SS: -183.00
GS AREA : PB : SS:
DEPOSIT : TVD : SS:
LAHEE CLASS: 09 OTHER CONF : (NC)
WELL STATUS: 06 00 08 00
WATER FARM ------- DATES --------
STATUS DATE: 14 SEP 1967 SPUD : 14 SEP 1967
FIN-DRILL: 14 SEP 1967
--CO-OR-- ---LONGITUDE---- ---LATITUDE--- --ELEV (M)--- RIG REL. : 14 SEP 1967
S 152.4 ACT: 111.773851 ACT: 49.434171 GRD: ON PROD. : 14 SEP 1967
E 152.4 THE: THE: KB : ON INJ. :
CF :
BOTTOM HOLE CO-ORDINATES = SURFACE CO-ORDINATES

Water Wells near G5 5c

DN0604-01 ENERGY RESOURCES CONSERVATION BOARD 27 APR 1994
DATA DISSEMINATION - GENERAL QUERY

WELL ID : F1/13-36-005-14W4/0 FLORCHINGER SKIFF DWW 13-36-5-14
LICENSE NO. : 0030590 LICENSEE: 0FF30 DOMESTIC W. W.
LICENSE DATE: 21 JUN 1966 AGENT :
CONTRACTOR CODE: — RIG NO :

---------- BASIC DRILLHOLE DATA ----------

FIELD : 998 UNDEFINED
POOL : 158098 MILK RIVER UND
GAS AREA :
DEPOSIT :
LAHEE CLASS: 09 OTHER
WELL STATUS: 06 00 08 00
WATER FARM
STATUS DATE: 21 JUN 1966

-------- DEPTHS (M) ---------
TOTAL: 183.00 SS: -183.00
PB : SS:
TVD : SS:
CONF : (NC)

------- DATES --------
SPUD : 21 JUN 1966
FIN-DRILL: 21 JUN 1966
RIG REL. : 21 JUN 1966
ON PROD. : 21 JUN 1966
ON INJ. :

-CO-OR-- ---LONGITUDE---- ---LATITUDE--- --ELEV (M)---
N 201.0 ACT: 111.773181 ACT: 49.433733 GRD:
E 201.0 THE: THE: KB :
CF :

BOTTOM HOLE CO-ORDINATES = SURFACE CO-ORDINATES

Water Wells G 5 sc

Appendix III

Description of Location of Permits

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030557

AGGREGATE AREA:

8 704 HECTARES

DESCRIPTION OF LOCATION:

4-13-004: 2-7;9;10;15-19;30;31
4-13-005: 6;7;18;19;30;31
4-13-006: 5-7;9;16-20;29-32

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030558

AGGREGATE AREA:

8 256 HECTARES

DESCRIPTION OF LOCATION:

4-12-005: 9-11;13-16;21-25;27;28;33-36
4-12-006: 1-4;10-14;23-25;26NE;35;36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030559

AGGREGATE AREA:

8 704 HECTARES

DESCRIPTION OF LOCATION:

4-14-005: 1-7;9-25;27-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030560

AGGREGATE AREA:

8 704 HECTARES

DESCRIPTION OF LOCATION:

4-15-005: 1-7;9-25;27-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030561

AGGREGATE AREA:

8 768 HECTARES

DESCRIPTION OF LOCATION:

4-12-006: 9;15-22;27-34
4-13-006: 10-15;21-25;26NE;27;28;33-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030562

AGGREGATE AREA:

8 768 HECTARES

DESCRIPTION OF LOCATION:

4-14-006: 1-7;9-25;26NE;27-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030563

AGGREGATE AREA:

8 768 HECTARES

DESCRIPTION OF LOCATION:

4-15-006: 1-7;9-25;26NE;27-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030564

AGGREGATE AREA:

8 768 HECTARES

DESCRIPTION OF LOCATION:

4-12-007: 1-7;9-25;26NE;27-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030675

AGGREGATE AREA:

8 000 HECTARES

DESCRIPTION OF LOCATION:

4-15-007: 1-3;7;9-25;26NE;27-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030676

AGGREGATE AREA:

8 768 HECTARES

DESCRIPTION OF LOCATION:

4-16-007: 1-7;9-25;26NE;27-36

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030677

AGGREGATE AREA:

7 982.73 HECTARES

DESCRIPTION OF LOCATION:

4-16-009: 1-6;9SW;10-12;14-16;17SE;18;20;22;23L13-L16;24;26NE;28;29;
33S,NW;34;36
4-16-010: 2S,NEP
PORTION(S) LYING TO THE NORTH AND SOUTH OF THE RIGHT OF WAY AND STATION GROUNDS OF THE CANADIAN PACIFIC RAILWAY AS SHOWN ON PLAN R.Y. 21.
2L11P,L12P,L14NE,L14SEP,L14SWSE,L14SWNE,L14NWSE,L14NWNE;
3EP,NW
PORTION(S) LYING TO THE NORTH AND SOUTH OF THE RIGHT OF WAY OF THE SAID RAILWAY AS SHOWN ON THE SAID PLAN.
3L3P
PORTION(S) DESCRIBED AS THE NORTHERLY 251.46 METRES.
L5P
PORTION(S) BEING THE RIGHT OF WAY LYING TO THE NORTH AND SOUTH OF THE SAID RAILWAY AS SHOWN ON THE SAID PLAN.
L6P
PORTION(S) LYING TO THE SOUTH OF THE SAID RAILWAY AND THE RIGHT OF WAY LYING TO THE NORTH OF THE SAID RAILWAY AS SHOWN ON THE SAID PLAN.
4NE,SEP
PORTION(S) LYING TO THE NORTH AND SOUTH OF THE RIGHT OF WAY AND STATION GROUNDS OF THE SAID RAILWAY AS SHOWN ON THE SAID PLAN.
7L13SESE,L13SESW,L13SWSE,L13SWSW,L14P
PORTION(S) DESIGNATED AS BELLY RIVER.
9N,SW;10-12;14;16;17;18NW,SWP,NEP,L2P
PORTION(S) LYING TO THE NORTH AND WEST OF THE RIGHT BANK OF THE SAID RIVER.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030678

AGGREGATE AREA:

8 925.586 HECTARES

DESCRIPTION OF LOCATION:

4-15-010: 1-6;7SP,NW,NEP;8SE,NEP;9S,NP;10-12;13SP,NE,NWP;14SP, NW,NEP;15N,SP;16N,SW,SEP;17-25;26E;27-36
PORTION(S) LYING TO THE NORTH AND SOUTH OF THE RIGHT OF WAY OF THE CANADIAN PACIFIC RAILWAY AS SHOWN ON PLAN R.Y. 22908.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030679

AGGREGATE AREA:

6 965.58 HECTARES

DESCRIPTION OF LOCATION:

4-15-011: 1-6;7NP,SW,SEP
PORTION(S) LYING TO THE SOUTH AND WEST OF THE LEFT BANK OF THE BELLY RIVER.
8N,SP
PORTION(S) LYING OUTSIDE THE SAID RIVER.
9SP,NEP;10S,NE,NWP;11S,NE,NWP
PORTION(S) LYING TO THE SOUTH AND EAST OF THE LEFT BANK OF THE SAID RIVER.
12;13S,NE,NWP
PORTION(S) LYING TO THE SOUTH OF THE LEFT BANK OF THE SAID RIVER.
14SP,NE,NWP;15SP
PORTION(S) LYING TO THE SOUTH AND EAST OF THE LEFT BANK OF THE SAID RIVER.
18L4P
PORTION(S) DESIGNATED AS THE SAID RIVER.
23SP;24SP;26S,NW
PORTION(S) LYING TO THE SOUTH AND EAST OF THE LEFT BANK OF THE SAID RIVER.
4-16-010: 19NP,SE,SWP;20NW;22;24;25;26NE;27-29
PORTION(S) LYING TO THE EAST OF THE LEFT BANK OF THE SAID RIVER.
30N,SW,SEP;31;32;34-36
PORTION(S) LYING TO THE WEST OF THE RIGHT BANK OF THE SAID RIVER.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

APPENDIX

TO

METALLIC AND INDUSTRIAL MINERALS PERMIT NO. 9393030680

AGGREGATE AREA:

9 072.44 HECTARES

DESCRIPTION OF LOCATION:

4-16-012: 1;2N,SE,SWP;3N,SP
PORTION(S) LYING TO THE NORTH OF THE RIGHT BANK OF THE BELLY RIVER.
4N,SP;5-36
PORTION(S) LYING TO THE NORTH AND WEST OF THE RIGHT BANK OF THE SAID RIVER.

PERMITTED SUBSTANCES:

METALLIC AND INDUSTRIAL MINERALS

SPECIAL PROVISIONS:

NIL

Appendix IV

Statement of Expenditures

TAKLA STAR RESOURCES LTD.
STATEMENT OF EXPENDITURES
DECEMBER 31, 1994
LEGEND BLOCK

	LEGEND
GEOPHYSICAL SURVEY COSTS	
FIELD STAFF EXPENSES	
ACCOUNTING FEES	
SUPPLIES	8.20
COMMUNICATIONS	
DELIVERY AND FREIGHT	
TRAVEL AND ACCOMODATION	39.25
AUTOMOTIVE EXPENSE	152.69
CONSULTING FEES	
GEOPHYSICAL CONTRACTS	3,702.94
EQUIPMENT EXPENSE	
EQUIPMENT RENTAL	
MEALS/ENTERTAINMENT/SUSTENANCE	20.81
REFERENCE MATERIALS	24.60
ASSAYING	
FIELD STAFF WAGES	1,887.92
MANAGEMENT SALARIES	
SUBTOTAL	5,836.41
OVERHEAD COMPONENT - 15%	875.46
TOTAL GEOPHYSICAL SURVEY COSTS	**6,711.87**
GEOCHEMICAL SURVEY COSTS	
FIELD STAFF EXPENSES	415.59
ACCOUNTING FEES	240.00
SUPPLIES	2.97
COMMUNICATIONS	47.62
DELIVERY AND FREIGHT	0.00
TRAVEL AND ACCOMODATION	3.93
AUTOMOTIVE EXPENSE	537.65
CONSULTING FEES	0.00
GEOPHYSICAL CONTRACTS	0.00
EQUIPMENT EXPENSE	1,871.08
EQUIPMENT RENTAL	0.00
MEALS/ENTERTAINMENT/SUSTENANCE	24.85
REFERENCE MATERIALS	3.20
ASSAYING	3,697.40
FIELD STAFF WAGES	2,497.77
MANAGEMENT SALARIES	248.00
	9,590.06
OVERHEAD COMPONENT - 15%	1,438.51
TOTAL GEOCHEMICAL SURVEY COSTS	**11,028.57**
GRAND TOTALS	**17,740.44**

Compiled by L.R. Abrams, CMA