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GOLDEN BEAR PROJECT

NORTH AMERICAN METALS CORP.
CHEVRON MINERALS LTD.
JOINT VENTURE

1991 EXPLORATION REPORT
DECEMBER 20, 1991

BY

J.M. SMITH M.Sc.
D.A. McBEAN B.Sc.
K.P. DIXON B.Sc.
D.G. REDDY M.Sc.
B.W.R. McDONALD M.Sc.

GOLDEN BEAR PROJECT
1991 Exploration

Executive Summary

This report provides details of the 1991 exploration program and recommendations for 1992 exploration work on the Golden Bear Mine property. Golden Bear Mine is a 50%-50% joint venture project between North American Metals Corp. (NAMC) and Chevron Minerals Ltd. (CML). North American Metals Corp. is the project operator. Homestake Mining (B.C.) Limited (now 175595 Canada Inc.) holds a majority ownership of NAMC. The 1991 Golden Bear exploration program had a total expenditure of $1.2M as of December 31, 1991.

Exploration fieldwork on the Golden Bear Mine property between May 8th and September 16th, 1991 focused on the Bear Fault and other parallel north striking structures. The exploration program included pre-field season data compilation and longitudinal section construction. On-site work included re-logging drill core, claim staking in two areas, diamond drilling in three areas, Troy Ridge grid establishment, 1:1000 scale grid mapping, 1:5000 scale mapping, rock chip and channel sampling, and contour soil sampling.

Pre-season work focused on data compilation of surface plan maps and on construction of longitudinal sections through Bear South, Bear North and Troy Ridge areas. Re-logging all drill core south of 25200N was completed on site prior to drilling.

The TANGENT claims were staked on the southeast corner of the Golden Bear Property to cover possible southward extensions of the Ultramafic Fault and Ophir Break structures. Several samples were collected along claim lines during staking. The highest assay result was 0.62 g/t Au, 13.6g/t Ag, 9700ppm Cu for a quartz vein bearing copper sulphide mineralization.

The EL fraction claim was staked on the eastern edge of the Golden Bear claim block to cover a claim gap existing between the EL 2, EL 3 and HORN 1 claims (of the Golden Bear Property) and the EPI 3 claim.

Troy Ridge grid was established for 1:1,000 scale mapping. Mapping defined the relative positions of the Bear Fault, the Footwall Fault and the West Wall Fault and outlined the outcrop exposure of two carbonate bodies exposed on Troy Ridge. The highest assay from Troy Ridge rock sampling was 1.06 g/t Au, 1.20 g/t Ag over 0.15m for gouge sampled in a north trending graphitic shear possibly related to Foster's Fault.

1:5,000 scale mapping, as well as rock and soil sampling, were conducted on the north side of Muse Ridge along the trend of the Ophir Break and along the trend of the Ultramafic Fault. The highest assay result for samples taken from Muse Ridge was 3.9 g/t Au, 6.4 g/t Ag from quartz vein float collected west of the Ophir Break. Weak soil anomalies (up to 59ppb Au) are associated with the Ophir Break. The highest assay received for chip samples taken across this structure was 0.75 g/t Au, 1.2 g/t Ag over 0.3m in mafic tuff. The highest assay received for chip samples taken across the Ultramafic Fault was 1.80 g/t Au, 2.00 g/t Ag over 0.7m.

On the eastern end of Muse Ridge an area of intense ankeritic alteration is coincident with the southern extension of the Ultramafic Fault. The highest assays for samples collected in this area were 0.58 g/t Au, 1.8 g/t Ag in hematitic mafic lapilli tuff, and 0.55 g/t Au, 1.6 g/t Ag in carbonatized mafic volcanic rock.

1:5,000 scale reconnaissance traverses were conducted on Fleece Creek, Highway Creek, and Limestone Creek, as well as along the new Open Pit Haul Road.

Diamond drilling on the Bear, Internal Sliver, Footwall and West Wall Faults from three areas: (1) Bear South; (2) Bear North underground; and (3) Troy Ridge totalled 5,015.76m (22 holes). Surface drilling in the Bear South area (2,283.25m, 8 holes completed, 1 abandoned) continued the program initiated in 1990 which was designed to track the southern end of the Bear Fault and identify any possible new reserve in this area. The Bear Fault was intersected in each of the eight drill holes. Drill information has traced the Bear Fault at least 540 meters south of the 1360m portal and indicates that the structure is continuous at least as far as the 892m elevation.

Two new carbonate bodies were identified during the Bear South drill program. A carbonate lens was intersected within the Bear Fault at 1150m elevation (below the carbonate lens in the Bear Main Zone). Anomalous gold grades are associated with the top of this lens which extends down dip to at least the 895m elevation. A second, discontinuous carbonate body was intersected on the footwall side of Foster's Fault. No anomalous gold grades were returned for this carbonate lens. Bear South drill results included:

Drill Hole	g/t Au	g/t Ag	/m(tt)	Structure
B91DH145	4.53	35.88	2.75	Bear Fault
B91DH146	0.99	6.98	3.43	Bear Fault
B91DH147	7.37	5.20	0.77	In footwall to Footwall Fault
B91DH148	5.62	1.00	1.61	In hanging wall to Bear Fault
B91DH149	3.06	5.69	3.69	In main carbonate lens
B91DH150	0.51	2.60	0.99	Footwall Fault
B91DH151	0.48	2.00	0.08	Footwall Fault
B91DH152	0.14	2.00	0.14	Footwall Fault

Bear North underground drill holes (607.91m, 7 holes) were planned to intersect the Bear Fault, Internal Sliver Fault and Footwall Fault at structurally favourable locations. A 50m long cross-cut was developed at 24250N on the 1400m level to provide a drill station for the underground drilling.

All drill holes intersected the desired targets. Results from the underground drilling program did not provide any significant additions to the Mineral Inventory, however, potential for additional resources in this area still exists.

Bear North underground drill results included:

Drill Hole	g/t Au	g/t Ag	/m(tt)	Structure
B91UG097	6.03	1.89	2.77	Internal Sliver Hanging Wall
B91UG098	5.63	11.38	10.67	Footwall Fault + HW carbonate
B91UG099	7.03	1.96	5.05	Internal Sliver Fault
B91UG099	10.29	9.00	0.07	Footwall Fault
B91UG100	1.39	5.90	1.94	Footwall Fault

Drill Hole	g/t Au	g/t Ag	/m(tt)	Structure
B91UG101	7.57	4.11	4.46	Bear Fault + ISHW
B91UG101	7.00	4.59	1.25	ISFW + Footwall Fault
B91UG102	3.54	5.13	0.64	Footwall Fault
B91UG103	6.56	6.03	4.51	Bear Fault

Troy Ridge drilling (2,124.60m, 6 holes) successfully extended the known strike length of the Bear Fault, the Internal Sliver Fault, the Footwall Fault and the West Wall Fault structures 380m north, but core assay results indicated that these structures carry lower gold values than those associated with these same structures in the Bear Main Zone. Troy Ridge drill results included:

Drill Hole	g/t Au	g/t Ag	/m(tt)	Structure
B91DH153	0.12	0.80	0.54	West Wall Fault
B91DH154	5.61	6.13	0.73	Internal Sliver Fault
B91DH155	1.15	2.20	1.23	Foster's Fault
B91DH156	2.98	2.00	0.26	Foster's Fault
B91DH157	4.42	3.00	0.30	In main carbonate lens
B91DH158	0.07	2.00	0.65	West Wall Fault

Re-logging of 31 drill holes in the Fleece Bowl area (25400N to 26000N) was completed at the end of the field season. A new geological interpretation through the Fleece A and Fleece B zones has been proposed. Mineralization occurring in the footwall of the Fleece Fault is considered to be related to Fleece Fault rather than to the footwall felsic dyke as was previously proposed. The potential zone of mineralization was previously considered to be highly controlled by the felsic dyke/Fleece Fault intersection, in which case, the mineralized zone had limited dip extent and tonnage potential. In the new model, the mineralized zone forms a steeply dipping tabular body in the silicified dolomite footwall rocks with a 500m strike potential, a 100-150m dip potential and up to a 20m width.

The need to identify additional minable reserves and to locate a significant new ore body requires a large, several year commitment to exploration at three levels. The 1992 exploration proposal calls for expenditure of $2.4 million to complete all work currently seen as capable of producing significant new minable reserves on the property. Generative work consists of compilation and regional work along the southern extensions of the Ophir Break and the Ultramafic Fault on Muse Ridge and on the TANGENT claims. Generative work is also proposed for the Highway Creek and Sam Creek areas, and for the STAN and OLLY claims. Detailed, grid-scale target definition work focuses on the Fleece Bowl and Totem areas. Drill targets are Bear South area (including a deep target and a southern extension target), Bear North underground, Fleece Bowl area and Bear Main (deep target) area. The proposed budget of $2.4M focuses on the higher priority targets, particularly on drill targets, while fulfilling the need for a multilevel exploration program.

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1. SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

1.1 SUMMARY

This report provides details of the 1991 exploration program and recommendations for 1992 exploration work on the Golden Bear Mine property. Total expenditure on the 1991 Golden Bear exploration program was $1.2M (Appendix A) as of December 31, 1991.

Exploration fieldwork on the Golden Bear Mine property between May 8th and September 16th, 1991 focused on the Bear Fault and other parallel north striking structures. The exploration program included pre-field season data compilation and longitudinal section construction. On-site work included re-logging drill core, claim staking in two areas, diamond drilling in three areas (Figs. 1.1.1 and 1.1.2), Troy Ridge grid establishment, 1:1000 scale grid mapping, 1:5000 scale mapping, rock chip and channel sampling, and contour soil sampling.

The main objectives of the 1991 exploration program were:

1) to outline areas proximal to present mine workings which have potential for a tonnage of ore at least sufficient to sustain an additional year of operation;

2) to maintain efforts on a larger scope toward identifying or drilling targets with potential to at least equal reserves which exist in the Bear Main Zone.

Pre-season work focused on data compilation on mapsheets 1, 2, 3, 6, and 19. Construction of longitudinal sections through Bear South, Bear North and Troy Ridge areas, as well as completion of re-logging all drill core south of 25200N was completed prior to drilling.

A total of 5,015.76 meters of drilling was completed in 22 drill holes in 1991. Eight holes (322.38m of ODEX and 1,960.87m of diamond drilling) were drilled from surface in the Bear South area, seven holes (607.91m) were drilled from underground in the Bear North area, and six holes (2,124.60m) were drilled from surface in the Troy Ridge area (Figs. 1.1.1 and 1.1.2). One hole was abandoned in the Bear South area. A total of 2,357 core samples, 28 percussion chip samples, 637 rock and 1,311 soil samples were collected and analyzed during the 1991 exploration field season.

Surface drilling in the Bear South area continued the program initiated in 1990 which was designed to track the southern end of the Bear Fault and identify any possible new reserve in this area. The Bear Fault was intersected in each of the eight drill holes

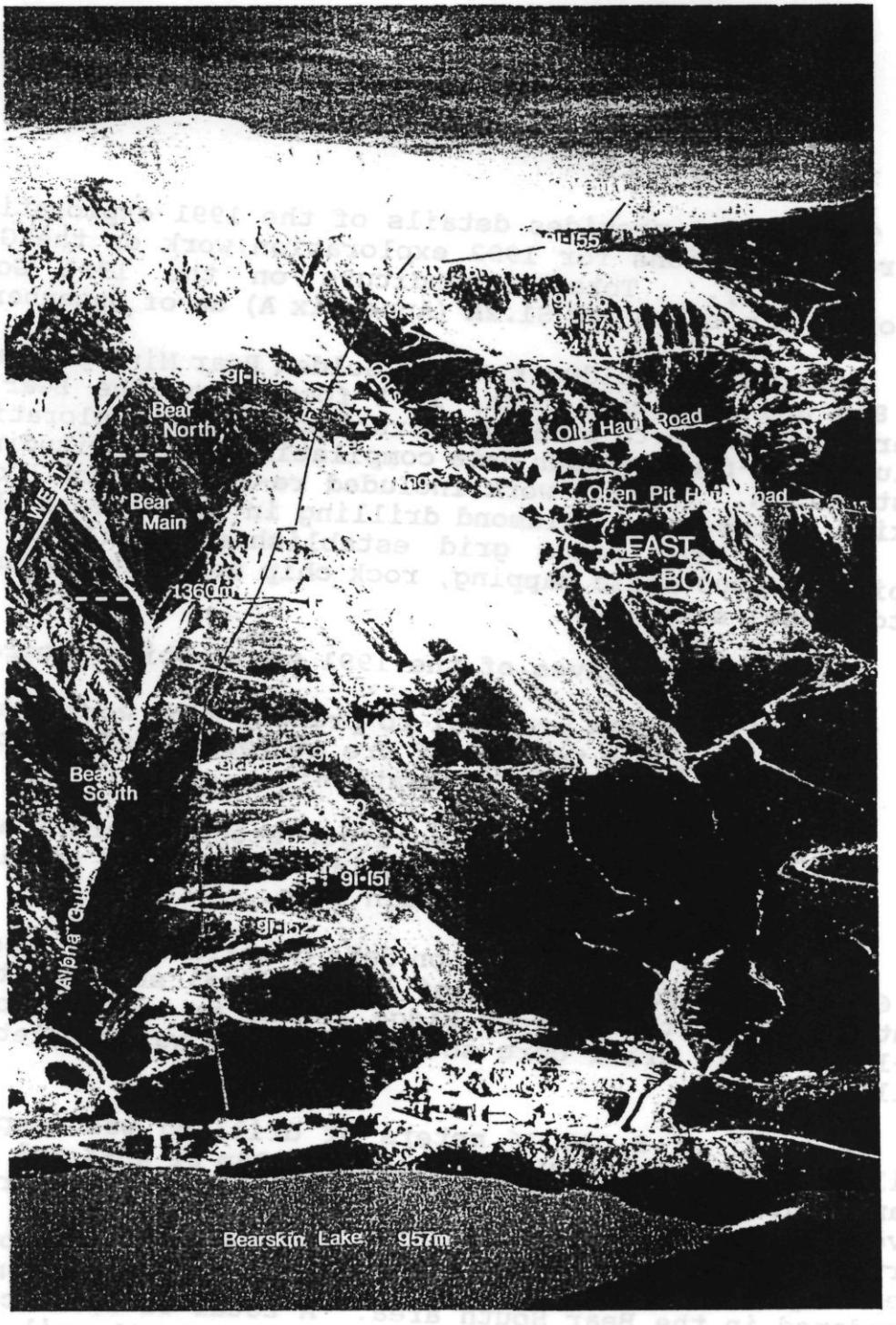


Figure 1.1.1 Golden Bear summary photograph showing areas of 1991 surface drilling and other exploration work. (Only 1991 drill holes are shown).

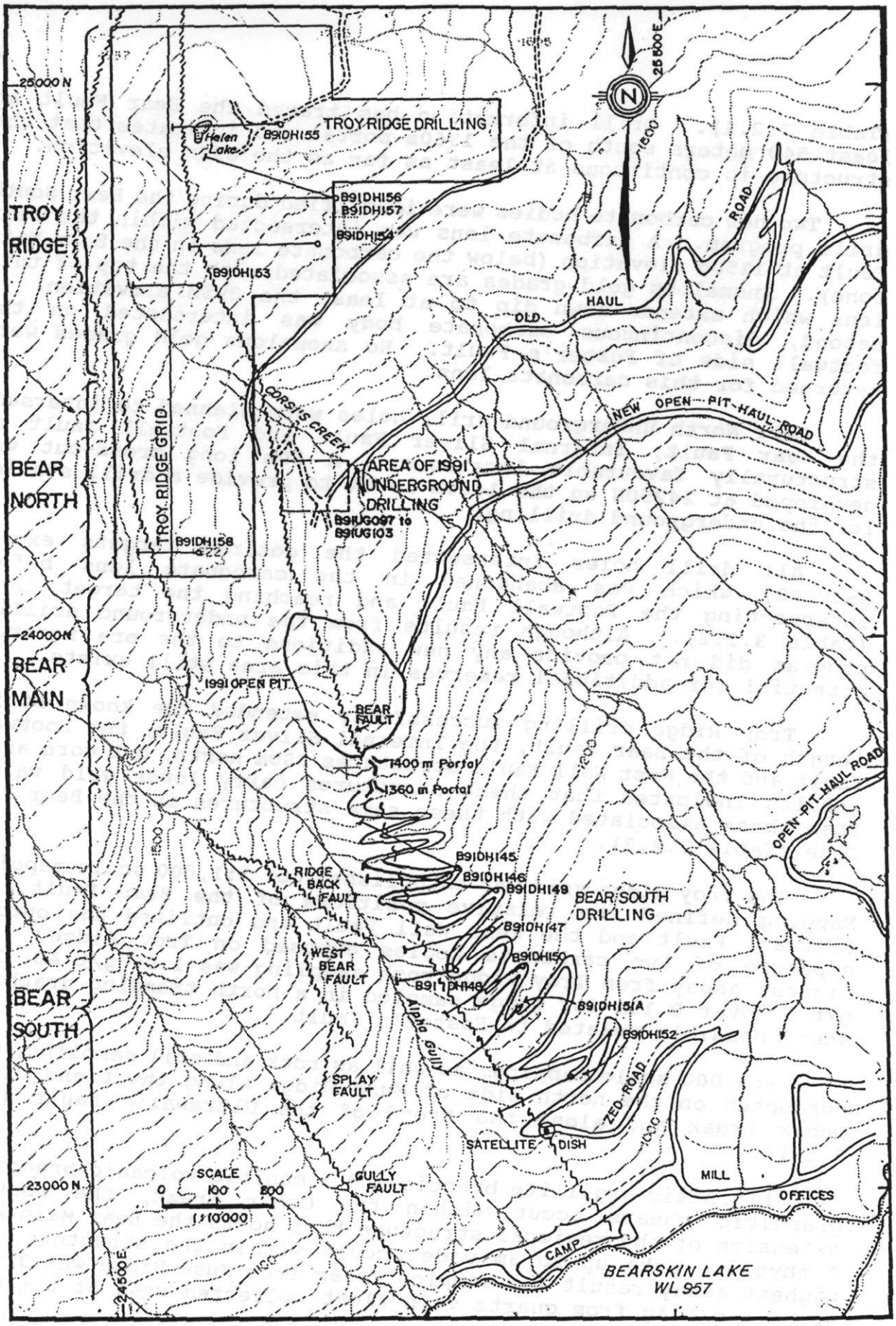


Figure 1.1.2 Areas of focus for 1991 exploration and other significant features for 1991 and 1992 exploration.

(Table 3.2.1). Drill information has traced the Bear Fault at least 540 meters south of the 1360m portal and indicates that the structure is continuous at least as far as the 892m elevation.

Two new carbonate bodies were identified during the Bear South drill program. A carbonate lens was intersected within the Bear Fault at 1150m elevation (below the carbonate lens in the Bear Main Zone). Anomalous gold grades are associated with the top of this lens which extends down dip to at least the 895m elevation. A second, discontinuous carbonate body was intersected on the footwall side of Foster's Fault. No anomalous gold grades were returned for this carbonate lens.

Bear North underground drill holes were planned to intersect the Bear Fault, Internal Sliver Fault and Footwall Fault at structurally favourable locations. A 50m long cross-cut was developed at 24250N on the 1400m level to provide a drill station for the underground drilling.

All drill holes intersected the desired targets except B91UG097 which was abandoned in the carbonate lens before intersecting the Footwall Fault and reaching the target depth (Table 3.2.2). Although results from the underground drilling program did not provide any new additions to the ore reserve, potential for additional reserves in this area still exists.

Troy Ridge drilling successfully extended the known strike length of the Bear Fault, the Internal Sliver Fault, the Footwall Fault and the West Wall Fault structures 380m north, but core assay results indicated that these structures carry lower gold values than those associated with these same structures in the Bear Main Zone (Table 3.2.3).

The Troy Ridge grid was established for 1:1,000 scale mapping. Mapping defined the relative positions of the Bear Fault, the Footwall Fault and the West Wall Fault and outlined the outcrop exposure of two carbonate bodies exposed on Troy Ridge. The highest assay from Troy Ridge rock sampling was 1.06 g/t Au, 1.20 g/t Ag over 0.15m for gouge sampled in a north trending graphitic shear possibly related to Foster's Fault.

1:5,000 scale mapping, as well as rock and soil sampling, were conducted on the north side of Muse Ridge along the trend of the Ophir Break and along the trend of the Ultramafic Fault (Fig. 3.1.1).

Limonitic argillite breccia and limonitic volcanic breccia in graphitic shears occur within the Ophir Break, the southern extension of the regional structure that hosts the Bear Main Zone. A rhyolite dyke up to 3m wide occurs within the structure. The highest assay result for samples taken from Muse Ridge was 3.9 g/t Au, 6.4 g/t Ag from quartz vein float collected west of the Ophir

Break. Weak soil anomalies (up to 59ppb Au) are associated with the Ophir Break. The highest assay received for chip samples taken across the structure was 0.75 g/t Au, 1.6 g/t Ag over 0.3m in mafic tuff.

On the eastern end of Muse Ridge an area of intense ankeritic alteration is coincident with the southern extension of the Ultramafic Fault. The highest assays for samples collected in this area were 0.58 g/t Au, 1.8 g/t Ag in hematitic mafic lapilli tuff, and 0.55 g/t Au, 1.6 g/t Ag in carbonatized mafic volcanic rock. The highest assay received for samples taken on the Ultramafic Fault was 1.8 g/t Au, 2.0 g/t Ag over 0.70m.

1:5,000 scale reconnaissance traverses were conducted on Fleece Creek, Highway Creek, and Limestone Creek, as well as along the new Open Pit Haul Road (3.1.1).

Contour soil sampling, mapping and rock sampling were conducted in Fleece Creek across the trend of the Ultramafic Fault. Weak soil anomalies (up to 65ppb Au) occur coincident with the trend of this structure. The highest assays received for rock samples taken in Fleece Creek were 1.37 g/t Au, 0.6 g/t Ag over 0.10m and 0.72 g/t Au, 0.4 g/t Ag over 0.10m both in quartz vein material.

The carbonate rock in fault contact with mafic volcanic rock in the Highway Creek area is a favourable setting for development of Golden Bear-style mineralization. Soil samples taken across the volcanic-carbonate contact indicate weak Au anomalies at the fault contacts (up to 73 ppb Au) and within the carbonate body (up to 84 ppb Au).

The carbonate-volcanic contact exposed in Limestone Creek corresponds to the southern extension of the West Wall Fault. The highest assay result for the 20 samples taken across this contact is 0.14 g/t Au, 1.4 g/t Ag.

Mapping along the new Open Pit Haul Road supported the previous mapping carried out on the old Haul Road in 1990. A gossanous zone of carbonatized mafic volcanic rock was mapped adjacent to a northwest trending, steeply northeast dipping shear in Corsi's Creek. The highest assay values reported for the 38 samples collected are 0.31 g/t Au, 1.40 g/t Ag over 0.35m and 0.21 g/t Au, 1.6 g/t Ag over 0.30m.

The TANGENT claims were staked on the southeast corner of the Golden Bear Property (Fig. 2.1.2) to cover possible southward extensions of the Ultramafic Fault and Ophir Break structures. Several samples were collected along claim lines during staking. The highest assay result is 0.62 g/t Au, 13.6g/t Ag, 9700ppm Cu for a quartz vein bearing copper mineralization.

The EL fraction claim was staked on the eastern edge of the Golden Bear claim block (Fig. 2.1.2) to cover a claim gap existing between the EL 2, EL 3 and HORN 1 claims (of the Golden Bear Property) and the EPI 3 claim.

Re-logging of 31 drill holes in the Fleece Bowl area (25400N to 26000N) was completed at the end of the field season. Cross sections and a longitudinal section through this area were constructed from the new re-logging information and from the existing data.

A new geological interpretation through the Fleece A and Fleece B zones has been proposed. Mineralization occurring in the footwall of the Fleece Fault is considered to be related to the Fleece Fault rather than to the footwall felsic dyke as was previously proposed. The potential zone of mineralization was previously considered to be highly controlled by the felsic dyke/Fleece Fault intersection, in which case, the mineralized zone had limited dip extent and tonnage potential. In the new model, the mineralized zone forms a steeply dipping tabular body in the silicified dolomite footwall rocks with a 500m strike potential, a 100-150m dip potential, and a 20m width.

A concentrated effort over several years is required to assess new target areas on the Golden Bear Mine property and to extend the life of the Golden Bear Mine. Exploration potential of the property, both on the ore bearing structure and in the surrounding area, is considered to be very good and the chances for success are high.

The need to identify additional minable reserves and to locate a significant new ore body requires a large, several year commitment to exploration at three levels. The 1991 exploration proposal calls for expenditure of $2.4 million to complete all work currently seen as capable of producing significant new mineable reserves on the property. Generative work consists of compilation and regional work along the southern extensions of the Ophir Break and the Ultramafic Fault on Muse Ridge and on the TANGENT claims. Generative work is also proposed for the Highway Creek and Sam Creek areas, and for the STAN and OLLY claims. Detailed, grid scale target definition work focuses on the Fleece Bowl and Totem areas. Drill targets are the Bear South area, the Bear North underground, the Fleece Bowl area and the Bear Main (deep target) area. The proposed budget of $2.4M focuses on the higher priority targets, particularly on drill targets, and fulfils the need for a multilevel exploration program.

1.2 CONCLUSIONS

The 1990 field season was successful in:

1) continuing the search for a new large reserve; and

2) generating drill targets and areas worthy of further investigation in 1992.

The first objective was achieved through drilling the Ophir Break structures along strike to the south and north of the Bear Main Zone. The second objective was achieved through interpretation of the work completed and the results received from the 1991 exploration program.

Drilling the southern extension of the Bear Fault in the Bear South area has indicated that this structure persists 540m south of the 1360m portal and that the structure is continuous at least as far as 892m elevation. Two new carbonate lenses were delineated. The Bear South area provides two targets that require further testing: the Bear South Deep target; and the Bear South southern extension target.

Underground drilling results in the Bear North area did not provide any new additions to the ore reserve. Potential for defining additional reserves still exists on the Bear Fault, Internal Sliver Fault and the Footwall Fault in the Bear North area. Exploration drilling is required to further test these structures.

Troy Ridge drilling successfully extended the known strike length of the ore bearing structures 380m north. The Bear, Internal Sliver and Footwall Faults carry anomalous Au grade, but not ore grade in the Troy Ridge area.

Two other target areas are considered to be capable of hosting a significant new reserve and therefore require exploration drilling.

The new geologic interpretation of the mineralization in the Fleece Bowl area indicates that the mineralized zone forms a steeply dipping tabular body with significant strike and down dip potential. Exploration drilling is required to test the new interpretation and further test the potential of the Fleece Bowl area.

The area below the Bear Main zone is also considered a drill target. The potential for mineralization in this area is two-fold. A conduit or feeder for the mineralizing fluids that generated the Bear Orebody could exist in this area and/or a hanging wall cymoid orebody could exist on a lower carbonate lens within the Bear Fault structure below the Bear Main Zone.

Areas with potential to become targets for exploration drilling, and therefore warranting detailed investigation, are: Fleece Bowl, Totem, Muse Ridge, east Muse Ridge, TANGENT claims, Highway Creek, STAN and OLLY claims, and Sam Creek (Fig. 3.1.1). Each of these areas contains or is on strike with a large scale potentially mineralized structure and/or contains a carbonate-mafic volcanic contact which is a favourable setting for Golden Bear-style mineralization.

1.3 RECOMMENDATIONS FOR 1992

The Golden Bear Mine property encloses 126.97 square kilometers in a highly prospective geological setting for gold mineralization. The Tulsequah map sheet has recently become a center for increasingly active exploration as more companies move northwards from the Telegraph Creek map sheet.

The Golden Bear mine property itself contains several prospects and target areas aligned on north striking regional scale faults and associated with intense hydrothermal alteration. Some of these targets have undergone only preliminary investigation.

The previous focus of exploration in and around the Bear Main ore body was aimed at proving a minable ore reserve. This has meant that efforts to develop significant targets any distance from this zone, even those readily accessible from current facilities, have been postponed. Several targets close to the existing orebody and mine infrastructure require immediate assessment and/or follow-up work to bring them to the drill target stage and beyond within the projected life span of current operations.

Detailed work is required immediately adjacent to the Bear Main Zone and within the Ophir Break to further test the remainder of the originally estimated 1.6 million tonne mineral inventory. Areas included in this original inventory have the potential to become minable reserves in the short term. Some of these areas can be accessed from existing mine workings.

The mine has a projected life of 3 years from the time of this report, thus there is an urgency to the exploration effort at Golden Bear Mine. Not only is a significant new reserve required to sustain economic operation, but this reserve must be found in the near future to allow sufficient lead time to both delineate and then develop the reserve. The open pit mining season and the impending loss of access to the underground workings imposes further constraints on the timing of underground exploration.

A concentrated effort over several years is required to assess new target areas on the property and extend the life of the Golden Bear Mine. Exploration potential of the property, both on the ore bearing structure and in the surrounding area, is considered to be very good and the chances for success are high.

The 1992 exploration program is outlined in the following sections. Tables outlining the maximum manpower requirements (Table 1.3.1), a summary of the drilling footages, costs and accommodation requirements (Table 1.3.2), and an itemized budget estimate (Table 1.3.3) follow the descriptions of the proposed work program. A work schedule for the 1992 exploration program is also included (Table 1.3.4).

1.3.1 OBJECTIVES

The 1992 exploration program proposal has a two-fold objective of: (1) exploring the property-scale potential; and (2) continuing with detailed work in the Bear South, Bear North, Troy Ridge, Fleece Bowl and Totem areas.

The primary goals of the 1992 exploration program are:

1) to outline areas proximal to the present mine workings which have potential for a tonnage of ore at least sufficient to sustain an additional year of operation;

2) to maintain efforts on a larger scope of identifying or drilling targets with potential to at least equal reserves which exist in the Bear Main Zone.

The proposed 1992 program includes surface and underground diamond drilling, mapping, prospecting, contour soil and stream sediment sampling. The surface exploration work is viewed as part of a several year effort to assess the potential of the Golden Bear Mine property and to identify new targets for drill testing in 1993. The underground program, which has time constraints based on the start of open pit mining in 1992 and loss of access during the 1992 mining season, is intended to identify sufficient reserves to extend the immediate mine life by a period of at least one year.

The 1992 program has been divided into a two part schedule of work so that underground drilling can be addressed prior to commencement of 1992 open pit mining and the surface drilling and exploration work can be conducted when there is the least amount of snow cover.

The targets identified for work in 1992 are divided into three categories based on their level of definition:

1) Generative Work - includes property scale prospecting, mapping, and sampling of highly prospective areas based on anomalous geochemical results or favourable structural or other geologic evidence. This work will lead to definition of localized targets for detailed follow-up work.

2) Target Definition - includes detailed mapping, chip sampling, grid soil sampling, ground-based geophysics, and trenching of localized alteration, geochemical or geophysical anomalies or local areas of favourable geology. This work leads to development of drill targets.

3) Drill Targets - include areas with clearly identified potential based on previous detailed target assessment.

Each of the above categories is comprised of a prioritized list of viable targets which require work as outlined below.

Further compilation work in 1991 and early 1992 may cause the objectives or target areas outlined in the following sections to change significantly before the 1992 program is implemented.

1.3.2. REGIONAL EXPLORATION (Generative Work)

1) Compilation/Field Preparation

Compilation of data from property scale mapping, sampling and prospecting prior to the start of the summer field season. This will allow maximum use of existing data and may identify significant targets for examination.

Compilation/Field Preparation	2 people, 2 months

2) Muse Ridge (South Side)

Reconnaissance traverses on the south flank of Muse Ridge have identified: (1) a gossanous shear zone in Tan Creek that follows the southern strike extension of the Ophir Break; and (2) a large (up to 3 meter thick) rhyolite dyke that strikes parallel to the shear zone but is approximately 50 meters on the footwall side of the zone. The shear zone is a continuation of the well developed fault on the north side of the ridge that was mapped and sampled during 1991. The structure is persistent and may host mineralization along the southern strike extension of the Ophir Break. The rhyolite dyke may have similarities to the Fleece Bowl mineralized felsic dyke.

1:5,000 scale mapping	1 person, 3 weeks
Channel/chip sampling	2 people, 2 weeks
Contour soil sampling	2 people, 1 week

Helicopter support is required.

3) East Muse Ridge (South Side)

A large gossanous area on the south side of east Muse Ridge coincides with the southern strike extension of the Ultramafic Fault. The area consists of folded carbonates and limonitic mafic volcanic rocks. Due to the rugged nature of this hillside there is only sparse data from previous exploration efforts.

Reconnaissance/prospecting	1 person, 1/2 week
Contour soil sampling	1 person, 1 week

Helicopter support is required.

4) Tangent Claims

The Tangent Claims were staked to cover the southern extent of the Ophir Break and Ultramafic Fault. Open ground existed on the southern edge of the Golden Bear Mine property on strike with these two major lineaments. Prospecting, stream sediment sampling and contour soil sampling are required to assess the potential of this area.

Reconnaissance/prospecting	1 person, 1/2 week
Contour soil/stream sampling	1 person, 1 week

Helicopter support is required.

5) Highway Creek

A large fault-bounded carbonate body is exposed along the length of Highway Creek. Carbonate rock in fault contact with mafic volcanic rock is a favourable setting for development of Golden Bear-style mineralization. The proximity of a large granodiorite body also suggests the potential for development of a skarn at or near the carbonate unit.

The fault that hosts the carbonate lens is the southern strike extension of the Ultramafic Fault. The carbonate body terminates abruptly at Fleece Creek and a fault zone within mafic volcanics persists south of the Fleece Creek/Bearskin Creek Valley. Data compilation has shown Au, Ag, Sb and As soil anomalies exist on almost every traverse run across the fault contacts of this carbonate unit with mafic volcanic rock.

1:5,000 scale mapping, reconnaissance	1 person, 1 week

Helicopter support required.

6) Stan and Olly

A large north-trending anticline with a core of carbonate rock overlain by mafic volcanic rock is exposed on the Stan and Olly claims on the eastern edge of the property. The potential for a favourable lithologic setting for mineralization, carbonate in fault contact with mafic volcanic rock, warrants assessment.

Reconnaissance/Prospecting	1 person, 1 week
Contour soil sampling	1 person, 1 week

Helicopter support required.

7) Sam Creek

Follow-up of anomalous geochemical results for precious metals and base metals is necessary to determine the potential of the Ophir Break in this area.

Reconnaissance/Prospecting	1 person, 1 week
Contour soil sampling	1 person, 1 week
Helicopter support required.	

8) Compilation Investigation

Follow-up of compilation results yet to be defined.

Reconnaissance/Prospecting	1 person, 1 week
Contour soil sampling	1 person, 1 week
Helicopter support required.	

1.3.3 GRID SCALE EXPLORATION (Target Definition)

1) Fleece Bowl

Fleece Bowl area requires detailed structural mapping at 1:1,000 scale. Detailed channel sampling may be warranted to provide further lithogeochemical information.

Gridding	2 people, 2 weeks
1:1,000 scale mapping	1 person, 3 weeks

2) Totem

Detailed 1:1,000 scale structural mapping and channel sampling is required on portions of the Totem Zone. The geophysical data provides a definitive trace of the most significant structures. Further definition of the structural and lithologic setting of the Totem Zone may be achieved by detailed structural mapping. Establishing a structural model will provide a guide to potential mineralization. The size of the Totem silicified zone is extensive, thus the size of a potential mineralized system is very encouraging.

Gridding	2 people, 2 weeks
1:1,000 scale mapping	1 person, 4 weeks
Re-logging core, section building, interpretation	2 people, 3 weeks

1.3.4 DIAMOND DRILL TARGETS

1) Bear South (Deep Target)

Drilling in 1991 indicated that a second locally mineralized carbonate lens exists to the south of and below the main carbonate lens associated with the Bear Orebody. A 1991 drill intersection on the Bear Fault at 1075 meters elevation has a composite grade of

8.30 g/t Au, 88.40 g/t Ag/0.39mtt and supports the potential for development of a mineralized system below the Bear Main Zone. If this new carbonate lens extends north, directly below the Bear Orebody, the mineralizing fluids may have generated another ore zone in the hanging wall cymoid position of this second lens.

6 holes approx. 1,100 ft each = 6,600 feet

Strategy: Test the lower carbonate lens below the southern end of the Bear Main Zone. Drill spacing of 80 to 100 meters provides wide spaced exploratory drilling of the target area between 1170 and 1040 meters elevation. Drilling must be from surface due to the large step-back needed to intersect the structure at the desired depths.

2) Fleece Bowl ("B" zone and Felsic Dyke)

Most potential in the Fleece B zone appears to be in silicified dolomite rocks that occur in the footwall of the Fleece Fault and carry anomalous Au grades. Highly anomalous grade occurs in the area where a Felsic Dyke cross-cuts the silicified dolomite rocks. The mineralized zone forms a steeply dipping tabular body in the silicified dolomite footwall rocks with a 500m strike potential, a 100-150m dip potential, and a 20m width.

6 holes approx. 800 ft each = 4,800 feet

Strategy: Test strike and dip extensions of Fleece B zone with wide spaced drill holes at 35 to 55 meter spacing.

3) Fleece Bowl ("A" zone)

Fleece A zone is an elongate block of reserves that is mostly below 1770 meters elevation. An initial test of the southern end of the Fleece A zone is required to possibly extend the area of known reserves. The nearest drill hole, that is at a similar elevation as the outlined reserve, is 200 meters to the south.

4 holes approx. 800 ft each = 3,200 feet

Strategy: Test southern strike extent of the Fleece A zone in an area with no previous drilling and at appropriate depths. Wide spacing drilling of 60 to 70 meters is warranted to give an initial test of this area.

4) Bear North Underground

The Bear North area contains several wide-spaced drill intersections on at least 3 significant parallel structures. Each

of these structures requires further definition to outline ore blocks and establish dip extent. The northern 100 meters of the 1400 meter level has received no underground drilling to date. This area has an exploration drift along its entire length and can be drill tested with little further underground development.

19 holes approx. 350 ft each = 6,650 feet
1 - 40 meter diamond drill cross-cut = 40 meters
Rehabilitation of the 1400 m level drift to 24550N.

Strategy: Test the Bear North area along strike from the Bear Main Zone on the Bear Fault, Internal Sliver Hanging Wall Fault, Internal Sliver Footwall Fault, and Footwall Fault. The drill holes and budgeted footage allow the Bear North area to be tested in a minimum fashion to the end of current development at 24535N using 40 to 50 meter spacing between holes.

5) Bear Center (Deep Target)

Two possible targets exist below the Bear Main Zone: (1) a conduit or feeder for the mineralizing fluids that generated the Bear Orebody; and (2) a hanging wall cymoid orebody on a possible lower carbonate lens. Previous deep drilling was very widely spaced and has produced some anomalous assays but no path or conduit has been identified.

5 holes approx. 800 ft each = 4,000 feet
1 - 75 meter diamond drill cross-cut = 75 meters

Strategy: Test the down-dip potential of the Bear Main Zone for a mineralized feeder or conduit. Hole spacing should be 60 to 80 meters between holes to provide an adequate test of this area.

6) Bear South (Completion of southern extension drilling)

The 1991 Bear South drill program was successful in delineating a new locally mineralized carbonate lens and extending the known strike extent of the Bear Fault by 465 meters to 23100N. The potential for mineralization along the remaining 325 meters between the southernmost 1991 drill intercept and Bearskin Lake still exists. Alteration of the mafic volcanic rocks and persistence of this south lens support the need to test this target.

5 holes approx. 800 ft each = 4,000 feet

Strategy: Continue to test the Ophir Break south of the Bear Main Zone using the structural information from the 1991 drilling. Geophysical responses may also help track the surface trace of the structure in this area. Hole spacing should be approximately 100 to 120 meters.

Table 1.3.1 **MAXIMUM MANPOWER REQUIREMENTS FOR THE 1992 GOLDEN BEAR EXPLORATION PROPOSAL.**

Title	Mandays Field Work Available (i.e. Mar-Sept)	Employment Period	Hiring Requirement (# people)
Project Geologist	N/A	Jan-Dec	1
Assist. Proj. Geol.	N/A	Jan-Dec	1
Geologist	496	Jan-Dec	1
		Jan-Nov	1
		June-Aug	1
		June-Sept	2
Geological Assist.	418	Mar-May,	1
		June-Sept	1
		June-Aug	2
Surveyor/Computer Operator	135	Mar-Aug	1
Total geology crew: 12			

Table 1.3.2 **SUMMARY FOR THE 1992 GOLDEN BEAR EXPLORATION PROPOSAL.**

Total Peak Geology Crew	12 people
Surface Diamond Drill Footage	18,600 ft
Underground Diamond Drill Footage	10,650 ft
Total Maximum Accommodation Requirement At Any Time	23 people
Total Budget for Surface Drilling	$970,000.00
Total Budget for Underground drilling	$383,000.00
Total Budget for 1992	$2,381,730.00

Table 1.3.3 **ITEMIZED EXPENDITURES FOR THE 1992 GOLDEN BEAR EXPLORATION PROPOSAL.**

Surface Diamond Drilling	$970,000.00	40.7%
Supervision and Wages	377,000.00	15.8%
U/G Diamond Drilling	383,000.00	16.1%
Air Support	110,880.00	4.7%
On-Site Assays	44,400.00	1.9%
Camp Accommodation*	75,350.00	3.2%
Roads and Trails	54,000.00	2.3%
U/G Development	145,000.00	6.1%
Travel	46,000.00	1.9%
Field Materials	20,000.00	0.8%
Off-Site Assays	34,000.00	1.4%
Vehicle/Equipment Expense	32,000.00	1.3%
Claim Costs	16,000.00	0.7%
Drafting	25,000.00	1.0%
Office Supplies	12,000.00	0.5%
Trenching	0.00	0.0%
Contractors	0.00	0.0%
Rentals and Leases	12,000.00	0.5%
Office Rental	19,800.00	0.8%
Communications (phone & fax)	4,800.00	0.2%
Fees	500.00	0.02%
TOTAL	2,381,730.00	100%

* This figure includes accommodation costs for housing all personnel in existing bunkhouse facilities at $25/day/person.

Table 1.3.4. **WORK SCHEDULE FOR THE 1992 EXPLORATION PROGRAM**

MONTH	#GEOLOGY PEOPLE	DRILL LOCATION		CONTRACTORS LOCATION	#PEOPLE IN CAMP
JANUARY	4	#1	#2		0
FEBRUARY	4			FEB 1 1400m LEVEL X-CUT & REHAB	4
MARCH	6	MAR 1 BEAR NORTH U/G		1360m LEVEL X-CUT APR 1	14
APRIL	7		APR 1 BEAR CENTER DEEP		5
MAY 1-15	7	MAY 15			15
16-31	7		MAY 5		0
JUNE 1-15	7	JUNE 15			0
16-30	13	BEAR SOUTH DEEP	JUNE 22		23
JULY	13	AUG 15	FLEECE B		23
AUGUST	13	AUG 15 BEAR SOUTH	AUG 7 AUG 7 FLEECE A		23
SEPTEMBER	9	SEPT 30	SEPT 7		19
OCTOBER	5				0
NOVEMBER	5				0
DECEMBER	4				0

2. INTRODUCTION

2.1 LOCATION AND ACCESS

The Golden Bear Mine property is located in northwestern British Columbia in the Atlin Mining Division at latitude 58° 13′ north and longitude 132° 17′ west (Tulsequah map sheet 104K). The mine is approximately 140 km west of Dease Lake and 160 km southeast of Atlin (Fig. 2.1.1).

The property covers 12863.85 hectares (31786.14 acres) of irregular, glaciated highlands separated by rugged, deeply incised valleys on the east side of the Chechidla Range in the Coast Mountains. Elevations range from 600 to 2200 m and most of the property is above tree line.

The claim block is south of Tatsamenie Lake and roughly centered on Bearskin Lake (Fig. 2.1.2). Bearskin Lake, locally known as "Muddy Lake", is within the northeast flowing Bearskin Creek drainage, a tributary of the Samotua River.

Access to the mine is by road, fixed wing aircraft or helicopter. The private, 155 km all-weather mine access road joins the Dease Lake - Telegraph Creek road. A 1494 m (4900 ft) gravel landing strip and the 1500 m (4920 ft) long lake accommodate fixed-wing aircraft. Float planes can operate on Bearskin Lake between early June and late October. Ski-equipped aircraft can be used on the lake between late November and early May. A heli-pad is situated just west of the camp.

2.2 CLAIM STATUS

The Golden Bear property consists of 31 claims (457 units covering 11,401.75 hectares) and one mining lease (covering 1462.1 hectares) held in the name of North American Metals (B.C.) Inc. (Fig. 2.1.2). The claim groups and their present expiry dates are listed in Table 2.2.1.

The TAN 7, BEAR 1N, BEAR, BEAR 3S, and TOTEM claims were converted to Mining Lease #40, effective October 30, 1989. The primary term of the lease is 30 years and subject to an annual rental fee.

The BEAR 4, TOTEM 2, BEAR 2, BEAR 3N, BEAR 1S, and SAM 1 claims were last grouped on February 15, 1990 as the "Bears" group.

The Mining Lease and the TAN 3, TAN 4, TAN 6, and THOR 4 claims were grouped on June 10, 1991 as the "TAN" group.

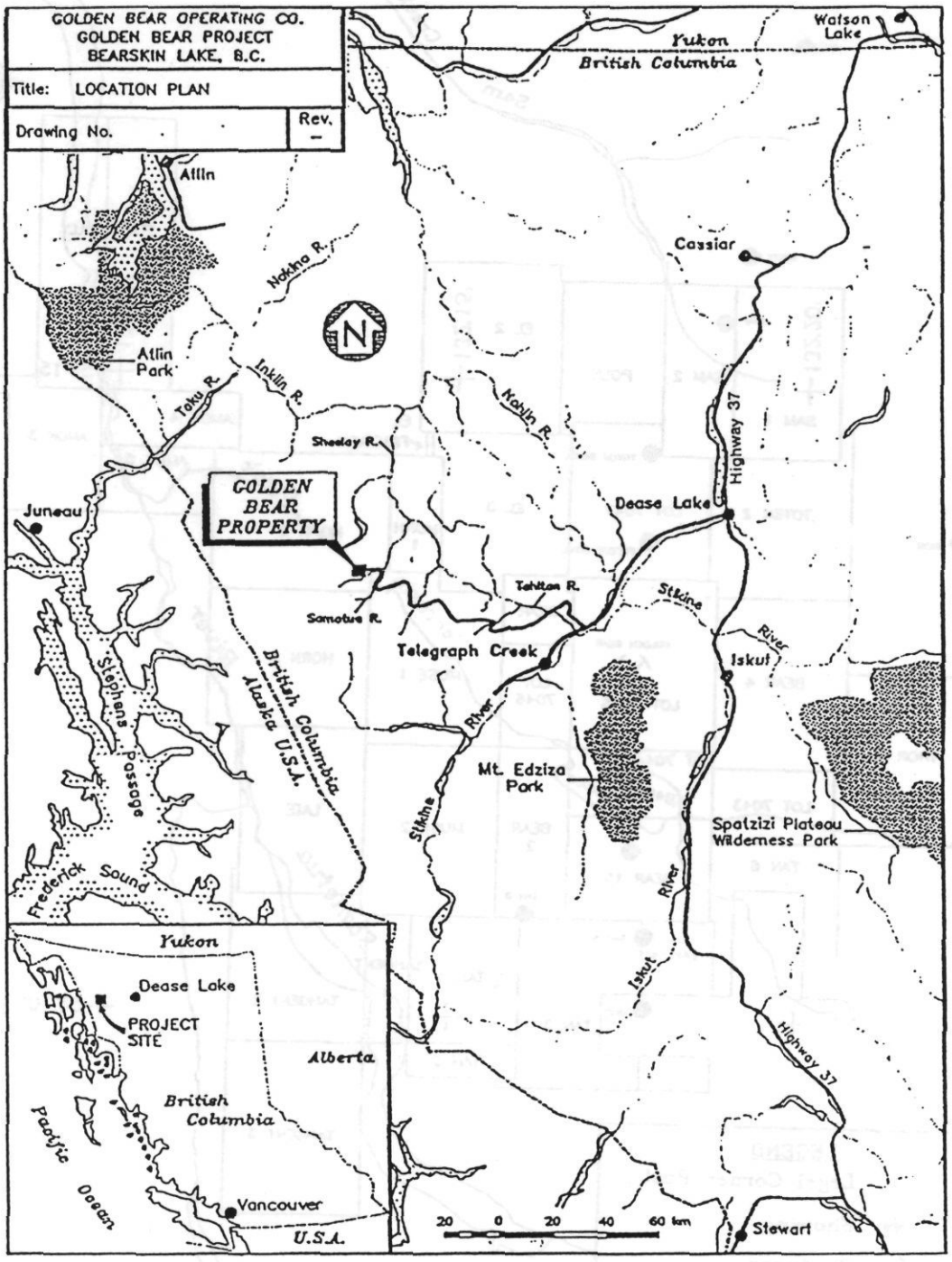


Figure 2.1.1 Location map of northwestern British Columbia showing the Golden Bear Mine property, the mine access road and proximity to Highway #37.

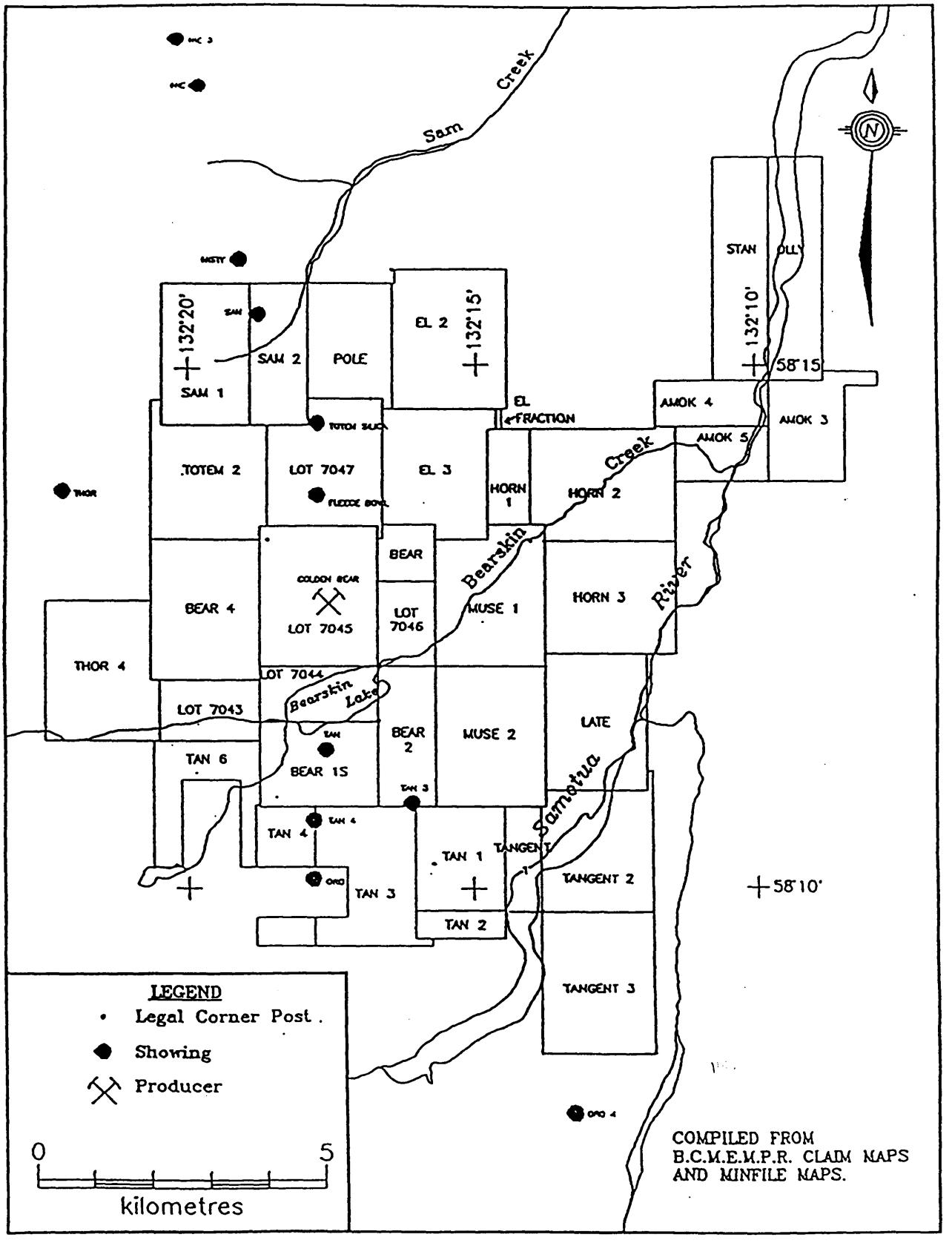


Figure 2.1.2 Claim location map for the Golden Bear property, showing Minfile mineral showings and prospects.

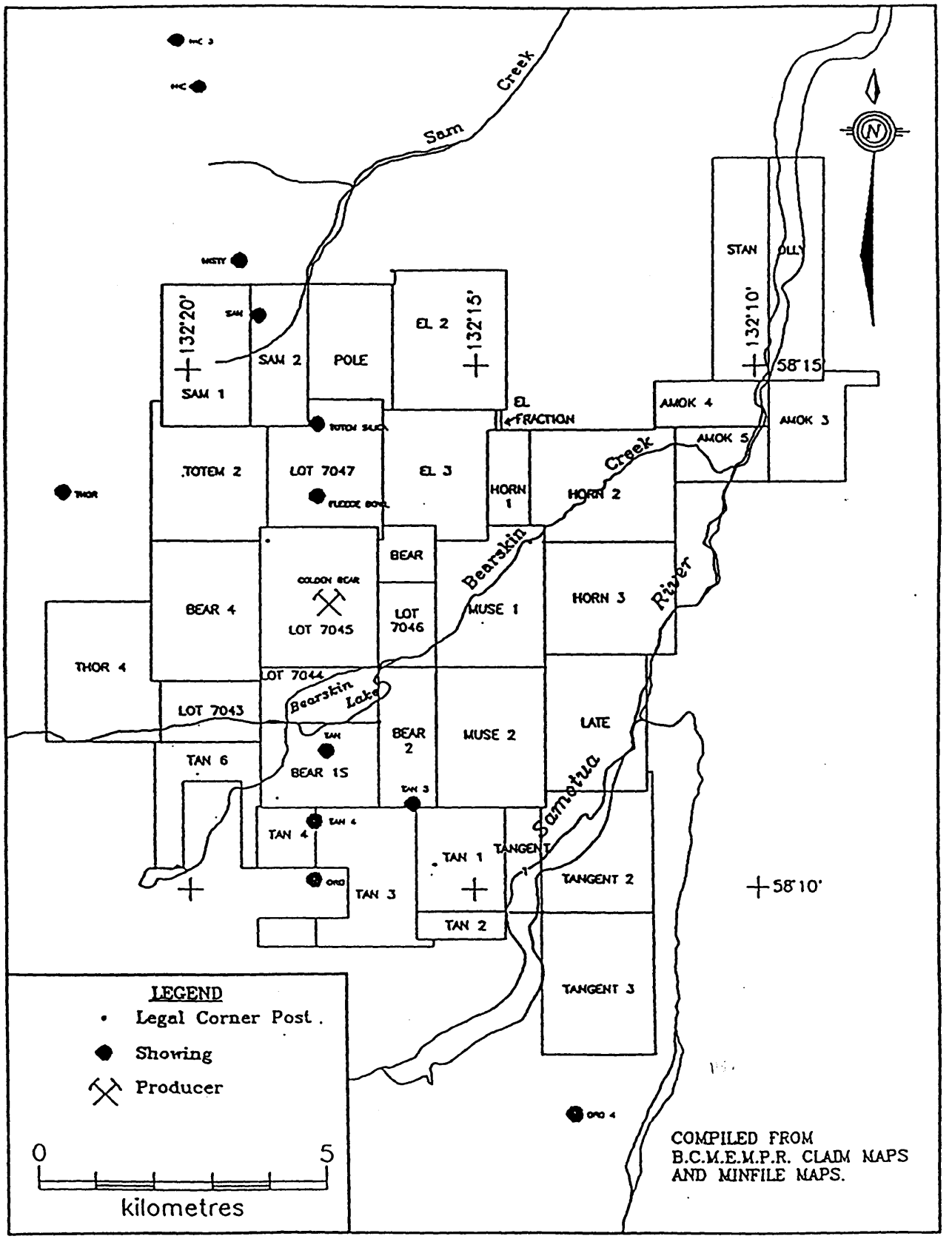


Figure 2.1.2 Claim location map for the Golden Bear property, showing Minfile mineral showings and prospects.

Table 2.2.1 **CLAIM GROUPS AND EXPIRY DATES FOR THE GOLDEN BEAR PROPERTY.**

Claim Name	Tenure Number	Record Date	Expiry Date	Ha	Units	Min. Div.	NTS
Mineral Lease 40	203776	10/30/89	10/30/19	1462.1		Atlin	104K/1W
(Tan 7*)						Atlin	104K/1W
(Bear 1N*)						Atlin	104K/1W
(Bear*)						Atlin	104K/1W
(Bear 3S*)						Atlin	104K/1W
(Totem*)						Atlin	104K/1W
Amok 3	202060	10/26/83	10/26/99	400	16	Atlin	104K/1E
Amok 4	202016	07/04/83	07/04/99	200	8	Atlin	104K/1E
Amok 5	202017	07/04/83	07/04/99	200	8	Atlin	104K/1E
Bear 1S	202644	11/04/88	11/04/95	300	12	Atlin	104K/1W
Bear 2	201910	08/31/81	08/31/94	250	10	Atlin	104K/1W
Bear 3N	202643	11/03/88	11/03/95	100	4	Atlin	104K/1W
Bear 4	201929	08/26/82	08/26/94	500	20	Atlin	104K/1W
El Frac.	303048	08/04/91	08/04/92	1.75	1	Atlin	104K/1E
El 2	201932	09/15/82	09/15/94	500	20	Atlin	104K/1W
El 3	201933	09/22/82	09/22/94	500	20	Atlin	104K/1W
Horn 1	202013	07/04/83	07/04/94	200	8	Atlin	104K/1W
Horn 2	202014	07/04/83	07/04/99	500	20	Atlin	104K/1E
Horn 3	202015	07/04/83	07/04/98	500	20	Atlin	104K/1E
Late	202018	07/04/83	07/04/98	500	20	Atlin	104K/1E
Muse 1	201988	06/13/83	06/13/98	500	20	Atlin	104K/1W
Muse 2	201989	06/13/83	06/13/98	500	20	Atlin	104K/1W
Olly	202020	07/04/83	07/04/99	400	16	Atlin	104K/1E
Pole	201885	08/21/81	08/21/94	500	20	Atlin	104K/1W
Sam#1	201844	03/05/81	03/05/00	375	15	Atlin	104K/1W
Sam#2	201845	03/05/81	03/05/94	250	10	Atlin	104K/1W
Stan	202021	07/04/83	07/04/99	400	16	Atlin	104K/1E
Tan 1	202008	07/04/83	07/04/98	300	12	Atlin	104K/1W
Tan 2	202009	07/04/83	07/04/98	75	3	Atlin	104K/1W
Tan 3	202010	07/04/83	07/04/01	500	20	Atlin	104K/1W
Tan 4	202011	07/04/83	07/04/01	250	10	Atlin	104K/1W
Tan 6	202012	07/04/83	07/04/01	500	20	Atlin	104K/1W
Tangent1	303046	08/07/91	08/07/92	200	8	Atlin	104K/1E
Tangent2	303047	08/07/91	08/07/92	500	20	Atlin	104K/1E
Tangent3	303208	08/08/91	08/08/92	500	20	Atlin	104K/1E
Thor 4	202019	07/04/83	07/04/01	500	20	Atlin	104K/1W
Totem 2	201930	08/26/82	08/26/94	500	20	Atlin	104K/1W
31 claims and one mining lease				12863.85 Ha	457 Units		

* These claims constitute mineral lease #40.

2.2.1 1991 CLAIM STAKING

Two areas with potential for mineralization on the margin of the Golden Bear claim block were on free or unclaimed ground and were staked in early August.

The TANGENT claims (TANGENT 1, 2, and 3) were staked on the southeast corner of the Golden Bear Property (Fig. 2.1.2). This area is adjacent to the LATE, MUSE 2, and TAN 1 claims (of the Golden Bear Property) and further enclosed by the CAN 3, RED 2, RED 3, RED 5, L 1, and ORO 4 claims. This area is on strike with the Ultramafic Fault and is southwest of a large alteration zone that straddles Muse Ridge.

The EL Fraction claim was staked on the eastern edge of the Golden Bear claim block (Fig. 2.1.2) to cover a claim gap existing between the EL 2, EL 3, and HORN 1 claims (of the Golden Bear property) and the EPI 3 claim. A granodiorite body has intruded mafic volcanics and carbonate in this area and poses a target for gold skarn mineralization. The Ultramafic Fault is at least 600 m west of this fraction. Potential exists for mineralization along the plutonic margin or near the Ultramafic Fault.

2.3 PROPERTY GEOLOGY

The Golden Bear property is underlain by complexly folded and faulted Permo-Triassic rocks of the Stikine Terrane (Fig. 2.3.1). The stratigraphic units are intruded by foliated Triassic to non-foliated Jurassic Coast Plutonic Complex diorite stocks, Cretaceous to Tertiary Sloko Group felsic dykes, and Recent Level Mountain Group basalt dykes.

Episodes of folding, faulting and greenschist facies metamorphism have affected the entire package of stratigraphic rocks exposed in the area. Rocks proximal to major faults have typically been carbonatized or silicified and are locally associated with precious and base metal mineralization.

More recent Quaternary deposits, glaciation and slope movements have created some extreme features such as the Bearskin Creek landslide and the present topographic surface.

Geology

The oldest rock unit that occurs within the map area is a slice of ultramafic rock of tectonic origin (Fig. 2.3.1). Otherwise, the Golden Bear area is dominated by a conformable stratigraphic succession of carbonate rocks and mafic volcanic rocks of the Stikine Terrane.

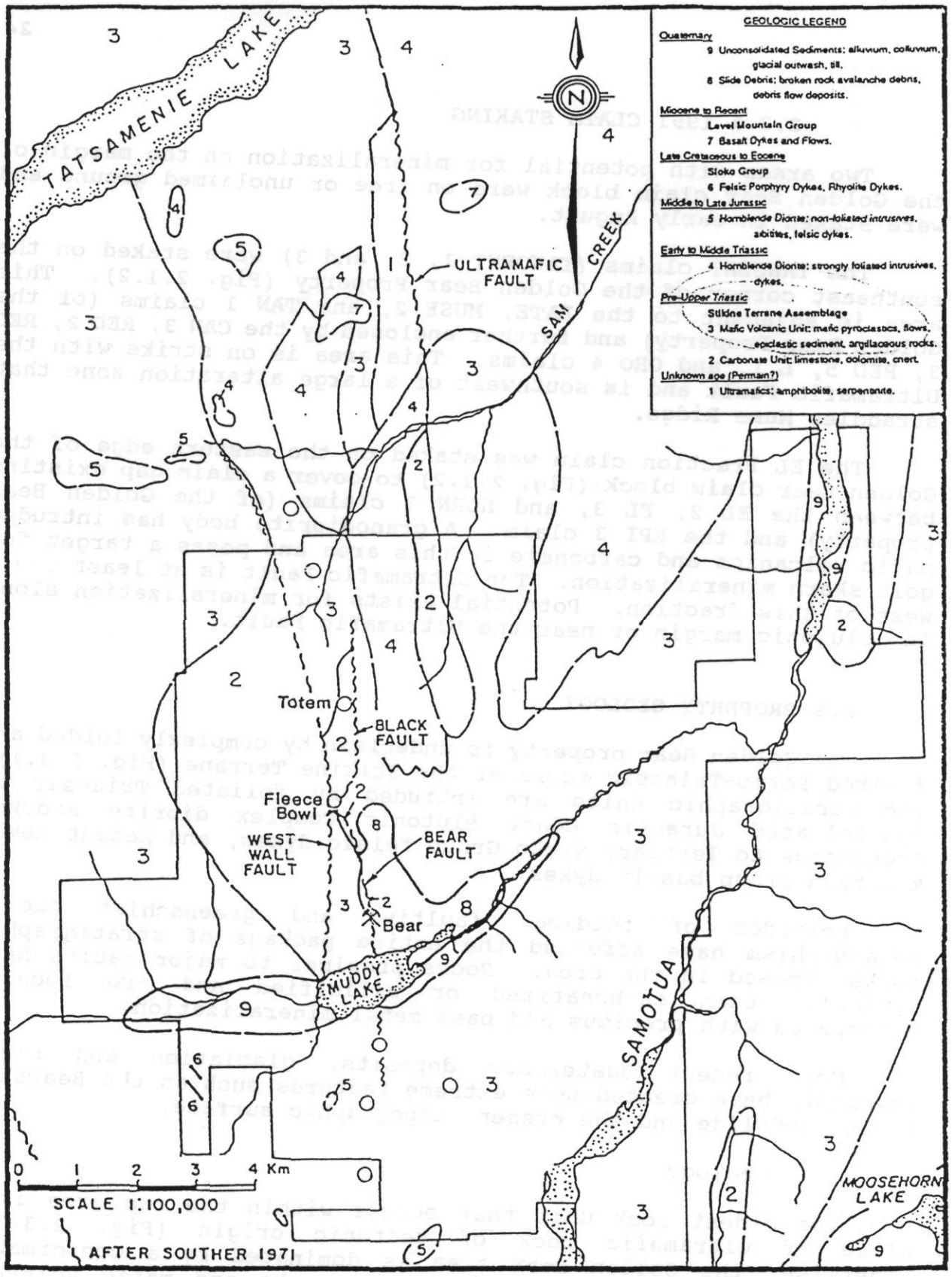


Figure 2.3.1 Generalized geology map of the Golden Bear Mine property.

Rock names used in property-scale geological mapping and core logging have been reduced to four letter codes (McDonald and Reddy, 1990; Appendix D). General lithologies are described from oldest to youngest in the following paragraphs. Property specific four letter rock codes are indicated in bold type in parentheses following general rock names.

Ultramafic rocks (pre-Permian), largely serpentinite, occur along deep-seated, steeply-dipping fault zones just north of the central portion of the property. These rocks have been tectonically emplaced and do not fit conformably into the local stratigraphy. Age is unknown, but is possibly Permian (Souther, 1971). The major fault structures that contain the slices of ultramafic rock cut across the property, but no ultramafic rock is exposed within the claim block.

The **carbonate unit** (Permian) is the oldest stratigraphic unit on the property and is at least 300 m thick. Lithologies comprising this unit include limestone (**LMST**), dolomite (**DOLO**), and chert (**CHRT**) (Figs. 2.3.1 and 2.3.2). The carbonates form a massive, resistant ridge that outcrops on the western edge of the claim block. Permian fusulinids, crinoids and minor coral fossils in the limestone indicate a shallow marine, carbonate bank depositional environment. Fossil ages define a Permian age for this unit (Monger and Ross, 1971).

Within the carbonate unit is a poorly bedded, cream coloured limestone (approximately 150 m thick) that forms the base of the carbonate succession. This is locally overlain by a thin (less than 5 m) white dolomite bed. Thin bedded, buff-weathering crinoidal limestone (**LMBC**) overlies these two units. The crinoidal unit is up to 50 m thick and is a useful marker horizon on the property (Oliver and Hodgson, 1989). Up to 100 m of carbonaceous, "dirty" limestone with local amorphous silica inclusions and black chert interbeds (**DOCH**) overlies the marker unit. The carbonate succession is capped by a distinct black chert unit up to 30 m thick.

A variety of breccias and brecciation textures have been observed in the carbonates including: intraformational beds of monolithic sedimentary breccia (Wober and Shannon, 1985), crackle brecciation where carbonate beds are tightly folded, karst solution collapse breccias (Lowey 1986; Read 1986) and tectonic-hydrothermal breccias related to mineralization (**DOSB**, **CHSB**, **DOXB**, **CHXB**).

The change from deposition of biogenic limestone to chert possibly reflects increasing amounts of silica added to seawater by submarine hotsprings associated with the onset of mafic volcanism (Lehrman and Caddey, 1989). Oliver (Oliver and Hodgson, 1989) mapped a 50 m thick unit that he described as "transitional volcaniclastics" at the contact between the carbonate unit and the overlying mafic volcanic unit. This transitional unit includes

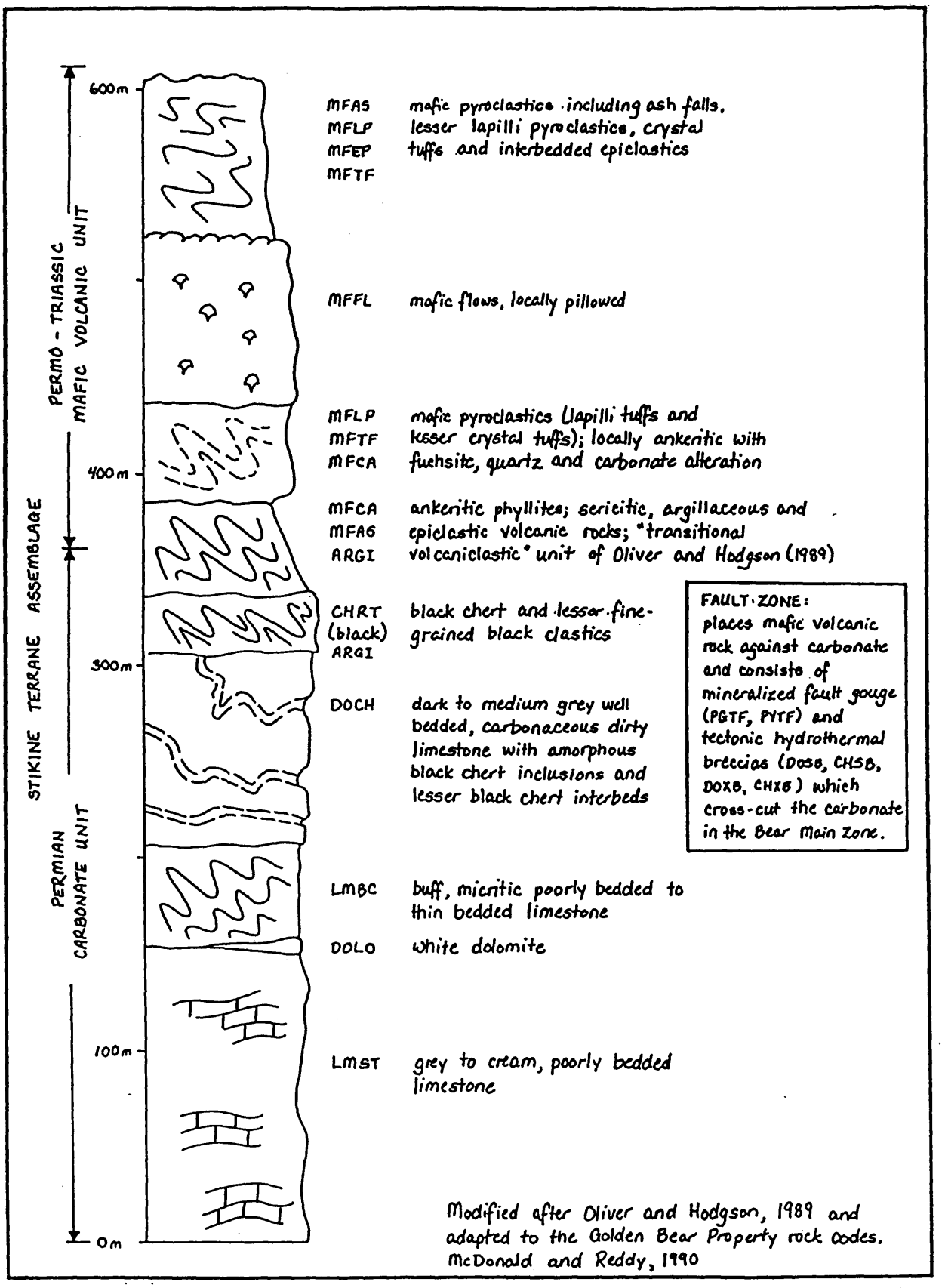


Figure 2.3.2 Generalized stratigraphic section of the main lithologies on the Golden Bear property.

ankeritic phyllites (**PHYL**), epiclastics (**MFEP**), and argillaceous (**ARGI**) rocks. The transition from limestone to chert to mafic volcanic rock is considered conformable on a regional scale.

The **mafic volcanic rock unit** (Permo-Triassic) is at least 200 m thick. This unit consists of mafic flows with local pillows (**MFFL**), pyroclastics ranging from ash (**MFAS**) to lapilli-sized fragments (**MFLP**), and epiclastic sediments (**MFEP**). Mafic volcanics dominate the central and southern portions of the property (Fig. 2.3.1). The unit is a generally monolithologic succession that was deposited in a back-arc environment. Mafic volcanics are relatively unaltered, except near major fault zones where they can be extensively carbonatized (**MFCA**) and silicified.

Four main units that intrude the stratigraphic rocks within the Golden Bear area are as follows: (1) gabbro sills; (2) granodiorite and diorite stocks; (3) felsic dykes; and (4) basalt dykes. These units are described from the oldest to youngest in the following paragraphs.

Contact relationships between **gabbro sills** (GBRO) and the overlying mafic flows and pyroclastic rocks suggest that the gabbro may be, in part, subvolcanic and coeval with the lower Triassic mafic volcanic rocks (Oliver and Hodgson, 1990). These sills intrude the mafic volcanic rocks and form dark, resistant ridges at the top of East Bowl but do not appear on a property scale map. The contacts of the gabbroic intrusives are often marked by chilled margins or by clay gouge zones. Gabbro forms the majority of the slide material that has blocked the Bearskin Creek valley forming Bearskin Lake.

Granodiorite and diorite intrusions of the Coast Plutonic Complex are Triassic (foliated; **GRDF**) and Jurassic (non-foliated; GRDI) in age (Souther, 1971). Foliated hornblende diorite intrudes the mafic volcanic rocks in the north central part of the claim block. The strong metamorphic foliation and alteration in these intrusives resulted from middle Triassic tectonic activity (Souther, 1971).

Non-foliated hornblende diorite intrusives are relatively uncommon. A middle to late Jurassic age (156 Ma to 171 Ma) has been assigned to these intrusives based on dates obtained from similar rocks in the surrounding area (Hewgill, 1985; Schroeter, 1987).

Titley (1987) describes felsic dykes, that he equates to the non-foliated diorite, on the TOTEM claim and felsic stocks south of Bearskin Lake where they intrude the pre-Upper Triassic mafic volcanic rocks.

The mineralized felsic dyke in the Fleece Bowl Zone is hydrothermally altered adjacent to the mineralized Fleece Fault.

This dyke has not been successfully dated, but seems to predate mineralization. The relationship with the hydrothermal system is not known (Titley, 1987).

Felsic volcanic rocks (RHDY; Late Cretaceous to Early Tertiary) of the Sloko Group, cut the Stikine greenstones. These rhyolite dykes also occur as part of a dyke swarm that parallels the contact of a large body of Sloko Group felsic extrusives 2 km west of the property (Titley, 1987).

Basalt dykes (BSDY; Miocene to Recent) of the Level Mountain Group are minor in extent but they intrude all units including mineralization. These dykes trend north-south and are steeply inclined, roughly parallel to the main fault structures. Level Mountain Group volcanic rocks form large shield volcanoes east of the property. Basalt flows outcrop 4 km north of the property.

Structure

Three deformational events have affected the rocks in the Golden Bear area. The first two events are the most significant. The first phase of deformation occurred during the Tahltanian orogeny (middle Triassic) and resulted in tightly folded north-trending isoclinal folds with thinned limbs and axial planes that dip steeply to the east. Fold axes plunge shallowly to the south. Greenschist facies metamorphism accompanied the deformational event and a regional axial planar foliation was developed.

As the first phase of folding progressed, early ductile folding gave way to brittle faulting which developed a variety of faults and fractures. Large north-trending structures such as the precursor to the "Ophir Break" were developed at this time. These large scale faults later became host to district mineralization.

A second phase of deformation (early to middle Jurassic) resulted in refolding of the stratigraphy into broad, open northwest-trending, moderately southeast-plunging folds. A complex fold interference pattern resulted (described in detail in Lehrman and Caddey, 1989).

During the second phase of deformation, brittle structures were also developed. Earlier structural features were modified and reactivated during the second event. Renewed movement on major faults probably produced the structural dilations along the Ophir Break. Golden Bear mineralization was coincident with this second event of deformation.

The third phase of deformation has been described as a middle Tertiary extensional event which developed block fault structures that penetrate the youngest Tertiary rocks (Souther, 1971).

Quaternary deposits

Quaternary deposits within the Golden Bear area include landslide debris and unconsolidated sediments.

Souther (1971) described the main rock avalanche that impounds Bearskin Lake in the Bearskin Valley. Slide debris extends over 2 square kilometres in area (volume approximately 100 million cubic metres) on the east side of the BEAR claim (Titley, 1987). This slide is speculated to have occurred as a catastrophic rock avalanche that descended onto a wasting glacier in Bearskin Creek valley about 10,000 years ago, thus as the glacier moved, the avalanche debris was carried farther down the valley than otherwise seems possible (Titley, 1987).

Slope movements directly affect the Bear Main Zone. The uppermost part of the Bear deposit has locally been displaced by mass wasting forming the Slide Base Zone and several other small anomalous horizons within the slide material. Rock avalanche debris has been drilled to 40 m depth in some surface drill holes and in underground workings the slide base has been encountered in cross-cuts in the hanging wall of the Bear Main Zone.

Titley (1987) describes the unconsolidated Quaternary sediments on the claim group as:

> consist(ing) of alluvium, glacial outwash, till, alpine moraine, colluvium and felsenmeer. Some broad alluvial or outwash deposits occur in the Samotua River and Bearskin Creek valleys. These form the only large flat areas on the property and are subject to annual floods. Glacial till occurs as thin, scattered, widespread deposits. Alpine moraine forms low ridges and thick accumulations in local areas such as at the top of East Bowl. Thin deposits of colluvium and felsenmeer cover much of the claim block and often obscure bedrock geology.

2.4 MINERALIZATION

Golden Bear is a shear zone hosted, enigmatic gold-silver telluride deposit with epithermal affinities. The Bear Main Zone is a high grade, structurally controlled ore shoot with a vein-like geometry.

Ore grade material is localized along an intermittently mineralized north-trending structure known as the **Ophir Break**. This structure is at least 20 km in length, about 9 km of which is on the Golden Bear Mine property.

On a property scale, the Ophir Break is made up of several major, steeply east-dipping faults which bifurcate and merge to form an anastomosing shear system. Within this zone of sheared rock distinct structures have been identified (Fig. 2.4.1).

On the deposit scale, the **Bear Main Fault** occurs along the eastern margin of the Ophir Break. This fault juxtaposes carbonatized mafic volcanic rock on the hanging wall, against carbonate rock in the footwall. Further west, the **Footwall Fault** is the western boundary of the carbonate rock package and places carbonate in the hanging wall against mafic volcanic rock in the footwall. The result is a fault-bounded sliver of carbonate rock central to the Ophir Break. The main carbonate lens outcrops over part of the Bear Main Zone and pinches out at depth. The carbonate lens is continuous along strike, at approximately the 1400 m level, from 23670N to at least as far north as 24835N.

This lens of carbonate rock is, itself, cut by the **Internal Sliver Fault** (Fig. 2.4.1). The Internal Sliver Fault is a riedel shear structure which is en echelon and at a low angle to the direction of relative movement on the Bear Main and Footwall Faults. The Internal Sliver Fault connects the Bear Main and Footwall Faults due to a moderate east dip. This fault separates the carbonate into two lenses and displaces them such that the east lens "rides up" onto the west lens in a reverse sense of fault movement.

The Internal Sliver Fault splits into two faults; the **Internal Sliver Footwall Fault** and the **Internal Sliver Hanging Wall Fault**, which follow the volcanic/carbonate contacts. The Internal Sliver Footwall Fault merges up section, with the Footwall Fault, where the west lens of carbonate pinches out. The Internal Sliver Hanging Wall fault merges up section with the Bear Fault, where the east lens of carbonate pinches out.

Foster's Fault is a large fault zone in mafic volcanic rock and argillaceous tuffs west of the Footwall Fault, near the western margin of the Ophir Break. The **West Wall Fault** (Fig. 2.3.1) places mafic volcanic rock in the hanging wall against a footwall of limestone. At present, significant mineralization has not been identified in association with these westerly structures.

Mineralization is associated with the fault structures that bound and/or shear the dolomite lozenges. Preferential mineralization, or thickening of a zone, occurs at the confluence of these major fault structures. Deposit-scale structural control is also expressed by preferential mineralization along and within right-handed strike deflections and flatter east dipping segments in the Bear Main Fault. Locally, lesser mineralized zones follow splits and splays off the main fault structures.

Ore grade material is commonly, but not invariably, associated

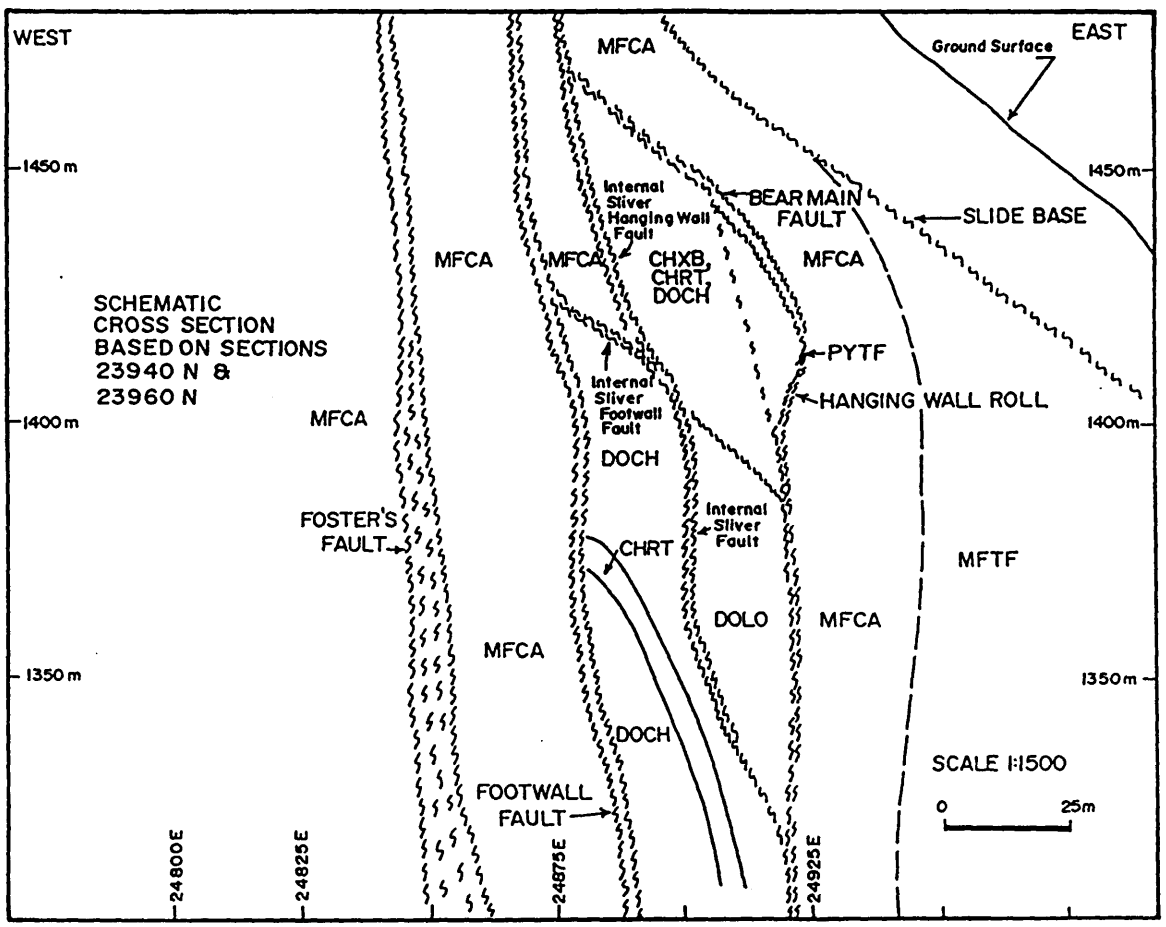


Figure 2.4.1 Cross-section of the Bear Main Fault and associated structures.

with up to 3% pyrite in sheared mafic tuff and is locally accompanied by bleaching and chlorite-sericite-ankerite-fuchsite(?) alteration of the mafic volcanic rocks.

Golden Bear is not typical of epithermal type deposits in that there are no well-defined veins or vein systems. Although the overall geometry is vein-like, the deposit is better described as a mineralized fault zone in contact with hydrothermally cemented chert/carbonate breccia along a structural dilatancy.

Specific deposit characteristics which generally support an epithermal classification as well as a conceptual genetic model for the formation of and mineralization in the Bear Main Zone is discussed in detail in Lehrman and Caddey (1989).

2.5 WORK HISTORY

The remote and rugged nature of northwestern British Columbia has restricted mineral exploration to coastal areas until fixed wing aircraft and helicopters made inland access easier. The first claim staked near Bearskin Lake was in 1956 by K.A. Gamey (Nicko No. 30, Record No. 3077, Tag No. 228415; Titley, 1987) on some copper showings. Until 1980, no further exploration work was been recorded.

J.G. Souther (1971) of the Geological Survey of Canada mapped the Tulsequah map sheet (104K) providing the main regional geologic framework for the area.

In 1979-1980, C. Dyson of Chevron Minerals Ltd. (CML) was studying the epithermal gold potential of several areas in British Columbia (Wober and Shannon, 1985). A small reconnaissance program on the Tulsequah map sheet was conducted by L. Dick (CML) in 1980. The program was initially focused on alteration zones with associated antimony and arsenic occurrences north of Tatsamenie Lake (Wober and Shannon, 1985).

In 1981, CML staked 43,000 acres in 10 claim groups; one claim group included the Bear Main Zone (Wober and Shannon, 1985). During the summer of 1981, a reconnaissance soil traverse at 300 m sample spacing along the north side of the Bearskin Creek valley returned an assay value of 700 ppb Au. Follow-up contour soil sampling at 100 m spacing produced a high of 9,200 ppb Au from an area directly below what is now the Bear Main Zone. Grab samples taken in this area assayed up to 24.0 g/t Au (0.7 opt Au; Wober and Shannon, 1985).

In 1982, the Bear Main Zone was discovered and trenching, prospecting, chip sampling and mapping were carried out. Samples from the 13 m wide, 175 m long zone produced an average assay of 9.3 g/t Au (0.27 opt Au). Mineralization discovered in the Fleece

Bowl area produced 1 to 2 g/t Au assay results (Wober and Shannon, 1985).

In 1983, trenching continued and drill road building and drilling commenced on the BEAR and TOTEM claims. 25 diamond drill holes were completed on the BEAR claim and 5 were drilled on the TOTEM claim.

The project was expanded in 1984 when 4 diamond drills completed 58 holes on the BEAR and TOTEM claims. Drilling was concentrated on the Bear Main Zone, the Fleece Bowl Zone and the Totem Zone. Parts of the BEAR and TOTEM claims were mapped during the 1984 exploration season.

No new mineralization was discovered in the scaled-down 1985 exploration program. 14 diamond drill holes were completed on the BEAR claim and 17 were drilled on the TOTEM claim. Surface trenching and mapping continued. Geological reserves of 1.025 million tonnes of 13 g/t Au, (1.13M tons of 0.38 oz/ton Au) oxidized and refractory ore was indicated in the Bear and Fleece Zones (Wober and Shannon, 1985).

In June 1986, North American Metals Corp. became a 50% joint venture partner with Chevron Minerals Ltd. in the Bear-Totem option agreement. Underground development work commenced with drifting on the 1400 m level at this time.

In 1986 and 1987, 87 underground and 13 surface holes were drilled to further define the ore body. By 1988, 2000 m of underground development had been completed.

A feasibility study presented in July 1987 by Wright Engineers Limited indicated that the Golden Bear Project could be successfully brought into production. In the same month North American Metals Corp. assigned all of its interest in the Bear-Totem agreement to North American Metals (British Columbia). Mining development began in October, 1987 and at that time, Chevron and North American Metals (British Columbia) incorporated the Golden Bear Operating Company (GBOC) as an independent service company to operate the Golden Bear Mine Project. A minable ore reserve in the Bear Main Zone of 625,390 tonnes at 18.6 g/t Au had been identified by Wright Engineers Limited and American Mine Services Inc. Mill construction took place in 1988 and 1989 and mining commenced in 1989.

In April 1988, Homestake Mining (B.C.) Ltd. acquired a 73.3% interest in North American Metals Corp. and became an active participant in the project. Exploration had experienced a two year hiatus between the end of 1987 until the end of 1989. The exploration effort was revived in 1990 and comprised partial compilation of work from previous years and a limited program of diamond drilling of 2295.12 m in 19 holes immediately north and

south of the main deposit area.

In 1991, compilation of previous work and diamond drilling continued. 4368.85 m of diamond drilling was completed on surface, both north and south of the main deposit, on Troy Ridge and on the Zed Road respectively (Fig. 1.1.1). 607.91 m of underground diamond drilling was completed north of the main deposit.

Other recent non-exploration studies in the Golden Bear area include government publications by T. G. Schroeter and J.L. Oliver and C.J.Hodgson. Schroeter (1985, 1986, 1987) summarized Golden Bear geology based on Chevron Minerals Ltd. work. Oliver and Hodgson (1989, 1990) have been conducting regional mapping from the Bearskin Creek valley to north of Tatsamenie Lake as part J.L. Oliver's Ph.D. studies.

Table 2.5.1 **GOLDEN BEAR PROJECT DRILL HOLE SUMMARY.**

Bear Drilling 23500N-25300N

Year	# of Holes*	Actual #	Total Meterage	Sum
1983	27	25	4,617.45	
1984	24	22	4,487.20	
1985	16	14	2,006.28	/ 11,110.93m
1986	26	25	1,896.91	
1987	78	76	3,569.28	
1988	3	3	309.07	/ 5,775.26m
1989	-	-	-	
1990	20	19	2,295.12	
1991	22	21	**5,015.76	/ 7,310.88m
	216	205	24,197.07	

Totem Drilling 25300N-28100N

Year	# of Holes*	Actual #	Total Meterage
1983	5	5	772.82
1984	34	34	5,760.00
1985	17	17	2,327.31
	56	56	8,860.13

Total Drilling on the Golden Bear property

# of Holes*	Actual #	Total Meterage
272	261	33,057.20

*includes abandoned holes i.e. B83DH27A
**includes 322.38m of ODEX drilling

3. 1991 EXPLORATION PROGRAM

3.1 SCOPE AND LOGISTICS OF EXPLORATION

Exploration on the Golden Bear Mine property in 1991 was conducted between May 8th and September 16th by a geologic staff of up to nine people. Total budget for 1991 exploration was $ 1.2M (Appendix A).

Exploration activity was based out of existing camp and office facilities which service mining and milling operations at Golden Bear Mine. Exploration operations before May 8th and after September 16th were conducted out of the Vancouver offices of Golden Bear Operating Co. Ltd.

1991 exploration was directed toward:

(1) delineating additional reserves proximal to present mine workings to replace material that was mined this year;

(2) identifying or drilling targets with potential to at least equal reserves which exist in the Bear Main Zone.

Regional exploration was also conducted to identify areas with potential to host ore structures.

In 1991, exploration work was conducted on six areas; East Bowl, Troy Ridge, Muse Ridge and east Muse Ridge, Fleece Creek, Highway Creek and Fleece Bowl (Table 3.1.1, Fig. 3.1.1). Three targets (Bear South, Bear North underground and Troy Ridge) were drilled in the East Bowl area. In addition to drilling, 1:1000 scale mapping was carried out on Troy Ridge, and 1:5000 scale reconnaissance work was initiated on Muse Ridge, east Muse Ridge as well as Fleece and Highway Creek areas. An investigation into the Fleece Bowl resource was also initiated this year by relogging all core from the previous Fleece Bowl drilling.

A total of 637 rock and 1311 soil samples were collected during surface exploration work, with 28 percussion chip samples and 2357 core samples taken in drill tested areas.

Odex drilling was carried out on a contract basis by Midnight Sun Drilling Co. Ltd. of Whitehorse, Yukon from May 15 to May 29. The percussion drilling was carried out using the 115 ODEX system with a truck mounted T450H Schram air rotary rig.

The ODEX drilling system was used to "precollar" planned drill holes in the Bear South area by boring through landslide and overburden material intersected at the top of the holes, which, in 1990 diamond drilling, had proved to be both difficult and

Table 3.1.1 **EXPLORATION AND TARGET AREAS EXAMINED in 1991.**

Exploration Area	Target Area
East Bowl	Bear North (U/G) Bear South
Troy Ridge	
Muse Ridge and east Muse Ridge (South side of Lake)	
Fleece Creek	
Highway Creek	
Fleece Bowl	

expensive (Reddy, 1991a, 1991b). In May, 322.38m of ODEX percussion drilling was completed in 8 precollars at an average rate of 21.82m per shift (3-man day shift only).

Diamond drilling was carried out on a contract basis by F. Boisvenu Drilling Ltd. of Delta, British Columbia. One skid mounted Val D'Or 3000 diamond drill was used for surface drilling between June 5 and September 6. The drill was used to produce HQ, NQ, and BQ size core. During the surface drilling program 4085.47m of core were drilled in 15 holes at an average rate of 21.73m per shift. A Komatsu D-6 tractor was also supplied to level out drill pads and move the drill between pads.

One Connors 1000 diamond drill was used for underground drilling between August 15 and September 9. The drill was capable of producing NQ or BQ core. Whenever possible NQ core was drilled, however, under difficult ground conditions, size reduction to BQ core was required. Between August and September, 607.91m of core were drilled in 7 holes at an average rate of 11.69m per shift.

A Trans North Air Bell 206B helicopter was used on a casual basis for fieldwork. The helicopter was based in the Trapper Lake field camp.

3.2 1991 EXPLORATION TARGET AREAS

3.2.1 BEAR SOUTH

Introduction

The Bear South area is a south facing slope that extends from the 1360m level portal to Bearskin lake (Figs. 1.1.1 and 3.1.1). In 1990, this area was targeted for diamond drilling aimed at tracking the Ophir Break structures southward to potentially mineralized and structurally favourable zones (Lehrman and Caddey, 1989). The 1991 diamond drilling program followed up on the drilling initiated in 1990 and continued testing the Bear Fault southwards to 23150N.

Geology

Geology of the Bear South area consists of four main lithologies, from oldest to youngest they are: (1) carbonates; (2) chert with interbedded argillite; (3) mafic volcanics; and (4) gabbro (Oliver, 1990) (Fig. 3.2.1). Bearskin Creek landslide (gabbro debris) and the Zed Road obscure outcrop in the northeastern part of the grid.

Carbonate rocks outcropping on the west edge of the grid and within the core of a northwest trending anticline, form the base of the stratigraphic section in this area (Oliver, 1990). Oliver (1990) has subdivided the carbonates into 3 units as follows:

> The oldest carbonate rocks are thin bedded buff weathering limestones. These are conformably overlain by dark grey limestones and sometimes by a thin, 5.0 meter thick, white to cream dolomite horizon.

Mafic volcanic rocks are the predominant lithology on the grid area. Oliver (1990) describes these flows and tuffs as follows:

> Mafic volcanic flows, sometimes pillowed, and usually weakly vesicular, conformably overlie limestone. This basaltic flow succession grades upward into a thick sequence of plagioclase porphyritic crystal tuffs and flows. Few internal markers are present in either of these rock units. Stratigraphic and structural relations suggest that over much of the Bear South grid, these units strike 045° and dip modestly, 30 to 50°, southeast.

These mafic volcanic rocks are locally sheared and can be intensely carbonatized where proximal to faults such as the Bear Fault, West Bear Fault, and Foster's Fault. Oliver (1990) states:

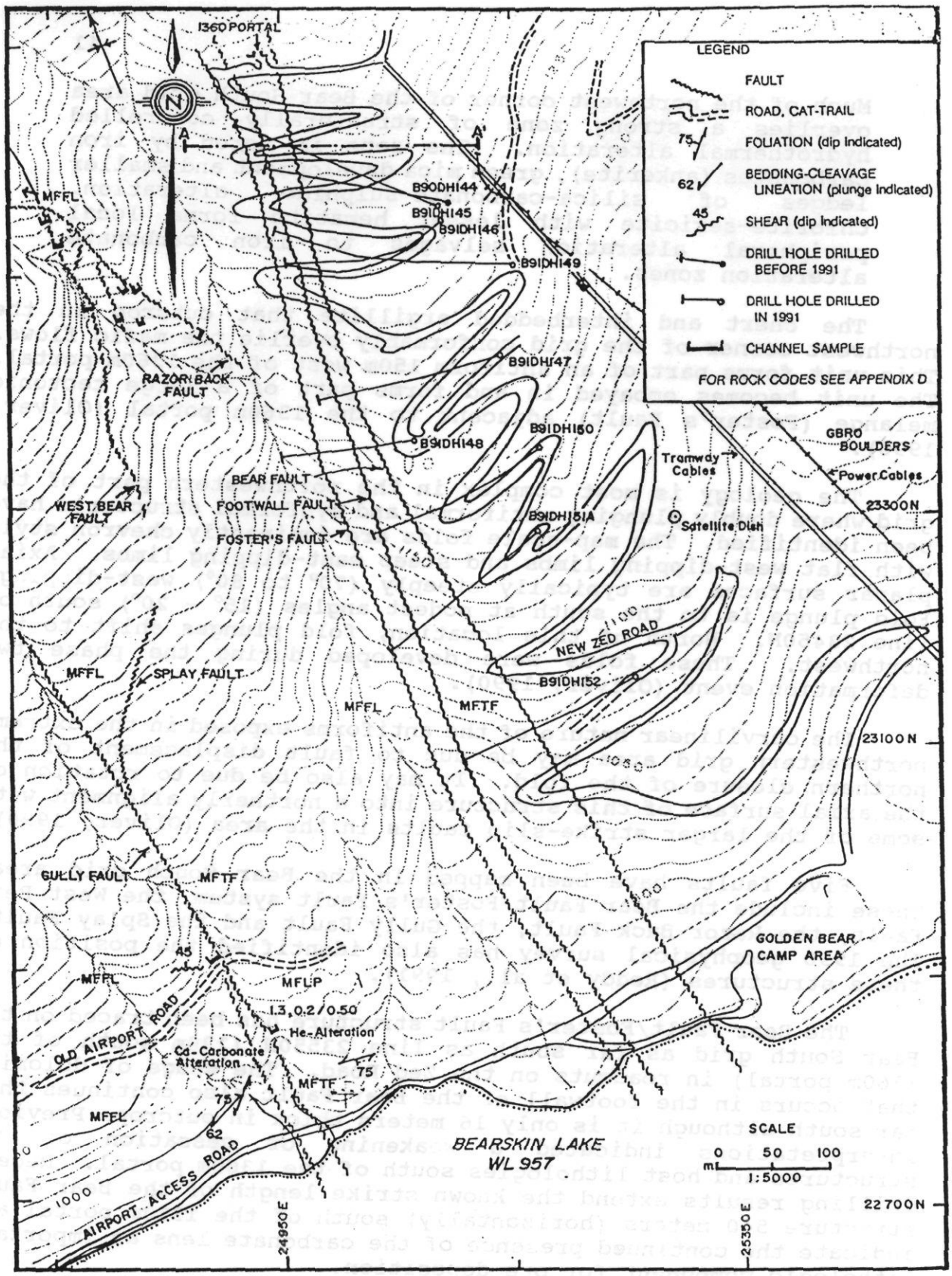


Figure 3.2.1 Summary of Bear South geology and 1991 drill hole locations.

> Much of the northwest corner of the Bear South grid area overlies a strong zone of structurally controlled hydrothermal alteration. The zone is cored by iron carbonates (ankerite), green mica development and smaller ledges of silica-carbonate-sulphide alteration. Chlorite-sericite with lesser hematite forms local peripheral alteration selvages to iron carbonate alteration zones.

The chert and interbedded argillite that outcrop in the northwest corner of the grid conformably overlie the mafic flows. This unit forms part of an antiform 150m west of the 1360m portal. The unit becomes embayed in and forms part of a large tectonic melange (Foster's Fault) adjacent to the 1360m portal (Oliver, 1990).

The geology is most complex in the northwestern part of the grid where doubly plunging antiformal and synformal structures have been identified. The map-scale folds are dominantly chevron style with flat west-dipping limbs and steep east-dipping limbs. Axial planar surfaces are typically steeply (70° to 80°) west-dipping. Fold plunge is to the south at modest angles (15° - 20°) south of line 23450N. North of this location, fold plunges shift to the northwest. These folds were developed during the phase two deformation event (Oliver, 1990).

The curvilinear nature of the antiforms exposed in the extreme northwestern grid area may be due to fault displacement of the northern closure of the fold. It may also be due to rotation of the axial surface of this structure into a northerly alignment with some of the larger strike-slip faults in the area (Oliver, 1990).

Five faults have been mapped in the Bear South grid area. These include the Bear Fault/Foster's Fault system, the West Bear Fault, the Razor Back Fault, the Gully Fault and the Splay Fault. The 1990 geophysical survey has also identified the position of these structures (Reddy et al., 1991).

The Bear Fault/Foster's Fault structure has been traced on the Bear South grid as far south as line 23550N (120m south of the 1360m portal) in roadcuts on the Zed Road. The wedge of dolomite that occurs in the footwall of the Bear Fault also continues this far south although it is only 16 meters thick in outcrop. Previous interpretations indicated a weakening or cessation of the structures and host lithologies south of the 1360m portal. Recent drilling results extend the known strike length of the Bear Fault structure 540 meters (horizontally) south of the 1360m portal and indicate the continued presence of the carbonate lens an important lithologic component for ore deposition.

South of 23500N, landslide debris conceals the trend of the Bear Fault/Foster's Fault system. A colour anomaly, visible on air

photographs, coincides with a VLF-EM anomaly over the main structure and suggests a south-southeast trend for these major faults across the southeast portion of the grid.

The West Bear Fault (WBF) is a north-northwest trending shear located approximately 200 meters west of the Bear Fault. The WBF is continuous over a 100 meter strike length and places hanging wall carbonate altered mafic volcanic rock against footwall limestone.

The northwest-trending Razor Back Fault (RBF) is 50 meters in strike length and merges with the WBF near the western end of line 23550N. Carbonate alteration of mafic volcanic rocks is also associated with this structure.

The WBF and the RBF are both normal faults and are likely conjugate structures to the large reverse faults in the area, i.e. Foster's Fault. Together these faults comprise a sheared and carbonate altered zone up to 50 meters across. Siliceous dolomite breccias are developed in the area bounded by the two structural zones. The style and form of these breccias is similar to those seen in the footwall of the Golden Bear Deposit.

The Bear Fault/Foster's Fault structure, the WBF and RBF define a diamond shaped block of intense, structurally controlled alteration and isolate a downthrown graben (Oliver, 1990).

The northwest trending, 400 m long Gully Fault parallels a creek in the southwest area of the Bear South grid. The north-trending, 160m long Splay fault splits from the northern end of the Gully Fault. Both faults cut mafic tuff and mafic volcanic flow rock. No significant mineralization has been identified along these structures, although graphitic gouge has been noted locally in the Gully Fault. Both structures have a strong geophysical signature.

Previous Exploration

In 1981 and 1982 a soil and silt geochemical survey was conducted over an area that included the Bear South Grid.

Strong gold, arsenic and antimony anomalies were defined over the trend of the known ore bearing structure and as far south as 23350N. The anomaly defined by gold results includes values greater than 10,000 ppb with considerably lower gold values to the south. A moderate arsenic anomaly straddles Alpha Gully from 23250N south to the lake shore. Two arsenic highs on the southeastern edge of the Bear South grid indicate a bend to the southeast in the main structure in this location.

In 1990, a 900m by 700m (50m line spacing, 25m station

spacing) slope corrected grid was re-established over the Bear South area. J. Oliver completed a 1:1000 scale geology, alteration and structure map of the grid area (detailed results in the 1990 Golden Bear Exploration report). Mapping by both Chevron personnel and J. Oliver indicate a zone of sheared, carbonatized mafic volcanics on strike with the projected trend of the Bear Fault.

A VLF-EM geophysical survey conducted by Chevron personnel in 1985 includes the Bear South Grid. Compiled results indicate a series of north-northwest trending linear VLF high and low anomalies. A strong VLF low occurs immediately over the Bear Fault structure. The anomaly becomes weaker from 23350N southwards where it becomes discontinuous. Although several southeast trending anomalies continue from 23200N to Bearskin Lake, they cannot be positively attributed to the Bear Fault. Telephone lines that parallel the Bear Fault may have interfered with interpretations of the location of the structure.

A linear north trending VLF high of short strike length (less than 100 meters) occurs at approximately 23050N, 25225E. This anomalous trend is coincident with the current position of the satellite dish. Ankeritic mafic volcanic rock noted by Chevron personnel and J. Oliver outcrops in the area.

Geophysical surveys were conducted on the re-established Bear South grid by Delta Geoscience Limited in 1990. Telephone lines that may have interfered in 1985 were removed. VLF-EM, Horizontal Co-planar Loop E.M. (H.L.E.M.), VLF-Resistivity, and Total Field Magnetic surveys were conducted. Complete details of the survey procedure, equipment and results are included in the 1990 Golden Bear Exploration report.

Previous drilling in the Bear South area by Chevron and North American Metals includes seven drill holes on three lines.

B83DH008, B83DH009 and B85DH087 were drilled to test the Bear structure on line 23700N. In each hole, three limonitic gouge zones carrying anomalous precious metal values were intersected within slide material. B83DH008 confirmed the presence of the carbonate lens at 1309m elevation. B83DH009 intersected the same structures at 1220m elevation although, at this level, no carbonate was intersected. B85DH087 intersected the Bear Fault zone at 1312m elevation (Fig. 3.2.2).

B85DH089 was drilled to test for the existence of the Bear Fault structure on section 23620N. B85DH116 and B85DH117 were short holes drilled to test for the shallow mineralized zones in the slide material. B85DH089 and B85DH117 intersected three locally anomalous fault gouge zones in the slide material. B85DH089 also intersected the Bear Fault, although recovery was very poor (5-20%) across the structure. B85DH116 was abandoned at 30.78 meters.

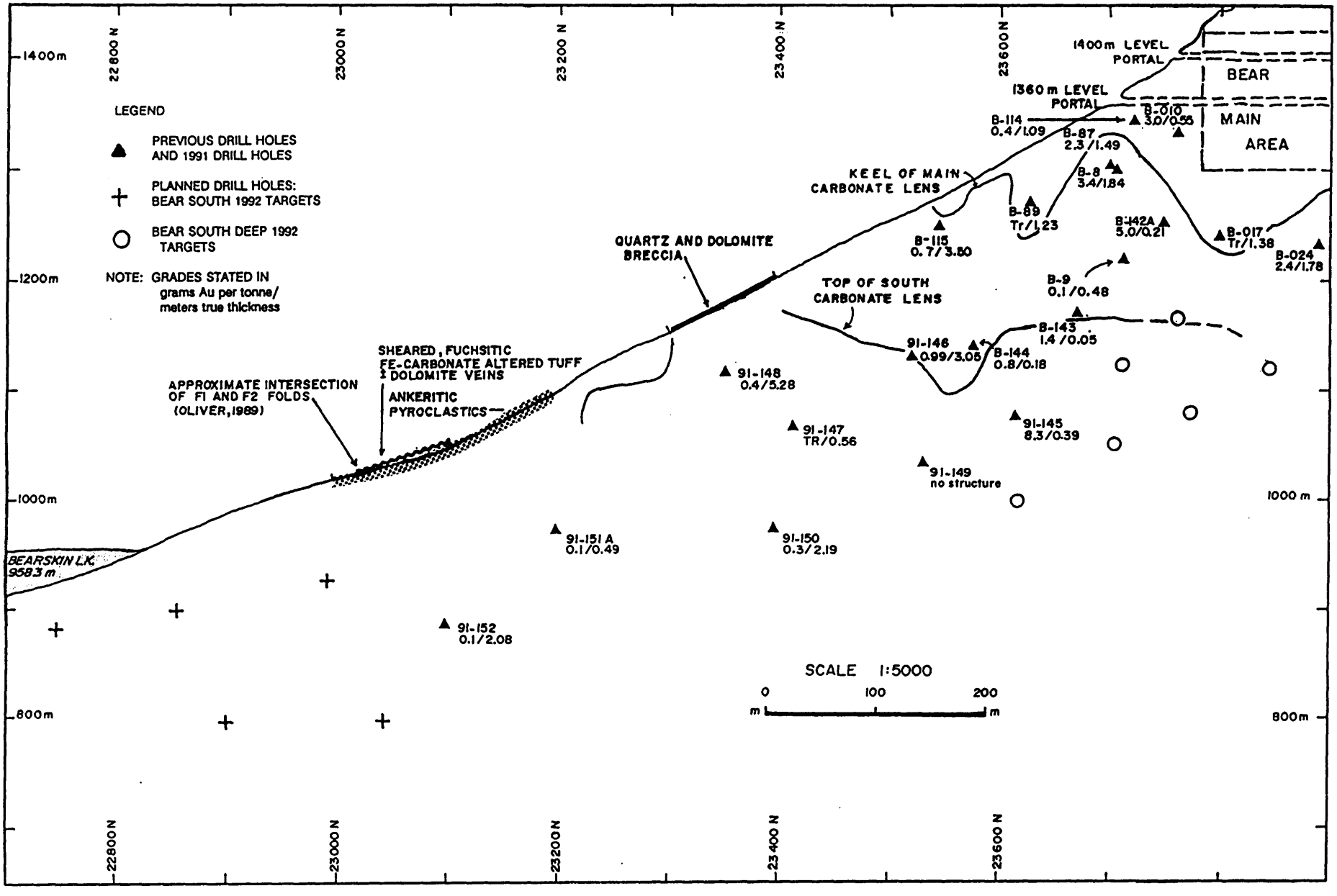


Figure 3.2.2 Bear South area longitudinal section showing locations of intersections on the Bear Fault and proposed 1992 drill intersections.

B85DH115, the southernmost drill hole, did not intersect the carbonate lens at the 1250m elevation. Assay results for two samples are encouraging: 5.0 g/t Au, 13.5 g/t Ag over 0.91m for carbonate altered mafic volcanic rock in the footwall of the Bear structure, and 6.6 g/t Au, 33.0 g/t Ag over 0.30m within the Bear structure (at the base of a 4.5m zone of lost core) (Fig 3.2.2).

In 1990, three diamond drill holes were drilled to test structures within the Ophir Break south of the existing workings. The holes were drilled on 90 meter centers to progressively track the Ophir Break structures southward. Results of the drilling indicate that the Bear Fault extends at least 120 meters south of the 1360 portal and persists down dip at least as far as the 1128m elevation. In the 3 drill holes completed on Bear South in 1990, the Footwall Fault and Foster's Fault remain strong continuous structures but do not carry significant precious metal values.

1991 Activities and Results

Surface work completed in 1991 included channel sampling of the West Bear Fault, the Razor Back Fault, and the Splay and Gully faults. A total of 26 channel and chip samples and 1 soil sample were collected. Eight diamond drill holes were drilled in 1991 delineating the southern extension of the Ophir Break structures as far south as 23150N.

The Razor Back Fault (RBF) extends from the Ophir Break in Alpha Gully (23425N) to 23600N where it is lost in overburden (Fig. 3.2.3). The fault strikes 126° and dips 85° east. The RBF separates mafic epiclastic sediments and mafic flows in the hanging wall from mafic ash tuff and carbonate in the footwall. Where exposed, the fault is 1 to 3 m wide and outcrops as fault gouge flanked by carbonatized mafic volcanics. Samples taken across this structure assayed up to 2.1 g/t Au over 1.00m in Fe-carbonate fault gouge with argillite and chert, and up to 3.2 g/t Ag over 0.40m in silicified and brecciated dolomite.

Proximal to the RBF is a black graphitic shear with two small silicified dolomite breccia zones trending 160°. Samples of this shear zone yielded up to 0.9 g/t Au over 0.10m and 1.6 g/t Ag over 0.80m (Fig.3.2.1).

The West Bear Fault (WBF) strikes 175° and dips steeply (80°) west. WBF is exposed over a 40m strike length and merges to the north with RBF (Fig.3.2.1). To the south, WBF is lost in overburden on surface. However, 1990 VLF-EM and HLEM data suggest that WBF joins the Splay and Gully faults (Fig. 3.3.7 in Reddy et al, 1991). The WBF places carbonate rocks exposed in a cliff face on the hanging wall against carbonatized mafic volcanic rocks in the footwall.

Figure 3.2.3 Photograph, looking northwest, showing the location of the Razor Back Fault and the West Bear Fault in the Bear South area.

In 1991, 5 channel and 3 chip samples were collected on the WBF (Fig. 3.2.3). In 1990, the highest gold assay reported on WBF yielded 1.4 g/t Au and 0.2 g/t Ag over 0.30m in a black graphitic shear. Assay results at the same location report 0.5 g/t Au and 2.4 g/t Ag over 1.02m in black dolomite with interbedded graphitic material and 0.8 g/t Au and 1.6 g/t Ag over 0.15m in carbonatized mafic volcanics. The most southern grab sample from the WBF grades 0.2 g/t Au and 2.0 g/t Ag across a 4m wide outcrop of carbonatized mafic volcanic rock.

The Gully and Splay Faults parallel the Ophir Break and occur approximately 230 meters to the west. These poorly exposed faults cut mafic volcanic flow rocks and are expressed as weak shear zones with associated weak to moderate carbonate alteration. Locally, fault gouge is exposed in outcrop. Between the old and current airport roads rocks on the west side of the Gully fault are highly hematite altered for at least 50 meters off structure. outcrop to the east is extremely calcium carbonate altered and has a probable mafic volcanic origin.

In 1991, there were 3 channel and 4 chip samples taken along the Gully Fault. The best exposure, a graphitic fault gouge, graded up to 1.0 g/t Au over 0.45m (minimum) and 4.0 g/t Ag over 0.60m (minimum). This fault gouge may be a conjugate fault to the Gully fault as it trends 100° relative to the 150° striking Gully fault. The best grades on the Gully fault were in fault gouge at 22860N which yielded 1.3 g/t Au and 0.2 g/t Ag over minimum width of 0.50m (Fig.3.2.1). A second fault parallels the Gully fault and outcrops on a ridge 25 meters to the west. This whole ridge is extremely calcium-carbonate altered. Samples taken from this sheared zone assayed 0.6 g/t Au and 1.4 g/t Ag over approximately 1m.

Drilling in the Bear South area included 322.38m of ODEX drilling in 8 precollars and 1960.87m of diamond drilling in 8 completed holes. Diamond drill hole summaries for each hole can be found in Appendix B of this report and assay results for each hole are reported in Table 3.2.1.

Results of the 1991 drilling show that the Bear Fault extends at least 540 meters south of the 1360m portal and continues down dip at least as far as 892m elevation. The Bear Fault varies in true thickness from 0.05 to 5.28 meters. The highest grades reported on the Bear Fault occurred in B91DH145 at 4.5 g/t Au and 35.9 g/t Ag over 2.75m and 8.3 g/t Au and 88.4 g/t Ag over 0.39m (Fig. 3.2.4). In B91DH145 the Bear Fault is predominantly a pyritic chert breccia. However, to the south, and at greater depths, the Bear Fault intersections are predominantly mafic tuff breccia and fault gouge with minor amounts of carbonate breccia within the fault.

A carbonate lens intersected in B91DH145 occurs in the Bear

GOLDEN BEAR OPERATING COMPANY LTD.
DIAMOND DRILL HOLE SUMMARY FOR 1991 BEAR SOUTH SURFACE DRILLING

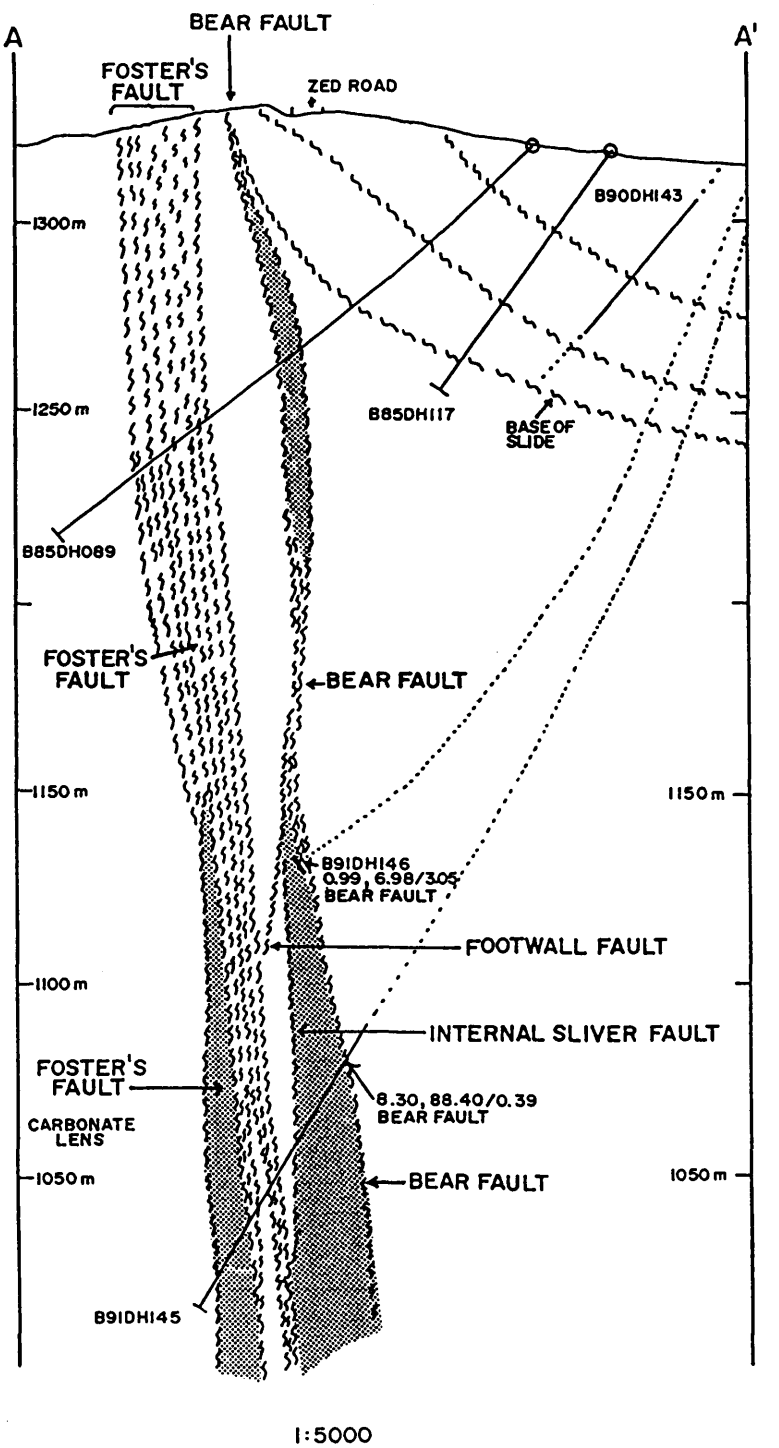
CONTRACTOR: F. Boisvenu Drilling RIG: Val'Dor 3000

DATE	HOLE #	AREA	LOCATION	ELEVATION (m)	AZIMUTH	DIP	LENGTH (m)	INTERSECTION (m)	WIDTH (m)	GRADE/TRUE WIDTH (gms Au/t, gms Ag/t/mtt)	REMARKS
June 6	91-145	Bear South	23561.19 N 25082.87 E	1273.16	284.57°	-59.8°	0.00 to 331.62	229.10 to 229.75	0.65	3.33, 6.80/0.38	Carbonatized mafic volcanic rock within the alteration zone of the Bear Fault.
								231.78 to 236.48	4.70	4.53,35.88/2.75	Bear Fault Zone: consists of a silicified and sulphide-rich chert breccia with only one lost portion of 0.78m. Highest grade within zone was 8.30, 88.4/0.39mtt.
								240.79 to 241.54	0.75	4.18, 31.0/0.44	Dolomite and interbedded chert with patches of fine grained sulphides.
								260.34 to 263.14	2.80	2.01, 6.61/1.27	Internal Sliver Fault?: pyritic gouge and sulphide-rich chert breccia cross-cutting the carbonate+chert lens.
								267.25 to 268.90	1.65	1.36, 1.56/0.86	Footwall Fault: pyritic gouge and sulphide-rich chert breccia on the footwall side of the carbonate+chert lens.
								268.90 to 273.78	4.88	0.55, 0.56/2.49	Foster's Fault: clay gouge and sheared zone, adjacent to the Footwall Fault.
June 11	91-146	Bear South	23546.73 N 25082.38 E	1272.96	240.72°	-53.9°	0.00 to 204.52	200.08 to 204.52	4.44	0.99, 6.98/3.43	Bear Fault Zone: consists of pyritic gouge and silicified chert. The interval also includes two lost portions totalling 1.15m. and a 0.47m (core length) basalt dyke. The highest assay was 6.93, 7.40/0.30mtt. This hole was abandoned within the zone thus, it is a minimum structure width.
June 19	91-147	Bear South	23434.98 N 25134.95 E	1210.42	253.95°	-50.4°	0.00 to 257.86	195.45 to 196.20	0.75	Tr , 1.03/0.56	Bear Fault: fault gouge with pyritic zones and silicified argillite.
								213.66 to 218.20	4.54	1.48, 5.37/3.05	At contact between chert and limestone within main "carbonate/chert" lens.
								222.05 to 223.11	1.06	0.55, 3.60/0.71	Internal Sliver Fault: gouge within dolomite and chert unit.
								225.40 to 226.78	1.38	0.26, 2.58/0.96	Footwall Fault: silicified, brecciated dolomite in contact with altered volcanics.
								228.45 to 229.55	1.10	7.37, 5.20/0.77	Crackle brecciated epiclastic sediment following the Footwall Fault structure.
								233.87 to 241.69	7.82	0.13, 4.32/5.46	Foster's Fault: hematitic gouge with carbonatized mafic volcanic fragments; 0.21m lost.
June 27	91-148	Bear South	23365.54 N 25061.45 E	1206.71	256.64°	-51.6°	0.00 to 179.53	86.07 to 86.43	0.36	1.06, 3.2 /0.36*	Carbonatized mafic volcanic rock.
								87.83 to 88.01	0.33	2.95, 1.76/0.33*	Carbonatized mafic volcanic rock.
								115.00 to 117.00	2.00	5.62, 1.00/1.61	Carbonatized mafic volcanic rock prior to the Bear Fault structure.
								119.09 to 125.64	6.55	0.39, 1.67/5.28	Bear Fault: brecciated, silicified, pyritic chert with altered volcanics; 0.82m lost. This hole intersects the confluence point of the Bear and Footwall Faults.
								125.64 to 126.12	0.48	0.22, 1.00/0.33	Footwall Fault: pyritic gouge immediately following the Bear Fault structure.
								145.51 to 150.95	5.44	0.33, 1.16/3.76	Foster's Fault: hematitic fault gouge and sheared altered volcanics.
								150.95 to 157.42	6.47	0.26, 4.16/6.47*	Limestone lens on the footwall side of Foster's Fault with elevated silver values.
July 1	91-149	Bear South	23506.81 N 25145.95 E	1230.67	273.01°	-49.9°	0.00 to 341.07	233.00 to 233.50	0.50	5.02, 1.0 /0.50*	Carbonatized mafic volcanic rock.
								250.22 to 250.22	0.00		Bear Fault: no discernible structure at contact of epiclastic sediment with dolomite.
								268.10 to 270.10	2.00	1.34, 4.1 /2.00*	Dolomite.
								271.17 to 276.06	4.89	3.06, 5.69/3.69	Dolomite variably silicified with minor pyrite; 0.26m lost. Zone of elevated grade from 267.10 to 281.00 has a composite grade of 2.01,4.06/13.44 (10.13mtt).
								282.29 to 285.88	3.59	0.16, 1.31/2.67	Footwall Fault: pyritic, brecciated chert followed by pyritic sheared tuff. The chert breccia has been intruded by a 0.49m basalt dyke.
								291.22 to 301.45	10.23	0.13, 2.42/7.68	Foster's Fault: fault gouge zone contains a lens of dolomite and chert; 0.44m lost.
July 11	91-150	Bear South	23360.40 N 25177.14 E	1169.85	234.02°	-59.9°	0.00 to 313.03	229.00 to 231.78	2.78	0.30, 1.68/2.19	Bear Fault Zone: pyritic sheared tuff with brecciated pyritic chert; 0.36m lost.
								252.12 to 253.10	0.98	1.43, 4.67/0.98*	Silicified, brecciated dolomite with patchy fine sulphides.
								257.14 to 258.17	1.03	0.28, 1.51/0.65	Internal Sliver Fault: brecciated, pyritic chert with zone pyritic tuff.
								261.26 to 261.99	0.73	0.17, 1.60/0.46	? Internal Sliver Fault: pyritic tuff within the "carbonate/chert" lens.
								263.96 to 265.53	1.57	0.51, 2.60/0.99	Footwall Fault: pyritic dolomite breccia at dolomite/volcanic contact; 1.35m lost.
								270.97 to 275.79	4.82	0.14, 1.29/2.68	Foster's Fault: gouge, sheared carbonatized tuff followed by pyritic gouge; 2.67m lost.
July 16	91-151a	Bear South	23281.69 N 25170.64 E	1152.47	225.12°	-51.9°	0.00 to 288.65	221.64 to 222.36	0.72	0.05, 3.08/0.49	Bear Fault: pyritic sheared tuff with a slice of chert within structure.
								230.10 to 230.22	0.12	0.48, 2.00/0.08	Footwall Fault: pyritic tuff on footwall side of "carbonate/chert" lens.
								231.74 to 240.14	8.40	0.24, 1.55/4.75	Foster's Fault: fault gouge, sheared epiclastic sediment and a thin lens of chert.
July 20	91-152	Bear South	23157.18 N 25253.18 E	1077.68	237.29°	-55.2°	0.00 to 274.02	226.70 to 229.39	2.69	0.05, 1.24/2.08	Bear Fault: sheared, pyritic chert and dolomite; 2 lost zones total 0.86m.
								237.48 to 237.67	0.19	0.14, 2.00/0.14	Footwall Fault: silicified brecciated dolomite with patchy fine sulphides.

* Represents core length, not true thickness.

TOTAL BEAR SOUTH SURFACE DRILLING = 2244.25m TOTAL 1991 DRILLING = 4976.76 m
SURFACE HOLES DRILLED IN BEAR SOUTH THIS YEAR = 8 TOTAL NUMBER OF HOLES = 22

Table 3.2.1 Golden Bear 1991 Bear South surface diamond drill hole summary.



1:5000

B91DH146 is approximately 95m south of this section at the Bear Fault.

See Figure 3.2.1 for location of A-A' cross-section.

Figure 3.2.4 Bear generalized cross-section at 23620N based on 1991 drilling and on surface geology.

Fault structure approximately 100m down dip from the Bear Main carbonate lens (see Fig.3.2.4). This second, deeper carbonate lens (intersected in all subsequent 1991 drill holes) is 7 to 30m in downhole width. The top of this second carbonate lens is traceable at approximately 1150m elevation (Fig.3.2.2) where it is exposed in outcrop on surface (Oliver,1990). The lens extends down dip at least to the 895m elevation. Minor anomalous grades within the lens grade up to 4.2 g/t Au and 31.0 g/t Ag over 0.75m in dolomite and interbedded chert.

The Footwall Fault was intersected in all drill holes. The fault varies from 0.14m (B91DH152) to 2.67m (B91DH149) and is commonly a carbonate breccia and pyritic mafic tuff or fault gouge. Weak expressions of the structure in these drill holes indicates that the Footwall Fault tends to lose its structural integrity at depth. Intersections in B91DH151 and B91DH152 indicate that the fault persists at least as far as the 870m elevation. No anomalous gold grades were reported for in the Footwall Fault.

The Internal Sliver Fault was intersected in B91DH145, B91DH147 and B91DH150 with widths of 0.65 to 1.27 meters. The Internal Sliver Fault appeared as gouge and pyritic chert breccia. Although no brecciated texture is evident, anomalous grade in B91DH149 of 3.1 g/t Au and 5.7 g/t Ag over 3.69m in dolomite occurs at the projected Internal Sliver Fault location.

Foster's Fault was intersected in 6 drill holes, varies in width from 2.49 to 7.68 meters and is expressed as fault gouge with associated carbonatized mafic volcanics, epiclastic sediments and minor carbonate. The structure was intersected as deep as 870m elevation. No anomalous grades were received for samples taken across Foster's Fault in the 1991 drilling.

A carbonate body was intersected in B90DH144 on the footwall side of Foster's Fault (Fig. 3.2.4). This carbonate body was drilled through in B91DH145, B91DH148 and B91DH149 proving a 5 to 8 m true thickness. The top of the Foster's Fault carbonate lens occurs at 1150m and is not intersected south of 23300N. Minor amounts of carbonate do appear in Foster's Fault breccia in most of the 1991 drill holes. No anomalous gold grades were returned from the Foster's Fault carbonate lens.

Stratigraphy surrounding the Ophir structures can be grouped into four general zones based on diamond drill hole interpretations. These are, from east to west: gabbro; mafic ash and lapilli tuffs; interbedded, locally carbonatized mafic epiclastic sediments and argillites; and strongly hematized and carbonatized mafic porphyritic flows and sediments. The distinctive hematized mafic flow unit is intersected on the west side of Foster's fault at 23550N and on the east side of Bear Fault at 23100N indicating that the Ophir structures crosscut this

stratigraphy. Andesitic and dioritic dykes are intersected on the east side of the Ophir Break. These dykes are believed to be steeply dipping, north striking intrusives.

Conclusions

The West Bear Fault (WBF), Razor Back Fault (RBF), Gully Fault and Splay Fault were channel sampled in 1991. Low anomalous assays were returned from both the RBF and Gully fault. Diamond drilling in the Bear South area tested the southern strike extent, as well as the dip extent of Ophir Break structures.

One anomalous sample of 2.1 g/t Au and 2.0 g/t Ag over 1.00m of fault gouge on the Razor Back Fault requires further investigation. More sampling is necessary at the north end of the RBF where carbonate outcrops near carbonatized mafic volcanic rocks.

The WBF is a normal fault extending south from the RBF and is exposed for approximately 100m strike length. Results from channel and chip sampling across this structure were not anomalous. However, carbonate outcrop was discovered in the creek bottom at 23470N between RBF and WBF. This contact should be investigated and sampled as it is currently mapped as carbonatized mafic rock.

The area bounded by the WBF and the RBF correlates directly with the structure, lithology and alteration seen in the Bear Fault system. The presence of a faulted, north-plunging antiform, strong silicification and brecciation within carbonates, and pervasive carbonate alteration are common to both zones. Although there is only one anomalous channel sample this area still carries potential for mineralization and warrants further investigation.

The Gully and Splay fault extend for 500m strike length cutting both mafic tuff and mafic volcanic flow rock. Channel and chip samples returned values up to 1.3 g/t Au and 0.2 g/t Ag over a minimum width of 0.50m. Extremely calcium carbonate altered rock occurs in the area of the Gully Fault between the old airport access road and the current airport access road. A second fault 25m west of the Gully Fault also occurs in the area of calcium carbonate alteration. The calcium carbonate alteration is of a different nature than the hydrothermal alteration associated with the Bear Fault but the structural intensity and 1991 assay values warrant a more detailed examination.

Drilling on the Bear South Grid extended the strike length of the Bear Fault 540m south of the 1360m portal and extended the dip extent of the Bear Fault to the 870m elevation.. A second carbonate lens was discovered 100m down dip from the Bear Main Zone carbonate lens in the Bear Fault structure. The top of this second

lens is at 1150m elevation and it is exposed in outcrop on surface at this elevation (Oliver, 1989). Mineralization in the area of the second carbonate lens is locally anomalous and becomes weaker to the south. The northernmost intersection in B91DH145 indicated the highest grade on this structure.

Oliver's (1990) mapping outlines a carbonate outcrop at 23300N and 1185m elevation. This outcrop should be investigated and channel sampled as it correlates to the top of this second carbonate lens. Delineation of this second carbonate lens through diamond drilling to the north between the 1050m and 1150m elevations (below the Bear Main Zone) is recommended (Fig. 3.2.2). The mineralizing fluids associated with the Bear Main Zone may have generated a second deeper zone in the structural and stratigraphic setting provided by this second carbonate lens.

Continuation of the drilling to the south is also recommended (Fig. 3.2.2). The structural model proposed by Lehrman and Caddey (1989) indicates that the repetition of cymoid loop structures along the Ophir Break is controlled by the interference of F_1 and F_2 folds as mapped by Oliver(1989). The proposed target of F_1 and F_2 fold intersections is coincident with outcrop of sheared fuchsitic, iron-carbonate altered tuff at 23050N. This has not yet been tested by drilling.

3.2.2 BEAR NORTH UNDERGROUND

Introduction

The Bear North area extends from approximately 24025N to approximately 24550N (Figs. 1.1.1 and 3.2.4). Bear North area overlaps onto the northern edge of the presently outlined Bear Main ore body and is south of the Troy Ridge area (section 3.2.3, this report). The Ophir Break strikes north across this zone and has been drifted along the 1400m level and drill tested from surface and underground. Bear North area was the focus for underground drilling in 1991 in an effort to define ore blocks and outline additional tonnages of ore to replace reserves mined during 1991.

Geology

Surface geology of the Bear North area consists of mafic volcanic, carbonate and gabbroic slide material, and talus masking outcrops of mafic volcanic rock, carbonatized volcanic rock and gabbro. Most of the geological information for this area is derived from 1400m level geology (Fig. 3.2.5) and from cross-sections (Fig. 3.2.6).

Bear North cross-sections typically show mafic volcanic rock becoming intensely carbonatized and silicified proximal to the Bear Fault (Fig. 3.2.6). The Bear Fault is comprised of pyritic sheared tuff and fault gouge. This fault brings mafic volcanics, in the hanging wall, in contact with a lens of silicified, locally brecciated and sulphide enriched dolomite and chert, in the footwall. A second fault zone, the Internal Sliver Fault, crosscuts the carbonate lens and consists of sheared, pyritic tuff, gouge and brecciated sulphide-enriched carbonate and silicic breccia. The footwall of the carbonate lens is marked by a third fault zone, the Footwall Fault, which consists of sheared, often pyritic tuff, fault gouge, and sometimes argillaceous sediments. The Footwall Fault is a contact between the carbonate lens, in the hanging wall, and variably sheared mafic volcanics, in the footwall, that are typically carbonatized, and may contain lenses of argillaceous sediments. Farther to the west, Foster's Fault zone consists of sheared, usually hematitic and sometimes carbonatized mafic volcanics, epiclastic sediments, and argillaceous sediments.

Relative reverse movement on the Internal Sliver Fault has resulted in a thickening or "doubling-up" of the carbonate lens. The Internal Sliver Fault bifurcates through this thickened zone forming two splays. One splay follows the west side of the hanging wall lens of carbonate (the Internal Sliver Hanging Wall Fault) and a second splay follows the east side of the footwall lens of

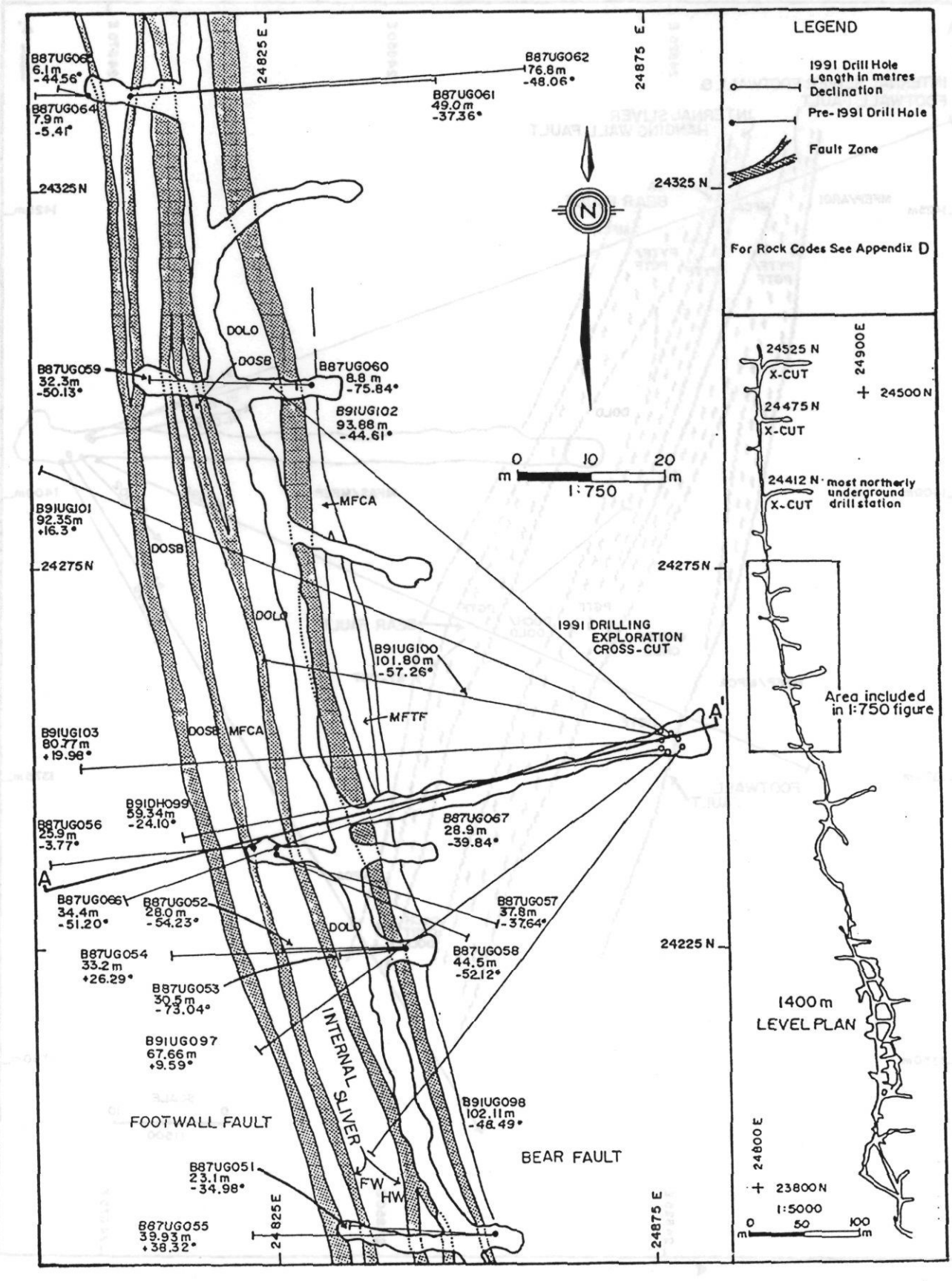


Figure 3.2.5 Bear North underground 1400m level plan showing 1991 drilling and local geology.

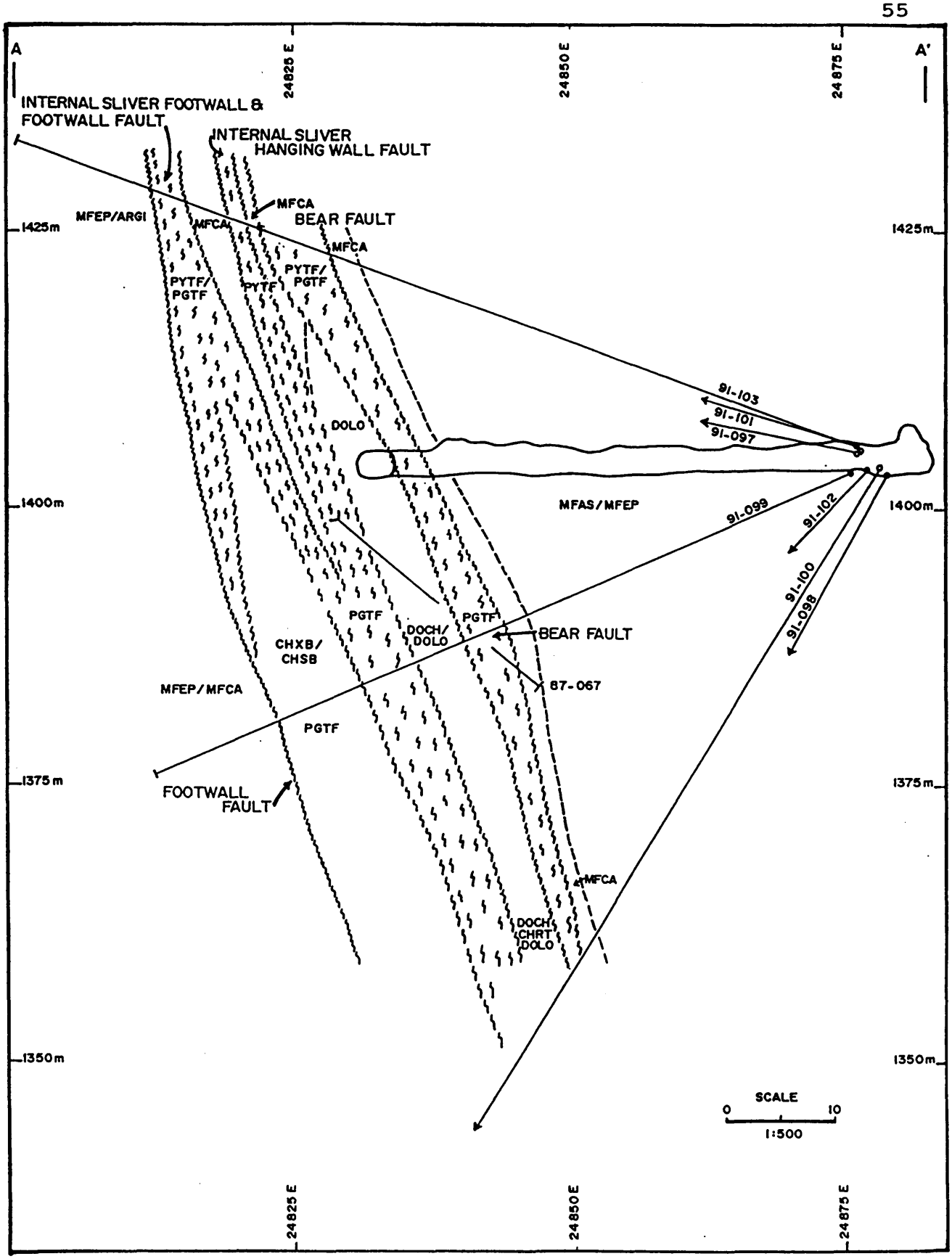


Figure 3.2.6 Bear North generalized cross-section based on drilling and underground geologic data.

carbonate (the Internal Sliver Footwall Fault; Fig. 3.2.6). As the carbonate lenses pinch out with increasing elevation, the Internal Sliver Hanging Wall and Internal Sliver Footwall Faults merge with the Bear Fault and the Footwall Fault respectively. The points of confluence of the faults, and the zone where the Internal Sliver bifurcates, represent areas of greater mineralized widths and often higher grades due to the increased dilatancy of the ore host structures.

A third slice of carbonate-chert may have been imbricated onto the others up to 1350m elevation on the east side of the Ophir Break at 24320N but further drill testing is required to determine the significance of this structure.

The morphology of the mineralized zones is consistent along the length of the Bear North area. On the 1400m level the Bear Fault thins out to a weakly mineralized fault zone north of 24100N where the east (or "hanging wall") carbonate lens pinches out leaving the Bear Fault cutting through carbonatized volcanics to 24185N where the carbonate lens thickens again. In this area, grade seems to be transferred to the Internal Sliver Zone which is the easternmost sheared volcanics/carbonate contact between 24100 and 24185N.

Another locally anomalous fault zone (up to 42 g/t Au over 0.60m in a 1990 test hole at 24125N), the Cub Fault, strikes north and lies 7m east of the Bear Fault. This zone has been intruded by a basalt dyke over most of its length.

Few drill holes have tested for the carbonate lenses or drilled through all of the mineralized zones below 1305m elevation in the Bear North area. A vertical hole (B87UG070) intersected the Footwall Fault at 1210m elevation on section 24420N and returned grades of up to 3.1 g/t Au, 6.2 g/t Ag over 1.52m. Several other anomalous grades up to 7.5 g/t Au, 9.6 g/t Ag over 0.32m and 15.1 g/t Au, 55.9 g/t Ag over 0.31m were returned for a pyritic, dolomite breccia just above the Footwall Fault. Numerous other anomalous grades were returned for samples from within the carbonate lens, above the Footwall Fault.

Previous Exploration

The Bear North area has received limited detailed surface exploration work due to the veneer of slide and talus material that covers much of the area. Mapping has identified few outcrops amongst the overburden. A geochemical grid over the area shows the general trend of the Ophir Break with gold values up to 550 ppb Au. A VLF-EM geophysical survey over the same area shows an anomaly over the Bear Main zone but it becomes much weaker in areas of thick overburden.

Drilling in this area from 1983 to 1985 consisted of 29 surface diamond drill holes as CML tracked the Bear Main Fault and parallel structures northwards. Four more surface holes were drilled by NAMC in 1986. Underground development work in 1987 extended the 1400m level as far north as 24530N while underground drilling of 33 holes in the Bear North area tested the main structures as far north as 24415N. Cross-cuts suitable for drill stations exist at 24475N and 24525N.

In 1990, compilation work, re-logging of previously drilled core, and section interpretation preceded the surface and underground drill programs. The surface drill program consisted of 7 holes which targeted the main structures from 24080N to 24180N. The underground drill program consisted of 9 holes that were drilled from a single station at the end of a 40m cross-cut at 24150N. The underground drill holes intersected the main structures from 24060N to 24180N.

Re-logging and re-interpretation through sections 24250N to 24480N was completed late in the 1990 field season in order to delineate targets for further exploration drilling in 1991.

1991 Activities and Results

Drill testing across at least half the strike length of the main fault structures between the Bear Main Zone and the current end of development was recommended at the conclusion of Bear North underground drilling last year. In 1991, the Bear North area was further tested by underground drilling. The 1991 drill program included 7 drill holes (totalling 607.91m) designed to intersect the Bear Fault, the Internal Sliver structure(s) and the Footwall Fault from 24220N to 24280N, north of, and along strike from the Bear Main Zone. The 7 holes were drilled from a single station at the end of a 50m cross-cut (developed during June and July) at 24250N (Fig. 3.2.5 and 3.2.6). Summaries of each drill hole are listed in Appendix B and assay results for all structures are listed by drill hole in Table 3.2.2.

Lost core or poor recovery is often associated with the fault zones due to the soft and incompetent nature of the fine grained fault gouge and pyritic tuff that comprises the zones of interest.

All drill holes were drilled from east to west and intersected mafic flow, and mafic pyroclastic rocks with minor interbedded argillite and epiclastic sediments in the hanging wall to the Bear Fault.

One drill hole (B91UG102) intersected pyritic gouge in the hanging wall to the Bear Fault. The gouge assayed 1.89 g/t Au, 20.18 g/t Ag over 0.39m and probably represents the Cub Fault. The Cub Fault strikes north and lies 7m east of the Bear Fault. This

GOLDEN BEAR OPERATING COMPANY LTD.
DIAMOND DRILL HOLE SUMMARY FOR 1991 BEAR NORTH UNDERGROUND DRILLING

CONTRACTOR: P. Boisvenu Drilling RIG: Connors Drill

DATE	HOLE #	AREA	LOCATION	ELEVATION (m)	AZIMUTH	DIP	LENGTH (m)	INTERSECTION (m)	WIDTH (m)	GRADE/TRUE WIDTH (gms Au/t,gms Ag/t/mtt)	REMARKS
August 15	91-97	Bear North	24250.36 N 24877.07 E	1405.03	234.75°	+ 9.8°	0.00 to 67.66	49.60 to 49.96	0.36	2.67, 5.60 / 0.29	Bear Fault: pyritic gouge at contact of carbonatized volcanics and dolomite.
								52.22 to 55.27	3.05	6.03, 1.89 / 2.77	Internal Sliver Hanging Wall Fault: pyritic gouge, sheared tuff and carbonatized volcanics.
								(53.85 to 55.60	1.75	9.30, 1.40 / 1.59	ISHW 7g grades: gouge and 1 lost zone of 0.29m.)
								(52.00 to 57.60	5.60	6.08, 1.88 / 5.09	ISHW 3g grades: dolomite, pyritic gouge, tuff, carbonatized volcanics and 1 lost of 0.29m.)
								65.87 to 67.66	1.79	1.94,21.78 / 1.55	Internal Sliver Footwall Fault: pyritic gouge and chert with 2 lost zones totalling 0.88m.
August 21	91-98	Bear North	24251.39 N 24879.38 E	1403.62	218.46°	-48.4°	0.00 to 102.11	51.12 to 53.48	2.36	0.73, 1.17 / 1.65	Bear Fault: Gouge and 2 lost zones totalling 1.61m at contact of argillite and dolomite.
								53.48 to 54.37	0.97	4.80, 2.60 / 0.68	Silicified, brecciated dolomite following the Bear Fault.
								54.37 to 56.25	1.88	0.14, 0.85 / 1.41	Internal Sliver Hanging Wall Fault: pyritic sheared tuff and 3 lost zones totalling 0.89m.
								58.39 to 61.75	3.36	3.96, 4.55 / 2.43	Internal Sliver Footwall Fault: chert breccia, pyritic gouge and 1 lost zone of 0.17m.
								(60.18 to 61.18	1.00	8.95, 8.00 / 0.72	ISFW 7g grade; pyritic silicified chert breccia within the ISFW Fault structure.)
								74.60 to 75.40	0.80	1.63, 3.58 / 0.80*	Dolomite and chert, silicified, pyritic; within carbonate lens.
								77.30 to 79.92	2.62	2.24,23.92 / 2.62*	Dolomite and chert, silicified, pyritic; within carbonate lens.
								(74.60 to 92.33	17.73	5.63,11.38 /10.67	Continuous elevated grade extends over this interval; dolomite, chert, pyritic gouge, and 4 lost zones totalling 1.56m.)
								90.63 to 95.71	5.08	6.86,11.76 / 3.06	Footwall Fault: pyritic gouge, pyritic sheared tuff, gouge, chert and 1 lost of 0.78m.
								(88.73 to 91.79	3.06	20.49,21.39 / 1.84	FW 7g grade; partly precedes the Footwall Fault; dolomite, pyritic dolomite breccia, pyritic gouge and pyritic sheared tuff.)
August 25	91-99	Bear North	24251.11 N 24876.40 E	1403.87	260.20°	-22.9°	0.00 to 69.34	37.55 to 40.54	2.99	2.02, 3.59 / 2.97	Bear Fault: pyritic gouge, silicified chert breccia and 1 lost zone of 0.52m.
								(39.19 to 58.52	19.33	4.31, 2.67 /18.96	Elevated grade extends from Bear Fault to Footwall Fault.)
								45.45 to 50.60	5.15	7.03, 1.96 / 5.05	Internal Sliver Fault: pyritic gouge, dolomite, and pyritic chert breccia (below confluence of the ISHW and ISFW Faults).
								(45.45 to 47.95	2.50	10.77, 1.54 / 2.45	IS Fault 7g grade; pyritic gouge.)
								(49.80 to 50.60	0.80	7.93, 5.53 / 0.78	IS Fault 7g grade; pyritic gouge.)
								53.11 to 58.23	5.12	-	Lost 5.12m; HQ to BQ size reduction; possibly a karst cavity.
								58.45 to 58.52	0.07	10.29, 9.0 / 0.07	Footwall Fault: pyritic gouge at the footwall contact of chert with epiclastic sediments.
August 28	91-100	Bear North	24252.54 N 24878.53 E	1403.68	281.10°	-57.4°	0.00 to 101.80	53.33 to 54.35	1.02	1.05, 2.22 / 0.76	Bear Fault: pyritic gouge with grades up to 5.01,0.66/0.12.
								67.32 to 68.77	1.45	0.31, 1.2 / 1.04	Internal Sliver?: silicified brecciated chert within carbonate lens.
								78.48 to 80.44	1.96	1.05, 5.90 / 1.37	Internal Sliver?: silicified brecciated dolomite within carbonate lens.
								83.34 to 86.40	3.06	1.39, 5.90 / 1.94	Footwall Fault: silicified dolomite and pyritic gouge with grades up to 4.80,13.0/0.45.
August 31	91-101	Bear North	24253.68 N 24876.72 E	1405.53	293.59°	+15.8°	0.00 to 92.35	66.45 to 72.39	5.94	7.57, 4.11 / 4.46	Bear Fault & ISHW Fault: pyritic tuff, gouge & chert breccia: 4 lost zones totalling 1.29m.
								(68.61 to 72.39	3.48	11.17, 4.18 / 2.61	Bear Fault & ISHW 7g grade: latter half of fault zone contains higher grade pyritic gouge.)
								78.93 to 80.60	1.67	7.00, 4.59 / 1.25	ISFW Fault & Footwall Fault: pyritic chert breccia, tuff and fault gouge.
								(78.93 to 79.35	0.42	20.13, 7.40 / 0.31	ISFW Fault & Footwall Fault 7g grade: pyritic chert breccia.)
Sept. 4	91-102	Bear North	24253.88 N 24877.78 E	1403.47	312.67°	+38.7°	0.00 to 93.88	36.61 to 37.25	0.64	1.89,20.18 / 0.39	Cub Fault: pyritic tuff and carbonatized volcanics; grade up to 4.97, 5.6/0.12*.
								56.97 to 61.93	4.96	0.93, 8.11 / 3.13	Bear Fault: pyritic tuff and fault gouge.
								62.31 to 63.31	1.00	6.38, 3.8 / 1.00*	Grade within dolomite on the footwall side of the Bear Fault.
								80.80 to 82.45	1.65	2.86, 5.64 / 0.86	Internal Sliver Fault: sulphide-rich brecciated chert within silicified dolomite.
								88.08 to 90.20	2.14	3.54, 5.13 / 0.64	Footwall Fault: pyritic gouge and carbonatized volcanics; grade up to 9.19, 10.4/0.76*.
Sept. 7	91-103	Bear North	24252.57 N 24876.66 E	1405.77	267.78°	-18.7°	0.00 to 80.77	53.50 to 59.70	6.20	6.56, 6.03 / 4.51	Bear Fault: pyritic tuff and 1 lost zone of 1.33m.
								(56.00 to 57.36	1.36	14.61, 6.59 / 0.99	Bear Fault 7g grade: higher grade portion of pyritic tuff.)
								60.26 to 62.48	2.22	2.85, 4.59 / 1.61	Internal Sliver Hanging Wall Fault: pyritic sheared tuff.
								66.34 to 70.32	3.98	4.93, 5.18 / 3.30	ISFW Fault & Footwall Fault: pyritic gouge.
								(67.15 to 68.02	0.87	8.43, 5.8 / 0.72	ISFW Fault & Footwall Fault 7g grade: higher grade portion of pyritic gouge.)
								(53.50 to 70.32	16.82	4.64, 4.59 /12.81	Elevated grade extends from Bear Fault to the Footwall Fault.)

* Represents core length, not true thickness.

TOTAL BEAR NORTH UNDERGROUND DRILLING = 607.91m TOTAL 1991 DRILLING = 4976.76m
TOTAL NUMBER OF UNDERGROUND HOLES = 7 TOTAL NUMBER OF 1991 HOLES = 22

Table 3.2.2 Golden Bear 1991 Bear North underground diamond drill hole summary.

zone has been intruded by a basalt dyke over most of its length.

In all drill holes, volcanic rock is carbonatized with an increasing intensity of alteration closer to the Bear Fault. The Bear Fault structure is typically expressed as pyritic tuff and/or pyritic gouge at the contact of the altered volcanic rocks and the silicified brecciated dolomite. In holes B91UG098, B91UG101 and B91UG102 silicified chert breccia is also described as part of the Bear structure.

The highest results received for the Bear structure were for pyritic tuff, gouge and chert breccia (the Bear Fault and Internal Sliver Fault combined) in B91UG101 that graded 7.57 g/t Au, 4.11 g/t Ag over 4.46m and for pyritic tuff (Bear Fault only) in B91UG103 that graded 6.56 g/t Au, 6.03g/t Ag over 4.51m. Both these zones include portions of higher grade material. Composite grades have been calculated for the high grade portions of these intersections and are tabulated in Table 3.2.2. All other intersections of the Bear structure returned less than 3 g/t Au assay results (Fig. 3.2.7).

Holes B91UG098, B91UG100, and B91UG102 intersected the carbonate lenses between 1325m and 1365m elevation. All three drill holes intersected the Internal Sliver Fault below the point where this structure bifurcates into the Internal Sliver Hanging Wall Fault and the Internal Sliver Footwall Fault. The Internal Sliver Fault is described as pyritic gouge, silicified chert breccia, and as silicified and brecciated dolomite.

The highest grade received for this structure was 7.03 g/t Au, 1.96 g/t Ag over 5.05m in B91UG099. This zone contains two smaller high grade intervals which are also reported separately, as composite grades, in Table 3.2.2 The assay results for Internal Sliver Intersections in B91UG100 and B91UG102 were less than 3 g/t Au (Fig.3.2.7).

Holes B91UG097, B91UG099, and B91UG103 were drilled through the top of the carbonate lenses between 1380m and 1430m elevation targeting the four main structures; the Bear, the Internal Sliver Hanging Wall, the Internal Sliver Footwall, and the Footwall Faults. Both B91UG098 and B91UG103 were completed but, B91UG097 was abandoned in the western carbonate lens, before intersecting the Footwall Fault and reaching the target depth.

The Internal Sliver Hanging Wall Fault separates the eastern carbonate lens in the hanging wall from gouge and carbonatized mafic volcanics in the footwall of the structure. The fault is described as pyritic gouge, pyritic tuff and sheared tuff and yields composite grades of up to 6.03 g/t Au, 1.89 g/t Ag over 2.77m in B91UG097 (Fig. 3.2.7).

The Internal Sliver Footwall Fault places gouge and

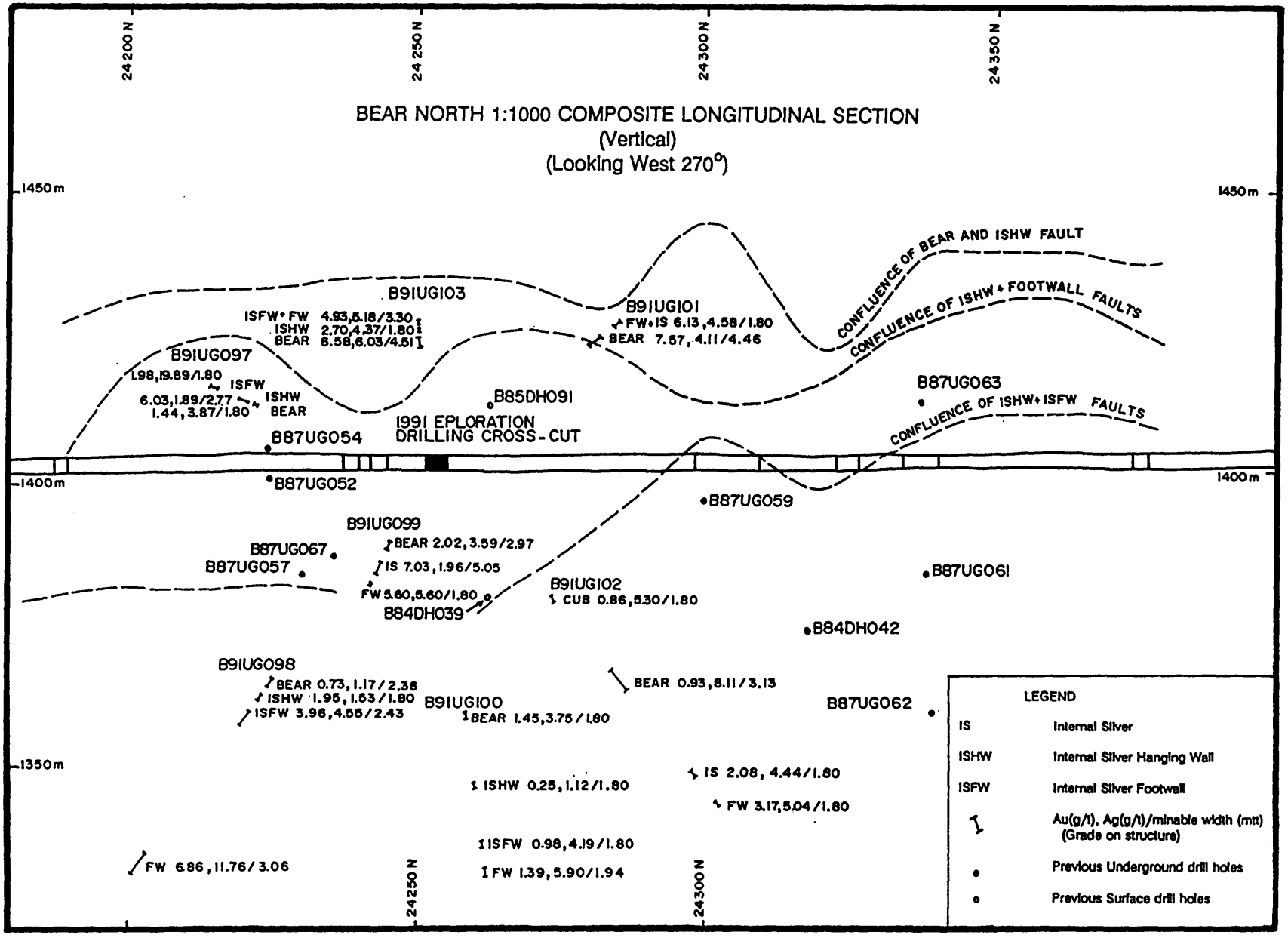


Figure 3.2.7 Bear North area composite longitudinal section showing locations of 1991 intersections on all structures.

carbonatized mafic volcanic rocks in the hanging wall against the chert and dolomite in the footwall. This structure yields composite grades of up to 4.93 g/t Au, 5.18 g/t Ag over 3.30m in B91UG103 where it has merged with the Footwall Fault, and 3.96 g/t Au, 4.55 g/t Ag over 2.43m in B91UG098 (Fig. 3.2.7) where it occurs as a chert breccia and pyritic gouge zone.

The Footwall Fault was intersected as a single structure in holes B91UG098, B91UG099, B91UG100, and B91UG102. This structure is typically described as pyritic gouge, non-pyritic gouge and sheared, carbonatized mafic tuff. In hole B91UG100, silicified dolomite breccia is also incorporated into the structure. Composite grades of up to 10.29 g/t Au, 9.0 g/t Ag over 0.07m and 6.86 g/t Au, 11.76 g/t Ag over 3.06m were reported for the Footwall Fault structure in holes B91UG099 and B91UG098 respectively (Fig. 3.2.7). A high grade portion of the Footwall Fault intersection in drill hole B91UG098 assayed 20.49 g/t Au, 21.39 g/t Ag over 1.84m.

B91UG101 intersected the main structures above the structural confluence of the Bear Fault and the Internal Sliver Hanging Wall and above the structural confluence of the Footwall Fault and the Internal Sliver Footwall. These combined structures yielded relatively high grades of 7.57 g/t Au, 4.11 g/t Ag over 4.46m (as quoted previously) and 7.00 g/t Au, 4.59 g/t Ag over 1.25m respectively (Fig. 3.2.7).

Carbonatized mafic volcanic rocks and mafic epiclastic rocks as well as argillite and minor argillaceous chert occur in the footwall of the Footwall Fault. Carbonatization of the sheared mafic volcanic rocks and epiclastic sediments decreased west of the Footwall Fault.

None of the 1991 underground drill holes penetrated Foster's Fault, although B91UG101 ends within gouge of the Foster's Fault structure.

Conclusions

The 1991 drill program was designed to delineate and build additional reserves through the Bear North area. Results did not provide any significant additions to the Mineral Inventory, however, potential for additional resources in this area still exists.

In the northern part of the Bear North area there are several wide-spaced intersections on at least 3 parallel structures (the Bear Fault, the Internal Sliver Fault, and the Footwall Fault). Each structure requires further definition to outline potential resources and establish dip extent.

The northern 100m of the 1400m level has received no underground drilling to date. The 1400m level has an exploration drift along its entire length which would facilitate underground drilling with little further underground development.

Recommendations for the Bear North area include a continuation of underground drilling designed to continue to test the strike length of the main fault structures from 24250N to the current end of development at 24535N. The structures could be tested in a minimum fashion with 40 to 50m spacing between holes. Drilling could be accomplished using existing cross-cuts at 24250N and at 24410N and by establishment of a new 40m cross-cut at the end of the existing workings. Rehabilitation on the 1400m level would also be required north of 24250N.

As open pit mining is expected to continue down through the 1360m level in 1991, there is a certain urgency to completion of this work. Underground drilling in the Bear North area cannot take place while the open pit is in operation. Access to the 1360m and 1400m levels will be destroyed during the 1991 mining season.

An underground drill program in the Bear North area must be completed before May, 1991 if costly rehabilitation is to be avoided. Underground drilling in this area after the 1991 mining season will require reestablishment of the 1360m and/or 1400m level portals as well as rehabilitation of the underground workings.

3.2.3 TROY RIDGE

Introduction

Troy Ridge is located in the north central part of the BEAR claim (Fig. 3.1.1). The locality is named for the ridge of dark gabbroic rock that outcrops along the top of East Bowl. Troy Ridge includes the area from Bear North (north of 24540N) to Helen Lake. It is bounded to the west by the West Wall Fault and to the east by lateral glacial moraine material from Helen Glacier.

Geology

Troy Ridge is characterized by a dark prominent ridge formed by a massive, shallowly dipping porphyritic gabbro and microgabbro sill. The gabbro outcrops along the north side of East Bowl. On the west end of the ridge, carbonate and mafic volcanic rocks of the Stikine Terrane Assemblage are exposed in a series of north-trending anticlinal and synclinal structures (Fig. 3.2.8).

Massive, thick bedded limestone forms the base of the stratigraphy in the area. Locally, banded and crinoidal limestone has been mapped between this limestone unit and an overlying dolomite with chert interbeds. The carbonates are capped by mafic pyroclastic and flow rocks that are locally iron carbonate altered, particularly adjacent to large scale fault structures.

Steep east-dipping faults; the Bear Fault, the Footwall Fault, and the West Wall Fault, cut the stratigraphy and roughly parallel the fold axes.

The Bear Fault encloses a lens of dolomite and chert. Early mapping by Chevron Minerals Ltd. (1985) indicated that the Bear Fault formed the eastern structural boundary to the carbonate lens and that a splay off the Bear Fault formed the western bounding fault (the Footwall Fault). Oliver (1989) also mapped a fault-bounded carbonate lens, but did not indicate that the bounding faults merge at surface.

The easternmost structure (Bear Fault) juxtaposes carbonatized mafic volcanic rocks on the hanging wall against dolomite in the footwall. The western structure (Footwall Fault) places carbonate in the hanging wall against the volcanic and carbonate rock package in the footwall.

West of these structures, mafic lapilli tuff, mafic tuff and dolomite with interbedded chert are exposed in the trough of a synformal structure. On surface, a zone of extremely carbonate altered mafic volcanic rock cut by sheeted ankerite-dolomite veins occurs west of the exposed carbonate lens (Fig. 3.2.9). This zone of alteration in the volcanic rocks is similar to alteration seen

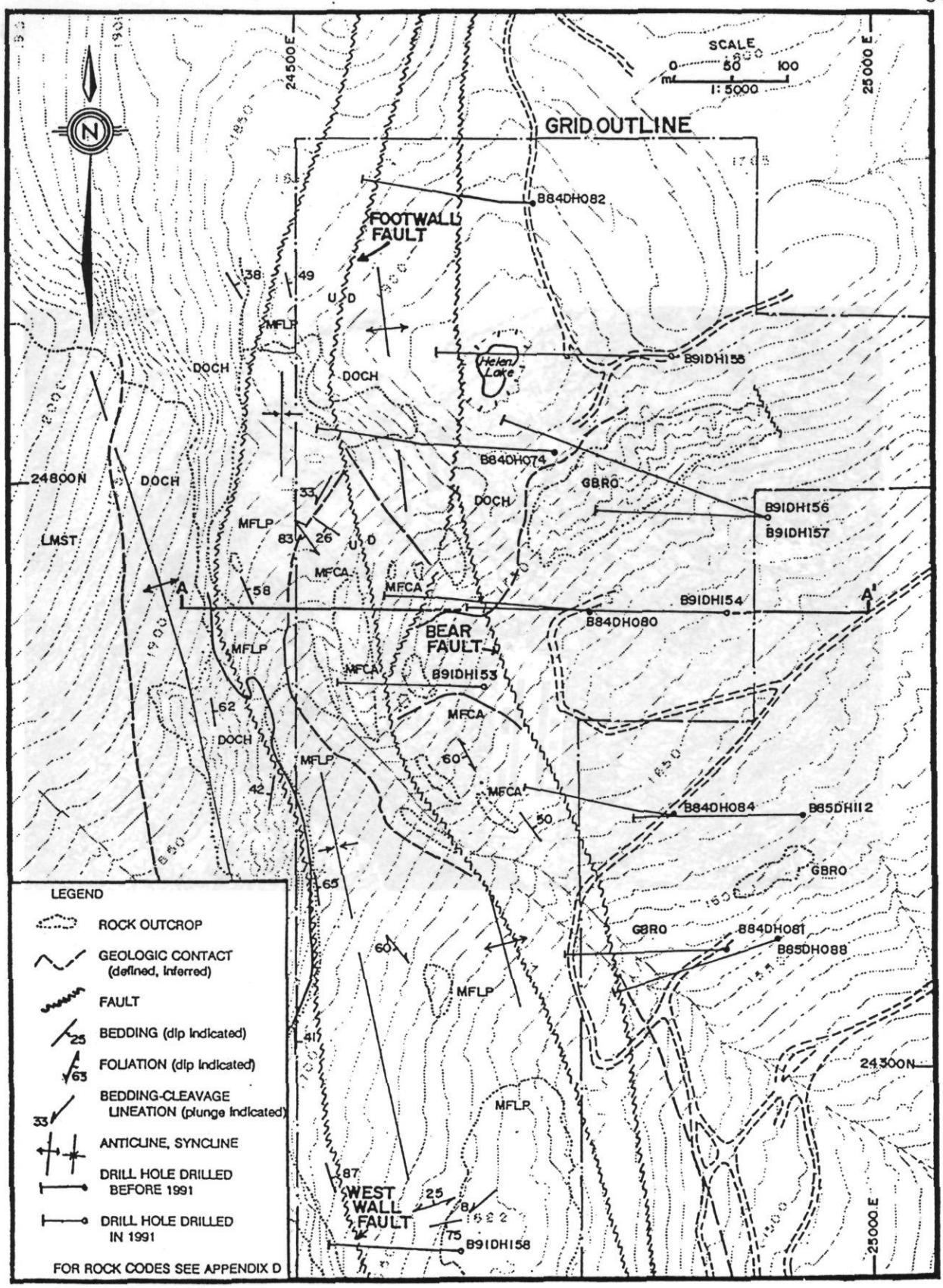


Figure 3.2.8 Geology map of the Troy Ridge area summarizing 1991 work.

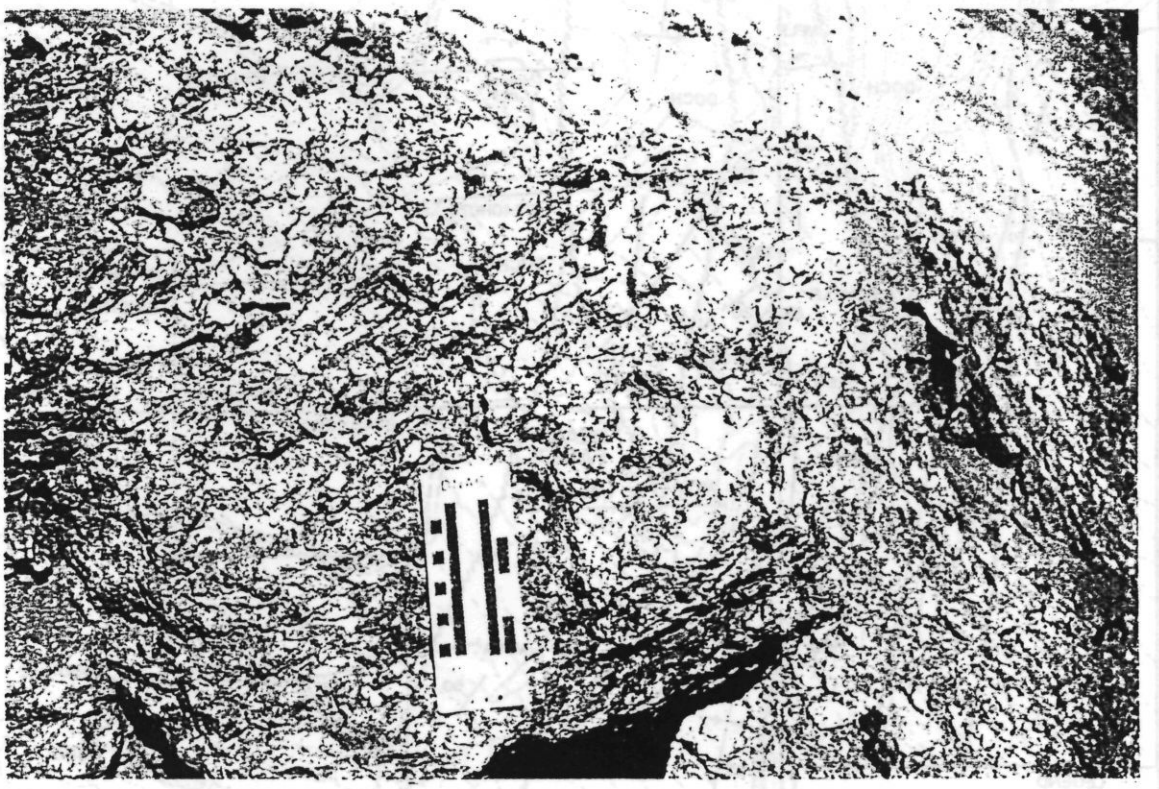


Figure 3.2.9 Photograph of extremely carbonatized and ankeritic mafic volcanic rock from the Troy Ridge area.

in the Bear Main Zone.

The north-trending West Wall Fault dips at 65° to the east and marks the western extent of the Troy Ridge area. The West Wall Fault separates a massive section of western carbonate units from mafic volcanic rocks in the Ophir Break to the east. This fault approximately coincides with an antiformal fold axis and cuts dolomite with interbedded chert exposed in the crest of the fold.

The crest of Troy Ridge is capped by lateral moraine material that originated from Helen Glacier and has spilled over Troy Ridge into East Bowl.

Previous Exploration

Previous work on Troy Ridge includes geochemistry, geophysics, regional mapping, and limited diamond drilling. The area of underground workings continues as far north as 24530N, but no underground work has been done in the Troy Ridge area.

Silt and soil geochemistry was carried out in 1981 and 1982 over the Troy Ridge area. Results indicate anomalous values in Au (up to 600 ppb), As (>1000 ppm), and Sb (up to 39 ppm), that form a broad, moderate to strong anomaly east of the Bear Main Fault and west of East Bowl Creek. Geochemical results for silver were not notably anomalous across the area.

A VLF (EM-16) survey was conducted on the property in 1985. Results indicated a weak high across the Troy Ridge area. The north-trending narrow high is coincident with the Bear Main structure and the carbonate lens. Survey results on the top of the ridge are masked by Helen Glacier moraine material. North of Helen Lake, beyond the moraine material, the anomaly resumes and continues in a linear trend north to Fleece Bowl.

Geologic mapping in the area has been on a regional scale. Chevron Minerals Ltd. completed a property scale map at 1:5000 during 1984 and 1985. More recent work has been done at the same scale by Oliver (1989).

In 1984, Chevron Minerals Ltd. drilled three holes (B84DH074, B84DH080, B84DH084) on Troy Ridge to test for carbonate outliers and fault structures up to and including the West Wall fault. All drill holes intersected the Bear Main structure and two of the holes intersected the West Wall fault.

In 1985, NAMC completed one drill hole (B85DH112) collared east of B84DH084 on section 24525N.

All four drill holes intersected tuff with local siltstone interbeds and lesser gabbro in the hanging wall of the Bear Main Zone.

The Bear Main structure was expressed as a zone of bleached, brecciated and sheared pyritic tuff with minor gouge in each of the four drill holes; and also by silicified polylithic breccia which includes carbonate rock fragments in holes B84DH080, B84DH084, B85DH112 and B84DH074.

Weak anomalous grade was reported across the Bear Main structure in all drill holes. Grades peaked at 1.4 g/t Au, 3.9 g/t Ag over 2.18m for hanging wall altered tuff in B84DH084 which intersected the Bear Main structure at 1550m elevation. Similar assays were also reported for B85DH112 which intersected the Bear Main structure at 1412m elevation and produced consecutive results of 1.4 g/t Au, 1.0 g/t Ag over 1.05m and 1.2 g/t Au, 0.8 g/t Ag over 1.0m for hanging wall pyritic tuff.

Below the Bear Main structure weakly bleached, lapilli-poor tuffs with minor black, cherty, carbonaceous, pyritic siltstones were intersected in all three Chevron drill holes.

In B85DH112 a 38.35m interval of silicified, brecciated dolomite and strongly brecciated jasperoid was intersected below the Bear Main structure between 1412m and 1372m elevation. A 2.1m interval of silicified carbonate breccia marks the lower contact of the carbonate lens and has been interpreted as the Footwall Fault (the west bounding structure).

Consecutive samples in silicified and brecciated jasperoid yielded assays of 6.6 g/t Au, 2.8 g/t Ag over 1.0m and 8.1 g/t Au, 5.3 g/t Ag over 1.0m. The silicified carbonate breccia also yielded anomalous results of 2.3 g/t Au, 2.3 g/t Ag over 1.05m and 2.8 g/t Au, 6.3 g/t Ag over 1.05m for consecutive samples.

The West Wall fault is expressed by a narrow gouge zone in holes B84DH074 and B84DH080. Grades of 0.1 g/t Au, 0.4 g/t Ag over 0.95m and 0.7 g/t Au, 0.3 g/t Ag over 0.37m were reported across this zone in B84DH074 and B84DH080 respectively. In both of these holes, partially silicified, brecciated and locally dolomitized limestone was intersected in the footwall below the West Wall fault. Holes B85DH112 and B84DH084 did not penetrate the West Wall Fault. These holes ended in altered tuffaceous rocks just below the Footwall Fault.

In 1990, little work was carried out in the Troy Ridge area. Five soil samples and two rock chip samples were collected. The samples were taken in an area of extremely carbonate altered mafic volcanic rock cut by sheeted ankerite-dolomite veins (Fig. 3.2.9). This area is located between two fault zones in the Ophir Break.

1991 Activities and Results

In 1991 a grid was established over Troy Ridge in June to

provide control for the detailed 1:1000 scale mapping, sampling and drilling. Grid soil sampling was not conducted as previous soil sampling of the Troy Ridge area provided satisfactory coverage.

Mapping at 1:1000 scale was carried out in June and July. Work indicated that the Bear Fault defines the eastern boundary of the large carbonate outcrop at 24750N, 24600E. Extremely altered fuchsitic mafic volcanic rock outcrops to the west of the carbonate. The contact between these rock types is not exposed, but it is considered to be a fault contact equivalent to the Footwall Fault. Previous drilling (B84DH080) on line 24700N did not intersect carbonate rock 150 meters below the outcrop exposure indicating that this carbonate lens pinches out at a shallow depth (Fig. 3.2.10).

A second, previously unmapped carbonate lens occurs along a structure (Foster's Fault ?) at 24600N, 24580E. Dolomite with interbedded chert is exposed across a two meter width within a north trending structure that is central to the 50m wide zone of carbonate altered mafic volcanic rock. B91DH153 intersected this structure at the 1650 meter level (150 meters below surface) but no carbonate lens was intersected, therefore this exposure of carbonate also pinches out at a relatively shallow depth.

Mapping also further defined the position of the steep to moderately east dipping West Wall Fault which places hanging wall volcanic rock against the carbonate rock that is exposed on the steep scarp slopes along the western edge of the Troy Ridge Grid.

The 50m wide zone of highly altered mafic volcanic rock has been the focus of the sampling in the Troy Ridge area (Fig.3.2.9). A total of 119 samples were taken with grades up to 0.50 g/t Au, 1.80 g/t Ag in a grab sample for carbonate altered mafic volcanic rock and 0.93 g/t Au, 1.2 g/t Ag over 0.15m in a limonitic shear within the carbonate altered mafic volcanic rock.

The highest assay received was 1.06 g/t Au, 1.20 g/t Ag over 0.15m for gouge sampled in a north trending graphitic shear zone at 24290N, 24680E. The relationship of this structure to the other known structures is not fully understood, however, the shear is on strike with, and may be related to (or part of) Foster's Fault.

One hundred and nineteen chip and grab samples were taken at several locations on the West Wall Fault. Assay values up to 0.48 g/t Au, 2.6 g/t Ag over 1.00m in dolomite with minor chert and 0.41 g/t Au, 3.4 g/t Ag grab sample in carbonate altered mafic volcanic rock.

Four drill targets were tested on Troy Ridge this summer: the Bear Fault at 1400m elevation, the Footwall Fault at 1375m elevation, the eastern strike deflection of the Footwall Fault, and the West Wall Fault above 1600m elevation. Six drill holes

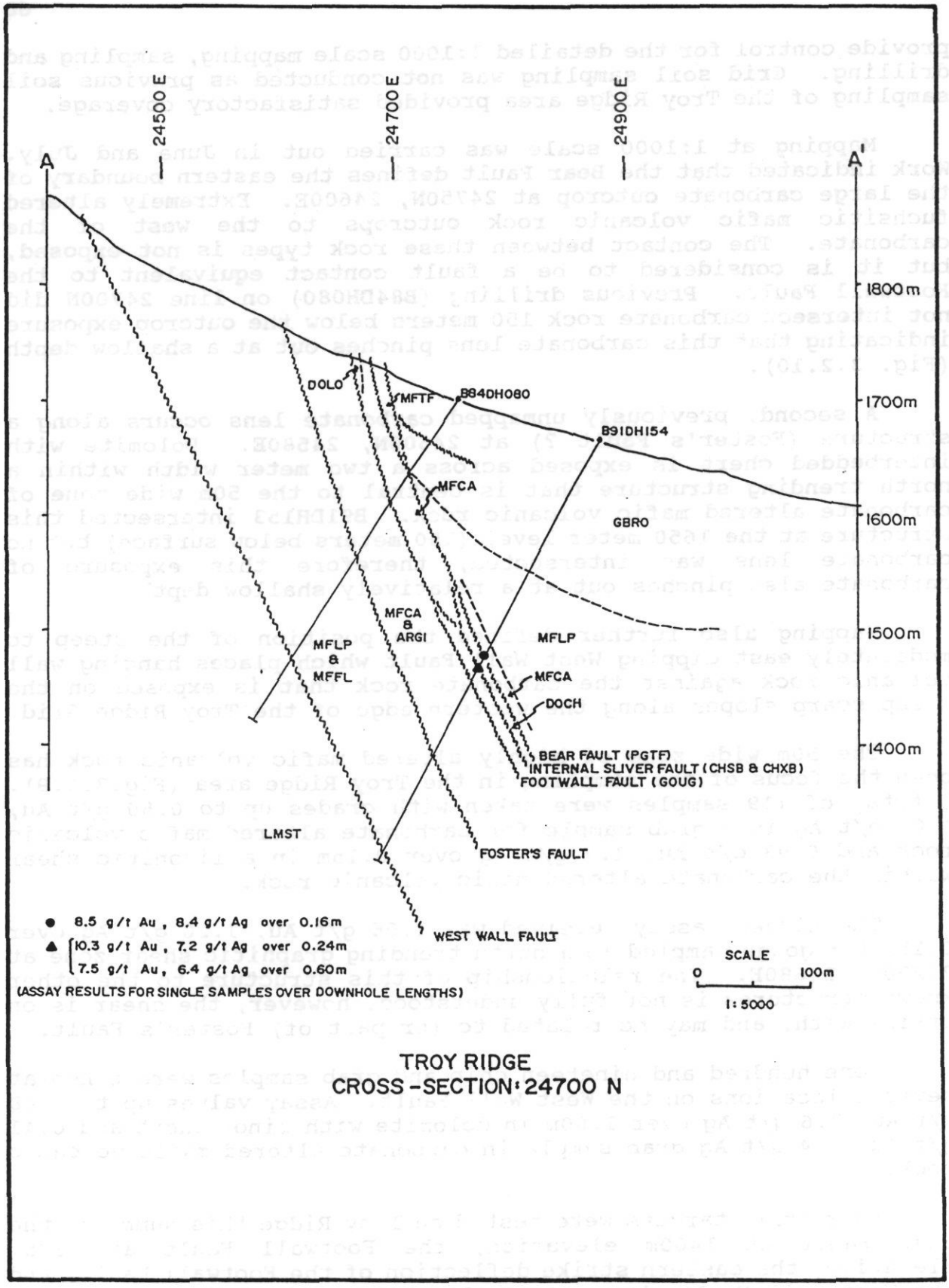


Figure 3.2.10 Troy Ridge cross-section A-A' drawn parallel to drill hole B91DH154 (B84DH080 is off-section).

totalling 2124.6m were completed and 883 samples of drill core were assayed for gold and silver.

The Bear Main structure was intersected at 1480m, 1615m, 1454m, and 1422m elevation in holes B91DH154, B91DH155, B91DH156, and B91DH157 respectively (Fig. 3.2.11). In drill hole B91DH154, samples taken on the Bear Fault assayed 1.71 g/t Au, 2.71 g/t Ag over 1.24m in pyritic tuff and pyritic gouge with a local grade of 8.5 g/t Au, 8.4 g/t Ag over 0.16m in pyritic gouge (Fig. 3.2.10). Low composite grades (less than 1 g/t Au and less than 2 g/t Ag) were reported for the Bear Fault in the remaining three drill holes.

The Internal Sliver Fault structure was intersected in B91DH154, B91DH155 and B91DH156. The highest grade reported for this structure was in B91DH154 where pyritic gouge, sheared tuff and pyritic brecciated chert graded 5.61 g/t Au, 6.13 g/t Ag over 0.73m with a local grade of 8.33 g/t Au, 6.63 g/t Ag over 0.43m. Other Internal Sliver Fault intersections are reported in Table 3.3.3.

The Footwall Fault was intersected at 1467m, 1611m, 1423m and 1377m elevation in holes B91DH154, B91DH155, B91DH156 and B91DH157 respectively. Results were typically low (see Table 3.3.3). The highest grades returned were from the deepest intersections; 1.60 g/t Au, 5.01 g/t Ag over 2.21 m in carbonatized mafic volcanics, cherty dolomite and pyritic gouge (B91DH156), and 1.37 g/t Au, 2.22 g/t Ag over 7.57m (core length) in carbonatized mafic volcanic gouge, pyritic tuff and pyritic gouge (B91DH157).

Hole B91DH155 was drilled on Troy Ridge to test the eastern strike deflection of the Footwall Fault between Helen Lake and 25050N. The Footwall Fault together with the Internal Sliver Fault was intersected at 1611m in this hole and returned low grades of 0.37 g/t Au, 1.07 g/t Ag over 5.88m. The relatively extensive fault zone in this drill hole has been attributed to a convergence of the Footwall Fault and the Internal Sliver Fault. However, this wider zone of shearing may be evidence of dilation along the eastern strike deflection of the Footwall Fault in this location. In any case, assay results are not encouraging.

Foster's Fault was intersected in holes B91DH153, B91DH155 and B91DH156. Grades are typically low for samples taken on this structure. The highest grade was reported in drill hole B91DH156 where pyritic gouge within altered and sheared volcanics assayed 2.98 g/t Au, 2.00 g/t Ag over 0.26m. This fault is not continuous between sections and locally appears to merge with the Footwall Fault.

The West Wall Fault was intersected at 1516m, 1324m, 1465m, 1275m and 1527m by drill holes B91DH153, B91DH154, B91DH155, B91DH156 and B91DH158 respectively. Sheared argillite in the

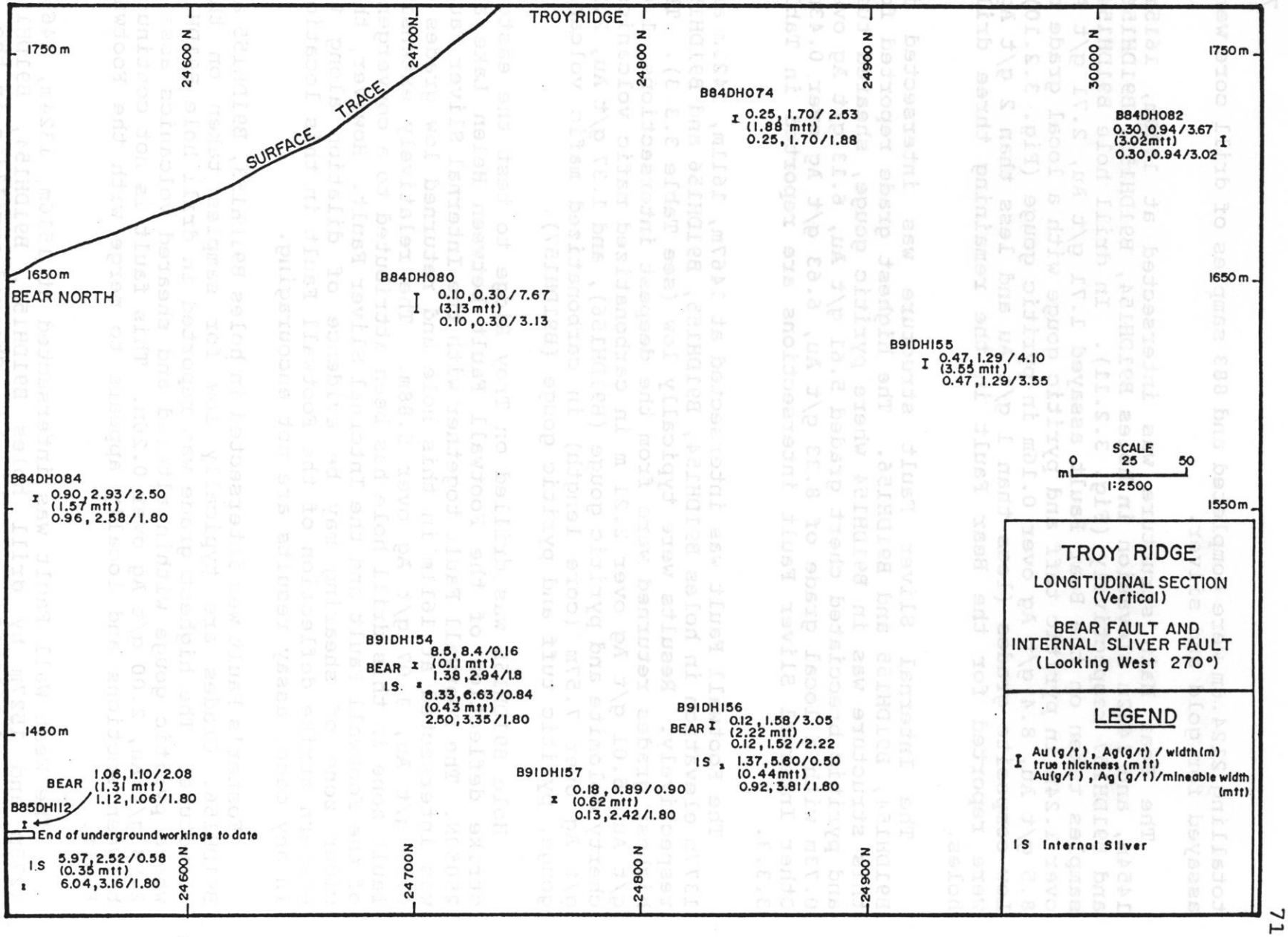


Figure 3.2.11 Troy Ridge longitudinal section showing locations of 1991 intersections on the Bear Fault and on the Internal Sliver Fault.

GOLDEN BEAR OPERATING COMPANY LTD.
DIAMOND DRILL HOLE SUMMARY FOR 1991 TROY RIDGE SURFACE DRILLING

CONTRACTOR: P. Boisvenu Drilling RIG: Val'Dor 3000

DATE	HOLE #	AREA	LOCATION	ELEVATION (m)	AZIMUTH	DIP	LENGTH (m)	INTERSECTION (m)	WIDTH (m)	GRADE/TRUE WIDTH (gms Au/t,gms Ag/t/mtl)	REMARKS
July 25	91-153	Troy Ridge	24636.02 N 24662.65 E	1721.13	273.53°	-60.8°	0.00 to 273.71	101.88 to 102.99	1.11	0.06, 0.83 / 0.69	Foster's Fault: gouge and pyritic sheared tuff within argillaceous epiclastic sediments.
								225.61 to 226.11	0.50	1.03, 1.00 / 0.50t	Sheared argillite in the hanging wall to the West Wall Fault.
								233.11 to 233.97	0.86	0.12, 0.80 / 0.54	West Wall Fault: pyritic gouge at contact of volcanic rocks and the main carbonate package.
								240.36 to 240.48	0.12	1.54, 1.00 / 0.12t	Pyritic gouge in the carbonate lens beyond the West Wall Fault.
July 29	91-154	Troy Ridge	24700.54 N 24875.55 E	1670.59	269.41°	-60.1°	0.00 to 411.93	219.12 to 220.99	1.87	1.71, 2.71 / 1.24	Bear Fault: pyritic gouge, sheared tuff and 1 lost of 0.83m. Assays up to 8.50, 8.4/0.16m.
								227.11 to 228.53	1.42	5.61, 6.13 / 0.73	Internal Sliver Fault: pyritic gouge, sheared tuff, and pyritic brecciated chert.
								234.90 to 235.68	0.78	0.24, 1.40 / 0.24	Footwall Fault: pyritic gouge.
								258.70 to 258.90	0.20	1.54, 2.60 / 0.20t	Carbonatized mafic volcanic rock following the Footwall Fault.
								260.75 to 261.35	0.60	1.34, 1.80 / 0.60t	Carbonatized mafic volcanic rock following the Footwall Fault.
								398.60 to 398.70	0.10	0.51, 1.20 / 0.07	West Wall Fault: fault gouge at contact of volcanic rock and the main carbonate package.
August 9	91-155	Troy Ridge	24917.19 N 24822.14 E	1796.32	267.80°	-56.3°	0.00 to 414.53	218.98 to 223.08	4.10	0.47, 1.29 / 3.55	Bear Fault: pyritic gouge with 2 lost zones totalling 2.30m.
								223.24 to 230.26	7.02	0.37, 1.07 / 5.66	Internal Sliver Fault & Footwall Fault: pyritic gouge with 3 lost zones totalling 1.13m.
								233.77 to 235.24	1.47	1.15, 2.20 / 1.23	Foster's Fault: black gouge within carbonatized volcanic rock.
								243.82 to 244.20	0.38	1.40, 1.00 / 0.38t	Epiclastic sediments following Foster's Fault.
								260.40 to 261.40	1.00	1.30, 2.00 / 1.00t	Carbonatized volcanic rock.
								397.79 to 397.97	0.18	0.55, 2.60 / 0.10	West Wall Fault: silicified chert breccia at contact of volcanic and carbonate packages.
August 18	91-156	Troy Ridge	24781.56 N 24912.47 E	1687.67	288.79°	-57.2°	0.00 to 490.42	272.67 to 275.72	3.05	0.12, 1.58 / 2.22	Bear Fault: pyritic gouge, pyritic chert and dolomite breccias.
								289.40 to 290.40	1.00	2.23, 2.00 / 1.00t	Dolomite and chert on footwall side of the Internal Sliver Fault.
								296.36 to 296.86	0.50	1.37, 5.60 / 0.40	Internal Sliver Fault: pyritic dolomite breccia within carbonate lens.
								306.35 to 307.35	1.00	1.82, 5.80 / 1.00t	Dolomite and chert on footwall side of the Internal Sliver Fault.
								308.34 to 309.46	1.11	1.61, 2.80 / 1.11t	Dolomite and chert adjacent to the Footwall Fault on hanging wall side.
								309.46 to 312.13	2.67	1.60, 5.01 / 2.21	Footwall Fault: pyritic gouge, dolomite, chert and carbonatized volcanics.
								313.91 to 314.48	0.57	1.20, 3.00 / 0.57t	Carbonatized mafic volcanics on hanging wall side of Foster's Fault.
								318.66 to 318.97	0.31	2.98, 2.00 / 0.26	Foster's Fault: pyritic gouge within altered and sheared volcanics.
								324.15 to 324.92	0.77	1.51, 1.20 / 0.77t	Carbonatized, fuchsitic andesite? dyke.
								478.52 to 480.06	1.54	0.27, 1.23 / 1.18	West Wall Fault: fault gouge at contact of altered volcanics and dolomite.
August 25	91-157	Troy Ridge	24781.54 N 24912.55 E	1687.77	259.21°	-66.9°	0.00 to 371.55	291.95 to 292.86	0.91	0.18, 0.89 / 0.91t	Bear Fault: pyritic gouge, tuff and argillite at contact of volcanics and dolomite.
								305.28 to 306.10	0.82	1.61, 1.40 / 0.82t	Dolomite with chert interbeds on footwall side of the Bear Fault.
								316.28 to 316.68	0.40	1.41, 0.80 / 0.40t	Argillaceous sediment at contact of dolomite and chert.
								332.52 to 333.00	0.48	4.42, 3.00 / 0.48t	Dolomite with chert interbeds.
								333.00 to 333.50	0.50	1.78, 1.40 / 0.50t	Dolomite with chert interbeds.
								334.15 to 341.72	7.57	1.37, 2.22 / 7.57t	Footwall Fault: carbonatized volcanic rock, gouge, pyritic tuff and pyritic gouge on the footwall side of the carbonate lens.
Sept. 2	91-158	Bear North	24146.87 N 24640.66 E	1623.52	266.70°	-44.5°	0.00 to 162.46	134.30 to 135.25	0.95	0.07, 2.00 / 0.95t	West Wall Fault: black folded argillite with 10% gouge and 5-10% dolomite and calcite vein fragments.

t Represents core length, not true thickness.

TOTAL TROY RIDGE SURFACE DRILLING = 2124.60m
SURFACE HOLES DRILLED ON TROY RIDGE = 6
TOTAL 1991 DRILLING = 4976.76m
TOTAL NUMBER OF HOLES = 22

Table 3.2.3 Golden Bear 1991 Troy Ridge surface diamond drill hole summary.

hanging wall of the West Wall Fault of hole B91DH153 had elevated assays of 1.03 g/t Au, 1.00 g/t Ag over 0.50m. No other significant assays were recovered on or near this structure and it is not thought to contain any significant mineralization (Table 3.3.3). This conclusion is also supported by the surface sampling results.

Conclusions

Mapping and sampling confirmed the positions of the Bear Fault, Footwall Fault and the West Wall Fault in the Troy Ridge area. Drilling in 1991 successfully extended the known strike length of these structures 380m north, but core assay results indicated that the structures carry much lower gold values than those associated with these same structures in the Bear Main Zone. Relatively high assay values were reported only locally across narrow zones (i.e. 8.5 g/t Au, 8.4 g/t Ag over 0.11m, in B91DH154).

Drilling in the Troy Ridge area confirmed the northern strike extension of the main structures; the Bear Fault, the Footwall Fault and the West Wall Fault at the 1425m, 1380m and 1600m levels respectively. The 1991 drill holes did not intersect the Bear Fault deep enough to confirm whether the ore zone plunges north under this area. A "roll" in the Bear structure (as seen at the 1450m elevation in the Bear Main Zone) was not observed in the Troy Ridge area. The wide zone of sheared rock that represents the Footwall Fault + the Internal Sliver Fault (?) in B91DH155 may be considered evidence of dilation along the eastern strike deflection of the Footwall Fault between Helen Lake and 25050N. However, high grade material was not associated with this wide zone of shearing.

Grades for all intersections tend to decrease to the north. The highest grade material was intersected on the Internal Sliver Fault in B91DH154. Anomalous grades for single samples were reported, however, composite grades calculated across structures and/or across minable widths tended to be low (typically less than 2 g/t Au). Generally, the Bear and Internal Sliver Faults had better grades and future drilling should be targeted on these structures rather than on the Footwall Fault.

Drill hole intersections and extensive surface sampling of the West Wall Fault have demonstrated that there is limited potential for this structure. At this time no further work on the West Wall Fault is recommended.

Future drilling should continue to track the main structures at approximately the 1400m level (and deeper) to continue to delineate the strike and dip extent of the ore-bearing structures while exploring for an orebody akin to the Bear Main Zone.

3.3.2 MUSE RIDGE

Introduction

Muse Ridge is on the south side of Bearskin Lake and separates the Bearskin Creek and Samotua River valleys (Fig.3.1.1). Two regional shear structures, the Ophir Break, a zone of intense shearing and carbonate alteration, and the Ultramafic Fault, trend north-northwest across Muse Ridge. The Ophir Break is a regional fault zone and includes the Bear Fault structure and the Bear Main Zone on the north side of Bearskin Lake (Fig. 3.2.12). The Ultramafic Fault comprises two parallel structures which strike north-northwest along the northeastern end of Muse Ridge. This area is marked by a large gossanous zone.

Geology

The main lithologies on Muse Ridge are mafic volcanic rock, mafic epiclastic sediments, argillite and gabbro. Two major north-northwest trending structures cut northwest-striking, west-dipping stratigraphy. These are the Ophir Break and the Ultramafic Fault.

The Ophir Break strikes northwest (150°) and dips moderately (62°) northeast. The structure is comprised of three major parallel faults below the 1400m elevation and a single fault above this elevation (Fig.3.2.12). Interbedded argillite and mafic lapilli tuff are on the hanging wall side and mafic flows form the footwall to the fault zone.

The footwall stratigraphy is dominated by mafic volcanic flows that are both plagioclase and hornblende phyric, strongly foliated and have a distinctive phyllitic sheen (Fig.3.2.12). These mafic volcanic flows are analogous to the mafic flow volcanic rock seen on the Airport Road roadcut on the north side of Bearskin Lake.

Outcrops of interbedded black argillite and carbonatized mafic volcanic rocks are exposed in a steep creek canyon on the east side of the Ophir Break. These hanging wall clastic rocks are very similar to those seen in the 1991 Bear South drill core. Mafic lapilli and ash tuff outcrop to the east of the clastic rocks. Minor folding of the stratigraphy is associated with the fault. Axial planes trend 145° and fold axes plunge 30° northeast.

A small gabbro body as well as andesitic and rhyolitic dykes intrude the volcanic rocks near the Ophir Break. A rhyolite dyke, up to 3.00m wide, occurs within the fault structure (Figs. 3.2.12 and 3.2.13). The dyke strikes 150° and dips 75° northeast.

Mafic tuffs and mafic ash tuffs outcrop on the northeastern end of Muse Ridge. As in the Ophir Break area, the volcanic rocks

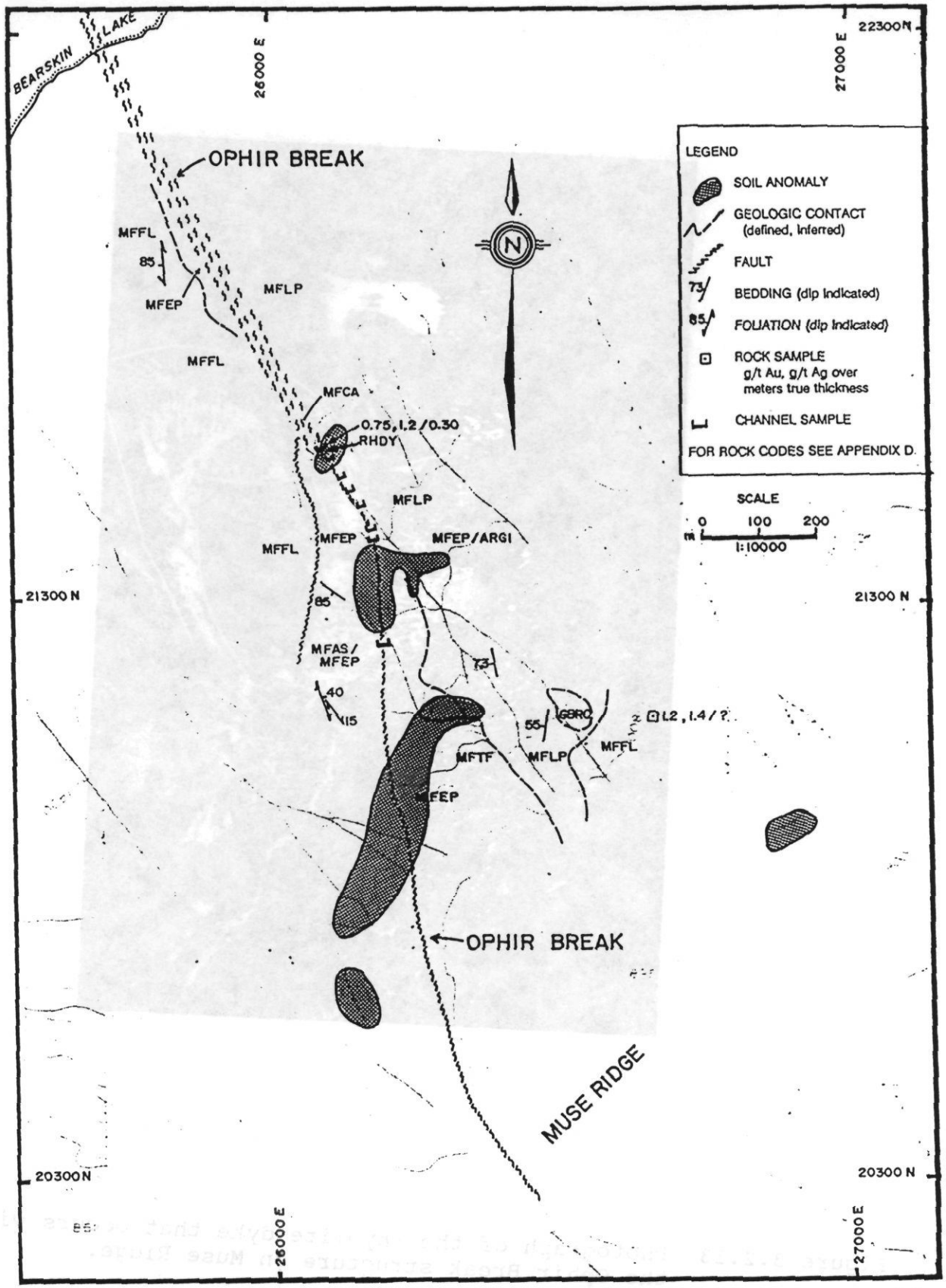


Figure 3.2.12 Geology map of the Ophir Break on Muse Ridge summarizing 1991 work.

Figure 3.2.13 Photograph of the rhyolite dyke that occurs within the Ophir Break structure on Muse Ridge.

are well foliated with a north striking, steeply west dipping foliation. Locally, minor folding is observed. A small gabbro body intrudes the pyroclastic rocks (Fig. 3.2.12).

The Ultramafic Fault trends northwest across the northeast end of Muse Ridge. In this area the fault occurs as two structures which bound mafic lapilli tuff. Near the faults, lapilli tuff is locally iron carbonate altered, bleached and brecciated. A large gossanous zone of iron carbonate alteration occurs in the hanging wall of the eastern structure. This gossan is continuous across the ridge and highly visible from the Mine Access Road on the south side of Muse Ridge (Fig. 3.2.14). The western structure is less altered.

Previous Exploration

Previous exploration in the area of the Ophir Break on Muse ridge includes 1:5000 scale mapping and contour soil/talus sampling. Previous chip sampling returned assays up to 3.0 g/t Au, 9.8 g/t Ag and 1.2 g/t Au, 2.4 g/t Ag. High arsenic values (up to 10,000 ppb As) for soil samples collected along the southward extension of the Ophir Break structure have also been reported.

From 1983 to 1985 Chevron Minerals Ltd. conducted geochemistry, prospecting and geophysics on the top of and south side of Muse Ridge. CML soil sampling results indicated spotty weak Au anomalies (up to 160ppb Au) and a CML VLF-EM survey produced one weak indication of a structure on the south-facing slope of Muse Ridge.

In 1990, ten rock samples were taken with the highest values being 43ppb Au, 0.3ppm Ag over 0.10m for gold and 14ppb Au, 0.8ppm Ag over 0.20m for silver. Results for As and Hg were as high as 232ppm As and 0.330ppm Hg indicating some epithermal activity has taken place along this fault.

On the northeastern part of Muse Ridge contour soil sampling was conducted by CML at the 900m, 1150m, 1350m, 1400m, 1500m, and 1600m elevations using a 50m sample spacing. Results were typically trace in Au and Ag with a high assay result of 50ppb on the 1400m contour west of the western structure of the Ultramafic Fault.

1991 Activities and Results

In 1991, 1:5000 scale mapping, soil sampling, and rock chip and channel sampling was conducted on the southern extensions of the Ophir Break and Ultramafic Fault. Work was concentrated on the north side of Muse Ridge (Figs. 3.2.12).

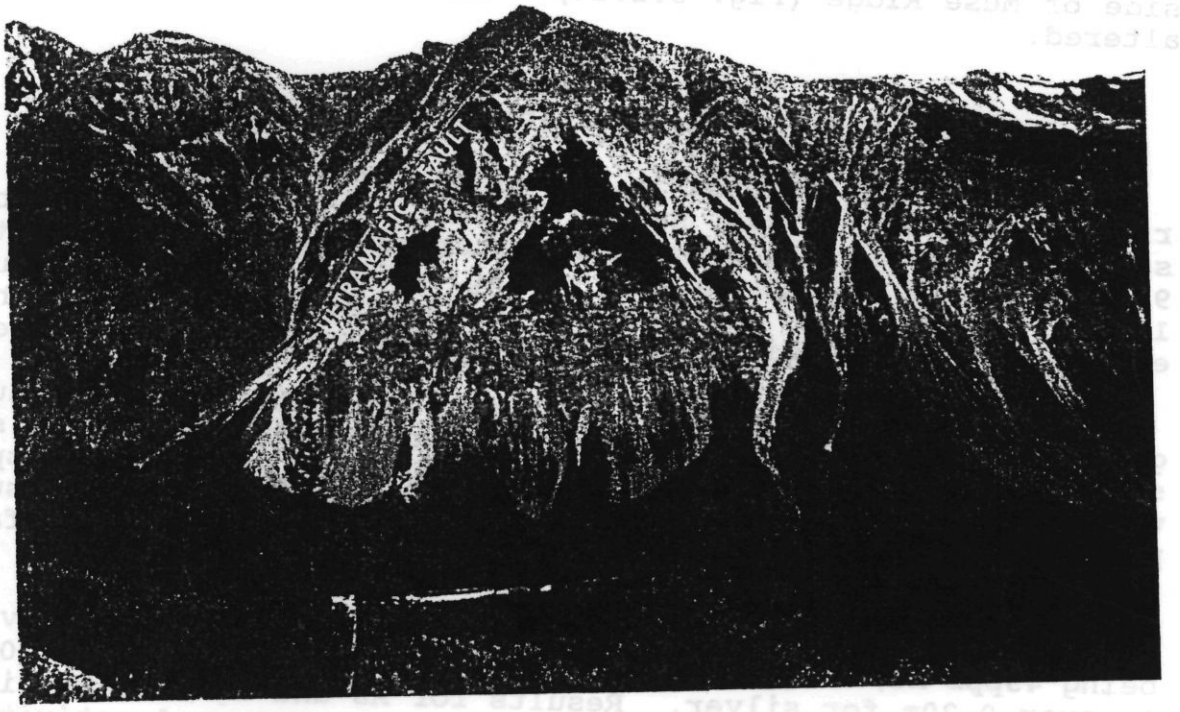


Figure 3.2.14 Photograph of the south side of Muse Ridge showing the gossanous zone of iron carbonate alteration associated with the Ultramafic Fault.

A total of 309 soil samples were taken at five different elevations across the Ophir Break on the north side of Muse Ridge. The highest sample returned was 59ppb Au. Several weak anomalies (10 to 60ppb Au) occur along the fault at 1300m, 1500m and 1700m elevation. Another weak anomaly (27 to 46ppb Au) occurs 500m to the southeast of the Ophir Break at the 1900m elevation (top of the ridge; Fig. 3.2.12).

Below the 1400m elevation the Ophir Break consists of three parallel faults expressed as limonitic argillite breccia, graphitic shears and carbonatized mafic volcanic rock (Fig. 3.2.15). Samples across these structures grade up to 0.75 g/t Au over 0.30m and up to 1.6 g/t Ag over 1.00m. Above the 1400m elevation, the Ophir Break is a single structure which is expressed as a limonitic breccia of altered volcanics within graphitic shears (Fig. 3.2.16). Samples taken across the structure above the 1400m elevation grade up to 0.60 g/t Au over 2.00m and up to 3.0 g/t Ag over 0.25m.

On the footwall side of the Ophir Break on Muse Ridge, at the 1290m elevation, a rhyolite dyke is exposed in a creek bottom (Fig. 3.2.13). The dyke is up to 3m wide, strikes parallel to the fault zone (150°/75°NE), and grades up to 0.55 g/t Au over 3.0m and up to 0.8 g/t Ag over 1.2m.

The best grade received in the Muse Ridge area was 3.9 g/t Au, 6.4 g/t Ag for quartz vein float sampled west of the Ophir Break.

Induced Coupled Plasma (ICP) analysis for 28 elements and fire-assay Au was completed on 24 samples from Ophir Break in this area. The highest Au assay returned was 1.2 g/t Au for a quartz vein in mafic volcanic flow rock sampled east of the Ophir Break (this sample is also anomalous in nickel and cobalt) (Fig. 3.2.12). As and Hg values for samples taken on the Ophir Break on Muse Ridge are up to >2000ppm As and 1.5ppm Hg over 0.25m, indicating some epithermal activity has taken place along this fault.

Soil sampling over the northeastern end of Muse Ridge in the area of the Ultramafic Fault, was conducted on the 1050m, 1250m, 1450m, and 1550m contours, as well as along the ridge crest, using a 20m sample interval. A total of 291 soil samples were collected. No anomalous values are associated with the gossanous zone. Anomalous results include 36ppb on the 1450m contour and 55ppb on the 1050m contour. These results occur in or near creeks that are coincident with the western structure of the Ultramafic Fault. The highest soil sample result was 57ppb received for a sample taken west of the Ultramafic Fault.

Rock sampling on the northeastern end of Muse Ridge focused on the gossanous zone of iron carbonate altered rocks in the hanging wall of the Ultramafic Fault and on the Ultramafic Fault itself. 61 rock samples were collected. The highest assays received for

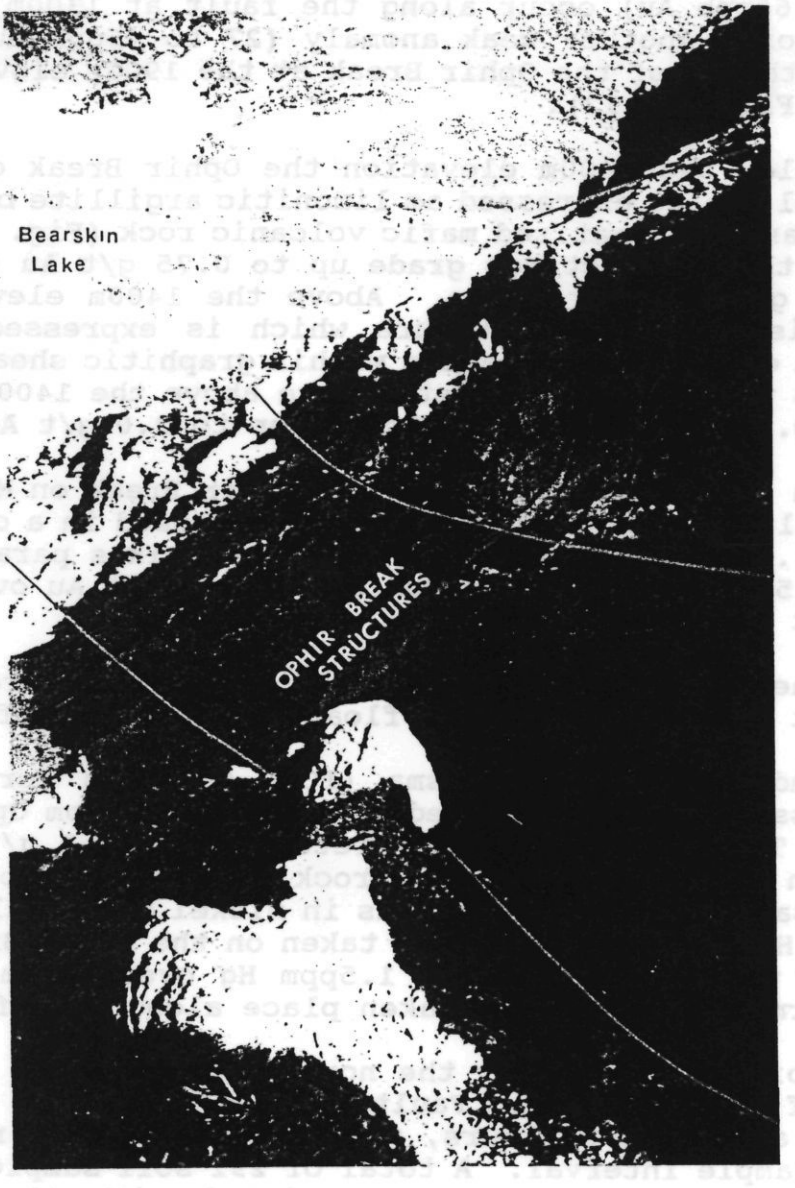


Figure 3.2.15 Photograph of the Ophir Break below the 1400m level showing three parallel faults. Note the backpack and sampler for scale.

Figure 3.2.16 Photograph of the Ophir Break above the 1400m level showing a single structure.

samples taken in the gossanous zone were 0.55 g/t Au, 1.6 g/t Ag for a grab sample of felsenmeer and 0.58 g/t Au, 1.8 g/t Ag for a sample of hematitic lapilli tuff. ICP and Fire-Assay Au analyses (completed on four samples from the gossanous zone) returned up to 0.4ppm Hg and 340ppm Zn.

Rock samples taken on the Ultramafic fault at 1040m elevation assayed at 1.8 g/t Au, 2.0 g/t Ag over 0.7m and 0.7 g/t Au, 1.4 g/t Ag over 0.40m. These samples were collected near the 55ppb soil anomaly described above.

Conclusions

The Ophir Break is a regional fault zone that includes the Bear Fault structure and the Bear Main Zone (Fig. 3.2.17). Extensive channel sampling and contour soil sampling across this structure returned weakly anomalous gold and silver assay values. A continuation of channel sampling across the Ophir Break structure and 1:5000 scale mapping from Muse Ridge south to the Samotua River is recommended to further test potential mineralization along this regional fault zone.

The Ultramafic Fault occurs as two parallel structures that strike north-northwest across the northeastern end of Muse Ridge. A gossanous zone of iron carbonate alteration occurs in mafic volcanic rocks in the hanging wall of the eastern structure. This gossan is continuous across the ridge and highly visible from the Mine Access Road on the south side of Muse Ridge. The western structure is less altered.

Anomalous assay results (1.8 g/t Au, 2.0 g/t Ag over 0.7m) were received for a sample taken on the Ultramafic Fault at the 1040m elevation. Further mapping and channel sampling is recommended in this area and north to Bearskin Lake. 1:5000 scale mapping, rock and soil sampling on the south side of Muse ridge, across the southern extension of the gossanous zone is also recommended.

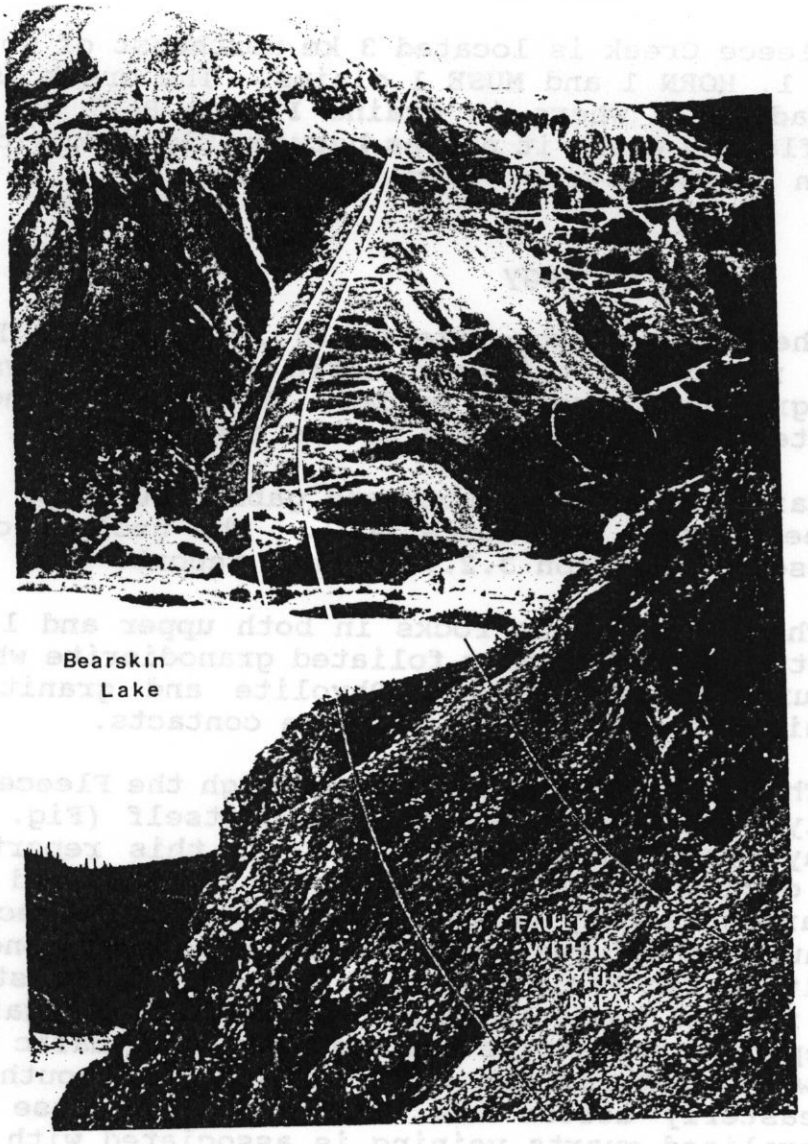


Figure 3.2.17 Photograph looking north from the south side of Bearskin Lake. The Ophir Break is a regional fault zone that includes the Bear Fault structure and the Bear Main Zone on the north side of Bearskin Lake (background), and strikes north-northwest across Muse Ridge (foreground).

3.2.5 FLEECE CREEK

Introduction

Fleece Creek is located 3 km northeast of Golden Bear camp on the EL 1, HORN 1 and MUSE 1 claims. The creek is east flowing at its headwaters where it drains Fleece Bowl and turns to become south flowing where it passes between Eight-No Ridge and Troy Ridge to join Bearskin Creek (Fig. 3.2.18).

Geology

The steep canyon-like walls in the lower Fleece Creek area expose mafic ash tuff and mafic volcanic flows. The volcanic stratigraphy is locally folded. Foliation is north striking and dips steeply to moderately to the east.

Mafic pyroclastic rock and gabbro outcrops at the headwaters of Fleece Creek in Fleece Bowl. The geology of Fleece Bowl is discussed in section 3.2.7 of this report.

The metavolcanic rocks in both upper and lower Fleece Creek are intruded by Triassic foliated granodiorite which is exposed on the surrounding ridges. Rhyolite and granitic dykes intrude volcanic rocks near the intrusive contacts.

The Ultramafic Fault cuts through the Fleece Creek area and is locally coincident with the creek itself (Fig. 3.2.18). In the Highway Creek area (section 3.3.6, this report) the Ultramafic Fault occurs as two fault structures that bound a carbonate body. The carbonate body terminates abruptly at Fleece Creek where the two fault structures merge to form one fault zone in Fleece Creek. The Ultramafic Fault occurs as a single fault structure in Fleece Creek from 1375m to 1250m elevation where it again bifurcates into two separate structures that bound sheared mafic volcanic ash tuff. The two structures are continuous to the south and trend south-southeasterly across the eastern end of Muse Ridge. Locally, unmineralized quartz veining is associated with the fault. Mafic volcanic rocks marginal to faulting have been carbonate altered.

Previous Exploration

Chevron Minerals Limited completed limited mapping and rock sampling in this area. Mapping by J. Oliver (1989) covered the upper regions of Fleece Creek including the area around 1375m elevation where the Ultramafic Fault converges to form one fault zone.

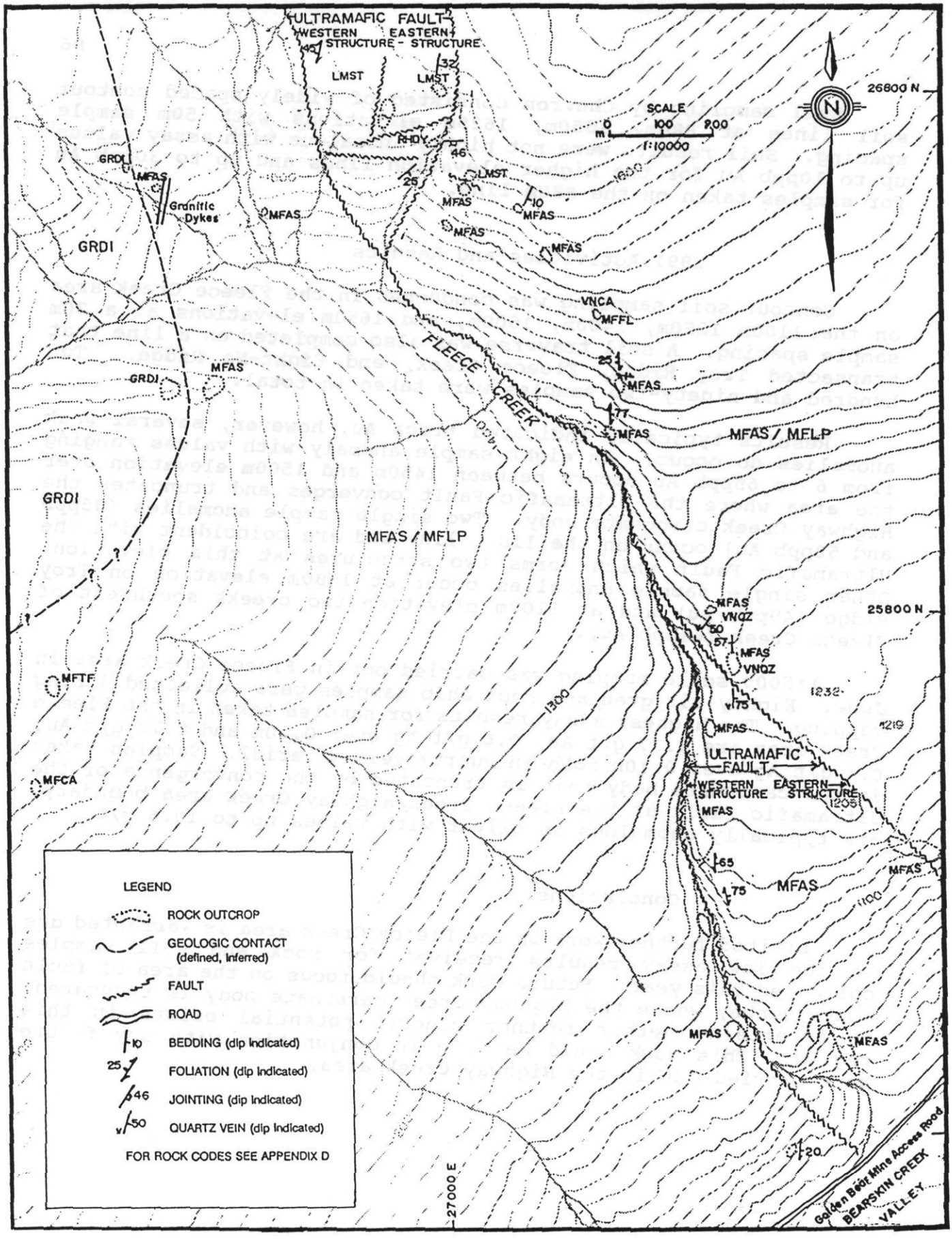


Figure 3.2.18 Geology map of Fleece Creek area summarizing 1991 work.

Soil sampling by Chevron consisted of widely spaced contour soil lines at 880m, 1550m, 1625m elevations with 50m sample spacing. Soil results were not highly anomalous with assay values up to 10ppb Au for the higher elevation lines and up to 30ppb Au for samples taken on the 880m line.

1991 Activities and Results

Contour soil sampling was conducted in the Fleece Creek area on the 1100m 1250m, 1400m, 1500m, and 1650m elevations at a 20m sample spacing. A soil traverse was also completed on a line that transected Troy Ridge, Fleece Creek, and Eight-No Ridge. Two hundred and ninety-two samples were taken in total.

Results typically indicated trace Au, however, several weak anomalies do occur. An eight sample anomaly with values ranging from 6 to 65ppb Au occurs between 1450m and 1500m elevation over the area where the Ultramafic Fault converges and truncates the Highway Creek carbonate body. Two single sample anomalies (35ppb and 52ppb Au) occur on the 1100m line and are coincident with the Ultramafic Fault which forms two structures at this elevation. Other single sample anomalies occur at 1580m elevation on Troy Ridge (49ppb Au) and at 1100m elevation two creeks southwest of Fleece Creek (61ppb Au).

1:5000 scale mapping was carried out in Fleece Creek area in June. Eighty-six grab and rock chip samples were collected during mapping. The highest assay results for samples taken in the Fleece Creek area are 1.37 g/t Au, 0.6 g/t Ag over 0.10m and 0.72 g/t Au, 0.4 g/t Ag over 0.10m both in quartz vein material. Samples taken in the carbonate body that is truncated by the convergence of the Ultramafic Fault at the Fleece Creek/Highway Creek area boundary, are typically anomalous in silver with values up to 10.6 g/t.

Conclusions

Limited further work in the Fleece Creek area is warranted due to the low assay results received for rock and soil samples collected this year. Future work should focus on the area of fault convergence, where the Highway Creek carbonate body is truncated, to ascertain whether further mineral potential exists in this region. This work could be done in conjunction with any future work carried out in the Highway Creek area.

3.3.6 HIGHWAY CREEK

Introduction

Highway Creek is a north flowing tributary of Sam Creek. It is located at the northern end of the claim block on the El 2 and El 3 claims where it flows through a relatively flat hanging valley between Kaiser Ridge and Eight-No Ridge. The creek occurs along a geographic depression which is approximately coincident with the Ultramafic Fault. A smaller, parallel creek to the east (East Highway Creek) is coincident with an eastern splay of the Ultramafic Fault (Fig. 3.2.19). The broad, open slopes that typify the Highway Creek area do not offer extensive exposure of bedrock geology.

Geology

A large fault-bounded carbonate body is exposed along the length of Highway Creek. The fault that hosts this carbonate lens is the southern strike extension of the Ultramafic Fault. This fault bifurcates north of the Sam Creek and Highway Creek junction, producing an eastern structure and a western structure that form the boundaries of the carbonate stratigraphy (Fig. 3.2.19). The carbonate body terminates abruptly at Fleece Creek where the two fault structures merge to form one fault zone within mafic volcanic rocks. The Ultramafic Fault persists south of the Fleece Creek and Bearskin Creek valleys and is continuous across the eastern end of Muse Ridge.

Foliation within the carbonate body varies but generally strikes north and dips steeply east. The carbonate rocks are flanked by recessive, phyllitic metavolcanic rocks which are poorly exposed on the gentle valley slopes. The metasedimentary and metavolcanic rocks are intruded by Triassic foliated granodiorite, a resistant rock type, that is exposed on Eight-No Ridge to the east and on Kaiser Ridge to the west (Fig. 3.2.19).

Previous Exploration

The Highway Creek area has not been extensively explored. Before 1991, the area was mapped at a 1:5000 scale with minimal rock chip sampling. Two soil traverses were done across east-west lines perpendicular to the carbonate-volcanic fault contact.

Compilation of existing data has shown that Au soil anomalies occur on the traverses across the fault contacts of the carbonate unit. Gold values increase from background values of trace Au to 5ppb Au in the mafic volcanic rocks, up to 70ppb Au at the fault contacts, and up to 65ppb Au within the carbonate body.

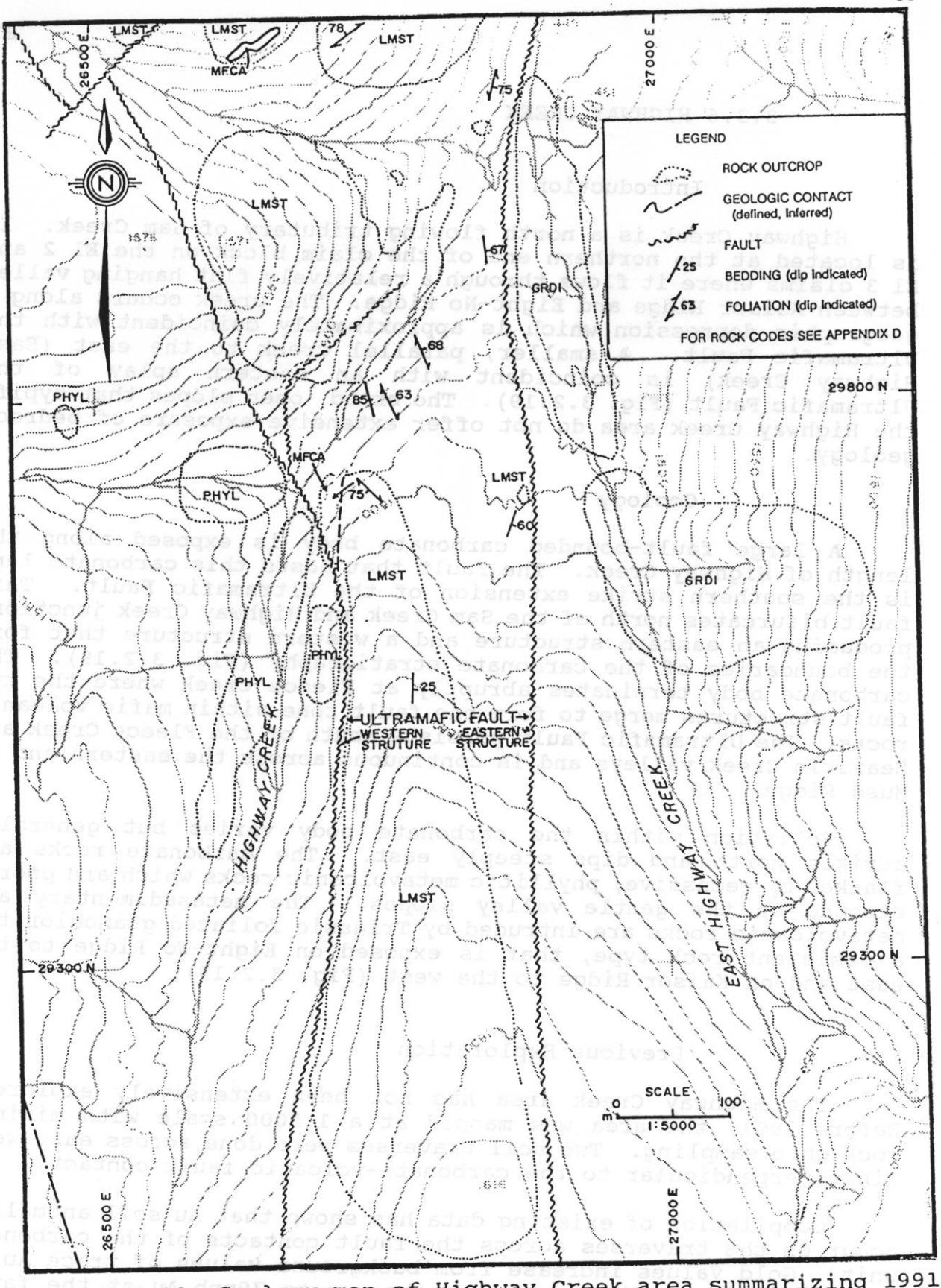


Figure 3.2.19 Geology map of Highway Creek area summarizing 1991 work.

1991 Activities and Results

Contour soil sampling and one reconnaissance traverse were conducted at the north end of Highway Creek across the trend of the Ultramafic Fault.

Rock samples were taken of altered volcanic rocks, limestone, and vein material. Of the 12 rock samples collected, the highest gold assay reported was 0.38 g/t Au, 1.6 g/t Ag over 1.00 m for a sample of carbonate altered mafic volcanic rock. Other assay results include 0.34 g/t Au, 1.8 g/t Ag over 0.70 m in limestone and 0.24 g/t Au, 1.0 g/t Ag over 0.60 m in chert breccia.

One hundred and twenty-one soil samples were collected on two contour controlled traverses. One traverse was completed across the central portion of the carbonate body and a second traverse was conducted across the northernmost exposure of the carbonate body (Fig. 3.2.19). Soil samples were sent to Bondar-Clegg in Vancouver for 30 element ICP analysis. Results ranged from trace Au to 84ppb Au and were consistently <0.2ppb in Ag.

Anomalous Au results (up to 84ppb Au) corresponded to carbonate outcrop on the central soil line. Weakly anomalous As (up to 250ppm As) and Hg (up to 788ppb Hg) results are coincident with the high gold values. Anomalous Au results on the western flank of the carbonate body are also coincident with a slight depletion in Fe, Mg, and Mn and with a slight enrichment in La.

Anomalous Au results (up to 73ppb Au) were also returned for samples taken where a west flowing creek that drains from Eight-No Ridge meets East Highway Creek. Relatively high arsenic (up to 233ppm As) and copper (up to 524ppm Cu) values correspond to this weak gold anomaly.

The northernmost soil traverse returned local weakly anomalous gold results (up to 70ppb Au) over the carbonate body as well as anomalous gold (up to 71ppb Au) in four samples taken across East Highway Creek. Significant variations in other elements are not noted to be coincident with these relatively high gold values.

Conclusions

Carbonate rock in fault contact with mafic volcanic rock is a favourable setting for development of Golden Bear-style mineralization.

Soil samples taken this year are not specifically anomalous across the fault zones, but rather generally anomalous across portions of the carbonate body. Rock chip or channel sampling should be conducted within the carbonate body and across the carbonate-volcanic contacts in a more intensive sampling program

than that which has been carried out to date. Sampling should focus particularly on areas of anomalous soil results.

The proximity of a large granodiorite body suggests the potential for development of skarn mineralization in or near the carbonate unit.

A brief reconnaissance traverse across the granodiorite contact on Eight-No Ridge during the staking of the El Fraction indicated that earlier mapping had poorly defined the location of the intrusive-metavolcanic contact. Follow up work including prospecting, 1:5000 mapping and rock sampling should be carried out across the granodiorite contacts in an effort to establish the location of the contact and to explore for the potential of skarn mineralization.

3.3.2 FLEECE BOWL

Introduction

The Fleece Bowl area, at the headwaters of Fleece Creek, is in the south-central area of the TOTEM 1 claim (Figs. 3.1.1 and 3.2.20). Fleece Bowl extends north from Helen Lake (24900N, 24670E in Troy Ridge area) to approximately 26500N and from Surprise Ridge at 24200E to the start of Fleece Creek at 25800E. Fleece Fault and parallel structures strike north across this area. The focus of work in 1991 was directed towards re-logging all Fleece Bowl diamond drill core (from 1983 and 1984) in order to re-evaluate and re-interpret the geology and to verify and calculate ore reserves.

Geology

The Fleece Bowl area hosts four main lithologies which are, from oldest to youngest: carbonates; interbedded chert and argillite (associated with Black Fault); interbedded mafic lapilli and ash tuff; and gabbro intrusive (Fig. 3.3.21).

Carbonate stratigraphy dominates the western part of Fleece Bowl and includes thickly bedded Permian limestone with local banded and crinoidal limestone, as well as dolomite with interbedded chert (Oliver, 1989). Mafic lapilli and ash tuff is exposed on the east side of the Fleece Bowl area. Gabbro is located in the central south area extending almost to Fleece Creek and is not extensive at depth.

Granodiorite intrudes the carbonate and volcanic stratigraphy and is exposed northeast of Fleece Bowl (Fig. 3.2.21).

North-trending anticlines and synclines are prevalent throughout Fleece Bowl area. Tight isoclinal fold structures are clearly seen on the cliffs on the west side of the bowl (Fig. 3.2.21; Oliver, 1989). The main antiform localized over the Fleece Zone (near the bottom of Fleece valley) is plunging southwards at approximately 25° and is bounded to the west by Fleece Fault and to the east by Black Fault (Oliver, 1989).

Three main fault zones trend north (roughly parallel to the fold axis) across Fleece Bowl. These are, from east to west, the Black Fault, Fleece Fault, and Footwall of Tuff Fault (FWT). Titley (1987) suggested that the West Wall fault and the Bear Fault merge in Fleece Bowl to form the Fleece Fault.

To the north of Troy Ridge, the Black Fault diverges northeast away from Fleece Fault to follow the eastern limb of the main antiform in the Fleece Bowl (Wober and Shannon, 1985). The Black Fault trends north, dips moderately east and parallels the Fleece

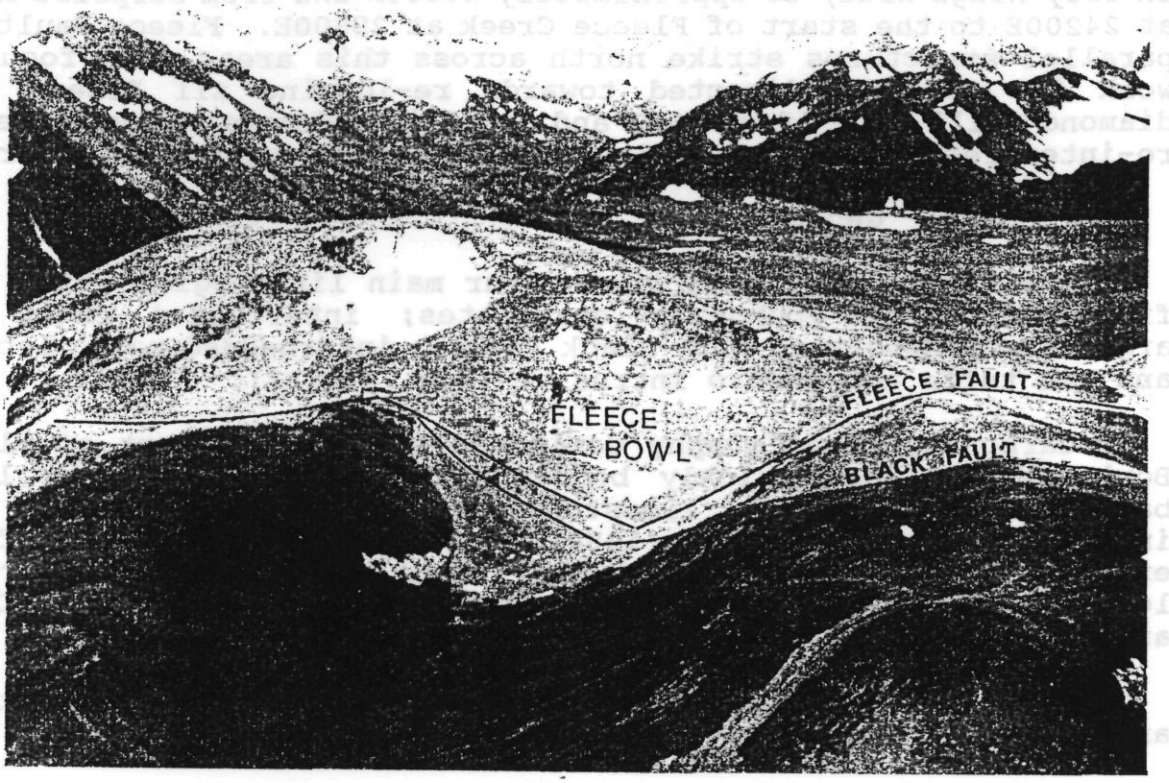


Figure 3.2.20 Photograph of Fleece Bowl looking west and showing the location of major fault structures.

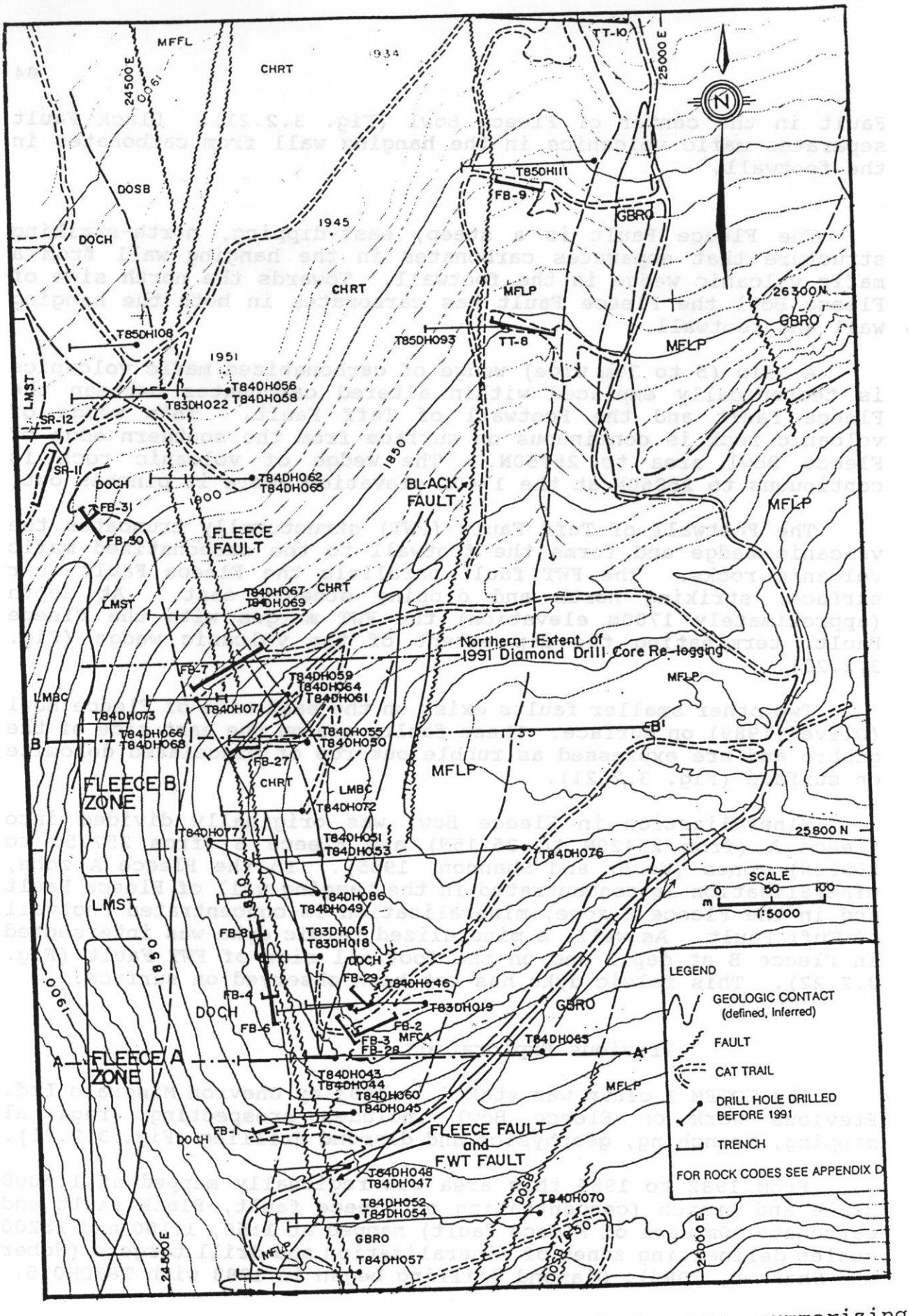


Figure 3.2.21 Geology map of Fleece Bowl area summarizing previous work and indicating areas for future work.

Fault in the center of Fleece Bowl (Fig. 3.2.21). Black Fault separates mafic volcanics in the hanging wall from carbonates in the footwall.

The Fleece Fault is a steep, east-dipping, north-striking structure that separates carbonates in the hanging wall from a mafic volcanic wedge in the footwall. Towards the north side of Fleece Bowl the Fleece Fault has carbonates in both the hanging wall and footwall.

A thin (5 to 30m wide) wedge of carbonatized mafic volcanics is tectonically emplaced within altered carbonates between the Fleece Fault and the Footwall of Tuff Fault. This wedge of volcanic rock is continuous on surface from the southern edge of Fleece Bowl area to 25750N. The wedge of volcanic rock is continuous to 25860N at the 1740m elevation where it pinches out.

The Footwall of Tuff Fault (FWT) structurally truncates the volcanic wedge and forms the footwall to the carbonatized mafic volcanic rocks. The FWT fault parallels the Fleece Fault near surface, striking north and dipping steeply east. At depth (approximately 1700m elevation) the FWT merges with the Fleece Fault, terminating the dip extent of the volcanic wedge (Fig. 3.2.22).

Two other smaller faults exist on the east side of Fleece Bowl (Oliver,1989) on surface. These faults are on the east side of the gabbro and are expressed as rubble outcrop of brecciated dolomite on surface (Fig. 3.2.21).

Mineralization in Fleece Bowl was originally divided into Fleece A (from 25420N to 25715N) and Fleece B (from 25775N to 25920N) zones (Wober and Shannon, 1985). In the Fleece A zone, mineralization is concentrated in the hanging wall of Fleece Fault and in the Fleece B zone, mineralization is concentrated Footwall of Tuff Fault. As well, a mineralized felsic dyke was intersected in Fleece B at depth and on the footwall side of FWT Fault (Fig. 3.2.22). This felsic dyke has not been observed on surface.

Previous Exploration

The TOTEM 1 claim was staked in 1981 by Chevron Minerals Ltd. Previous work on Fleece Bowl includes prospecting, regional mapping, trenching, geophysics and diamond drilling (Fig. 3.2.21).

From 1982 to 1985 this area was regionally mapped at 1:5000 scale and trench (concentrating on Fleece fault, Black fault and carbonate 60m west of Fleece fault) mapped at 1:50, 1:100 and 1:200 scales delineating zones of mineralization and drill targets (Wober and Shannon, 1985). Diamond drilling began in 1983 with T83DH015,

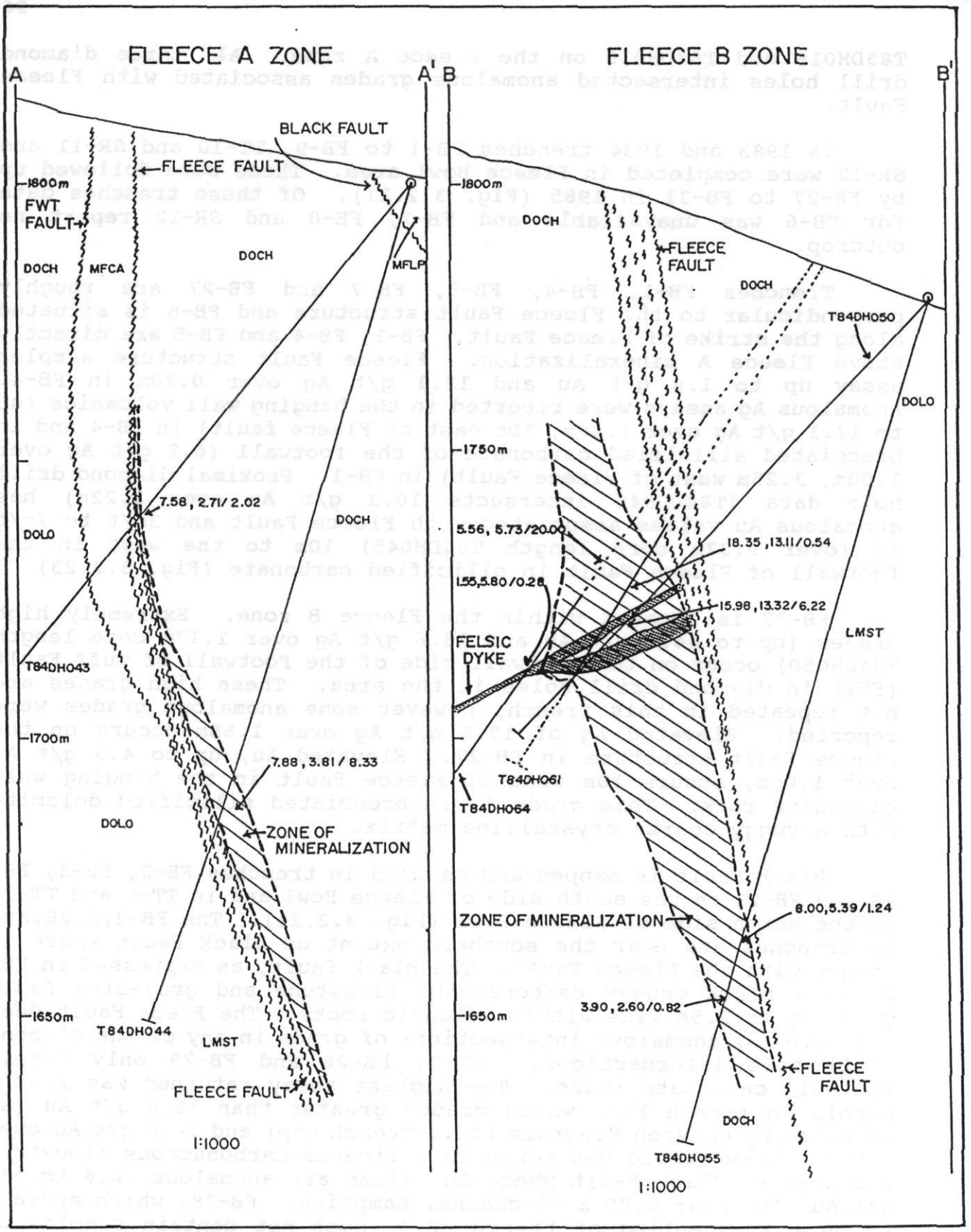


Figure 3.2.22 Cross-section A-A′ and B-B′ through Fleece A and Fleece B zones respectively.

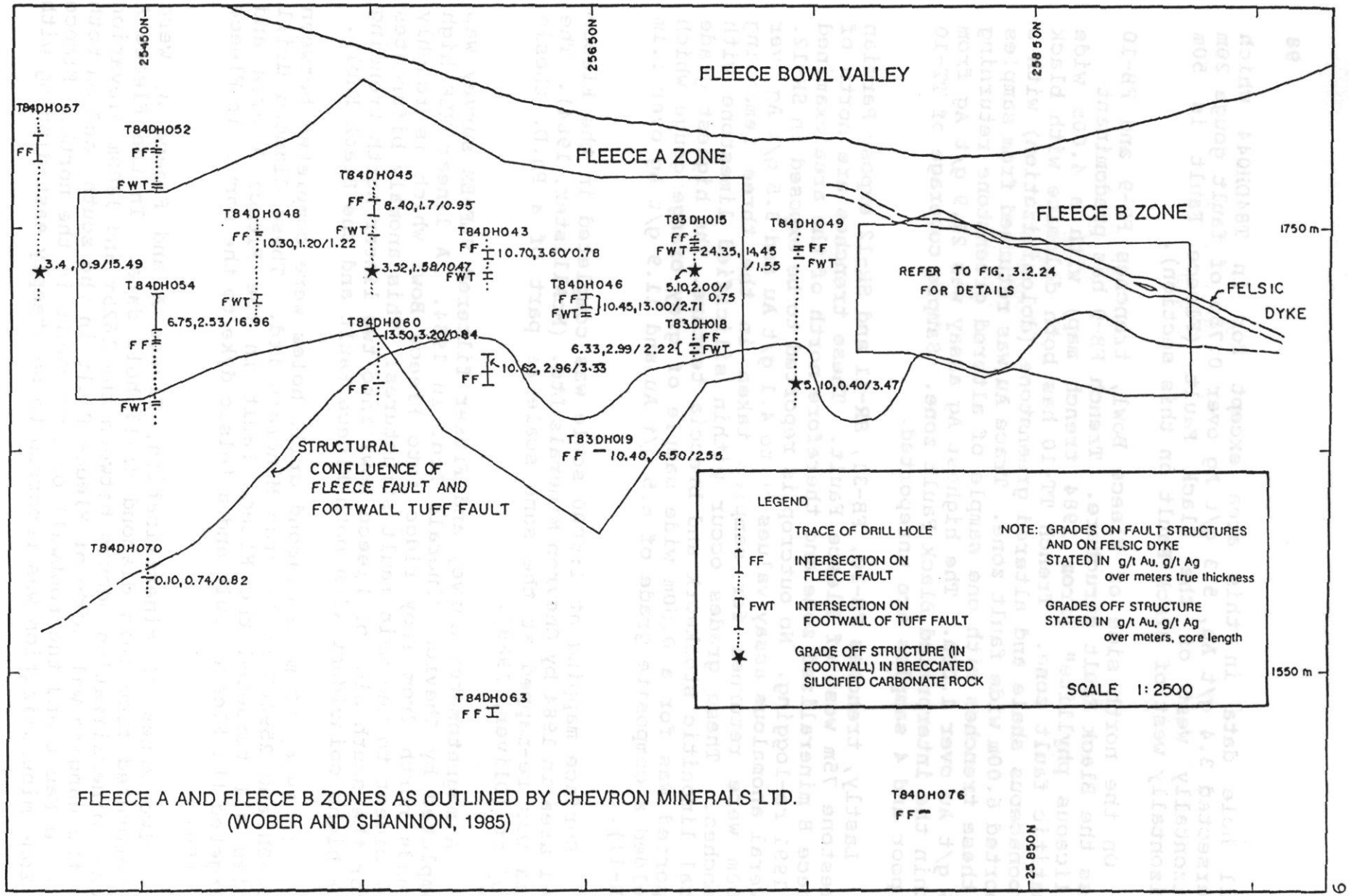
T83DH018 and T83DH019 on the Fleece A zone. All three diamond drill holes intersected anomalous grades associated with Fleece Fault.

In 1983 and 1984 trenches FB-1 to FB-9, TT-10 and SR-11 and SR-12 were completed in Fleece Bowl area. These were followed up by FB-27 to FB-31 in 1985 (Fig. 3.2.21). Of these trenches data for FB-6 was unavailable and FB-7, FB-8 and SR-12 report no outcrop.

Trenches FB-1, FB-4, FB-5, FB-7 and FB-27 are roughly perpendicular to the Fleece Fault structure and FB-6 is situated along the strike of Fleece Fault. FB-1, FB-4 and FB-5 are directly above Fleece A mineralization. Fleece Fault structure samples assay up to 1.6 g/t Au and 12.1 g/t Ag over 0.20m in FB-4. Anomalous Ag assays were reported in the hanging wall volcanics (up to 17.1 g/t Ag over 1.00m, 10m east of Fleece fault) in FB-4 and in brecciated silicified carbonate of the footwall (6.2 g/t Ag over 1.00m, 3.25m west of Fleece Fault) in FB-1. Proximal diamond drill hole data (T84DH048 intersects 10.3 g/t Au over 1.22m) has anomalous Au values associated with Fleece Fault and 3g/t to 7g/t Au (over 9.32m core length T84DH045) 10m to the west in the footwall of Fleece Fault in silicified carbonate (Fig. 3.2.23)

FB-27 is located within the Fleece B zone. Extremely high grades (up to 66.2 g/t Au and 26.6 g/t Ag over 1.17m core length T84DH050) occur on the footwall side of the Footwall of Tuff Fault (FWT) in diamond drill holes in the area. These high grades are not repeated in this trench, however some anomalous grades were reported. Elevated Ag of 13.8 g/t Ag over 1.55m occurs on the Fleece Fault structure in FB-27. Elevated Au, up to 4.9 g/t Au over 1.05m, occurs 10m west of Fleece Fault in the hanging wall carbonate rock. This grade is in brecciated silicified dolomite with a vuggy coarse crystalline matrix.

Black Fault is mapped and sampled in trenches FB-2, FB-3, FB-28 and FB-29 on the south side of Fleece Bowl and in TT-9 and TT-10 on the north side of Fleece Bowl (Fig. 3.2.21). The FB-2,3,28,and 29 trenches are near the southern extent of Black Fault where it merges with the Fleece Fault. The Black Fault, as expressed in FB-2, is a black gougey carbonaceous limestone and grey-blue fault gouge up to 2.5m wide within volcanic rocks. The Black Fault does not have any anomalous intersections of grade in any of the diamond drill hole intersections. FB-3, FB-28 and FB-29 only sample footwall carbonate rocks. The highest assay returned was from a sample in trench FB-3 which graded greater than 10.0 g/t Au (as reported by Chevron Minerals Ltd., trench map) and 14.8 g/t Ag over 1.00m. This sample was taken in siliceous carbonaceous limestone 10m west of Black Fault where Au values are anomalous (0.6 to >10 g/t Au) for over 8.00 m of channel sampling. FB-28, which appears to be a re-sampling of trench FB-3, does not contain samples of anomalous grade. Anomalous Au values are not reflected in diamond



FLEECE A AND FLEECE B ZONES AS OUTLINED BY CHEVRON MINERALS LTD.
(WOBER AND SHANNON, 1985)

Figure 3.2.23 Composite longitudinal section of the Fleece A and Fleece B zones.

drill hole data in this area except for in T84DH044 which intersected 3.4 g/t Au, 5.3 g/t Ag over 0.75m of fault gouge 20m horizontally west of the Black Fault (Fleece Fault is 50m horizontally west of Black Fault on this section).

On the north side of Fleece Bowl, trenches FB-9 and FB-10 cross the Black Fault structure. Trench FB-9 has predominant "siliceous phyllite" (from 1984 trench map) with a 4.00m wide hematitic fault zone. Trench TT-10 has both dolomite with black carbonaceous shale and altered greenstone (dolomitization) with a reported 6.00m wide fault zone. Trace Au was returned from samples in these trenches with one sample of altered greenstone returning 0.6 g/t Au over 1.00m. The highest Ag assay was 21.9 g/t Ag from within the interpreted Black Fault zone. Sample coverage of TT-10 is poor and 4 samples are unreported.

Lastly, trenches FB-30, FB-31, SR-11 and SR-12 expose Permian limestone 75m west of Fleece Fault. These trenches are north of Fleece B mineralized zone and therefore north of the area examined in 1991 re-logging. No outcrop is reported to be exposed in SR-12. Several anomalous assay values up to 4.1 g/t Au and 3.5 g/t Ag over 2.00m were returned for samples taken in the three remaining trenches. These grades occur within silicified limestone with local limonitic stockwork and breccia texture. The highest grade reported was for a 0.50m wide sample of grey orange gouge which yielded a composite grade of 6.5 g/t Au and 11.9 g/t Ag over 1.1m (SR-11).

Surface mapping at 1:5000 scale was completed in the Fleece Bowl area in 1984 by Chevron Minerals Ltd. (McAllister, 1984). The area was re-mapped at the same scale as part of a Ph.D. thesis project (Oliver, 1989).

A magnetometer survey and Fraser filtered VLF-EM survey was completed by Chevron Minerals Ltd. in 1984. A linear VLF high trends north from Troy ridge into Fleece Bowl which is roughly coincident to the main fault structures. This anomaly bifurcates near the south side of Fleece Bowl into two linear north trending VLF highs coincident with both Fleece Fault and the Black Fault.

In 1984, 28 more diamond drill holes were completed between 25400N and 25940N by Chevron Minerals Ltd. These diamond drill holes all targeted the Fleece Fault in the Fleece A area and targeted the Fleece Fault and a felsic dyke to the north, in Fleece B area.

Two zones of mineralization, Fleece A and Fleece B, were interpreted from this diamond drill hole data. In the Fleece A zone, mineralization occurs between the 1625m and 1800m elevation on the hanging wall side of Fleece Fault in the south, and on both Fleece Fault and the Footwall of Tuff Fault in the north. Fleece A Zone mineralization was reported to be steeply east-dipping with

a strike length of 435m and down dip extension of 210m (Wober and Shannon, 1985).

In the Fleece B Zone, mineralization is concentrated on the footwall side of the Fleece Fault structure. Intense brecciation and silicification typify the zone. Mineralization was interpreted to be westerly dipping with strike length of 150m and a dip extent of 60m (Wober and Shannon, 1985).

A felsic dyke was intersected at approximately the 1725m elevation on the footwall side of Fleece Fault in 8 diamond drill holes and in one drill hole (T84DH076) at the 1520m elevation on the hanging wall side of Fleece Fault. This dyke is typically porphyritic with quartz (eye) phenocrysts in a fine grained sericitic and locally chloritic matrix (Wober and Shannon, 1985). Fine grained dark sulphides also occur within the dyke. Assay values associated with this dyke range from very low to highly anomalous (<0.1 g/t Au to 66.2 g/t Au).

A second felsic dyke was in intersected on the hanging wall side on Fleece Fault between 1700m and 1750m elevation in 4 diamond drill holes. This dyke has been described in 1984 drill hole data as feldspar porphyritic in a fine grained chloritic and limonitic matrix and is moderately to highly sheared. These drill hole intersections do not have anomalous grade except for T84DH086 which reported 4.0 g/t Au and 0.3 g/t over 1.45m.

1991 Activities and Results

In 1991 the 31 diamond drill holes described above in Fleece A and Fleece B Zones were re-logged and the cross-sections between 25400N and 25940N were re-interpreted. Fleece Fault, Black Fault and Footwall of Tuff (FWT) fault are all continuous over the entire area.

Re-interpretation of cross sections through Fleece A Zone has not greatly altered the original interpretation of this area. The zone of mineralization is continuous over a 290m strike length and 130m dip extent. Mineralization is concentrated on the hanging wall side of Fleece Fault in the southern part of Fleece A zone. To the north, anomalous mineralization is associated with the FWT fault. At depth, below the point where the Fleece Fault and the FWT fault merge, the mineralization is concentrated on the footwall side of Fleece Fault. Several diamond drill holes (T84DH057, T84DH045, T83DH015) record weakly anomalous gold (3g/t to 7g/t Au) 10m to 35m due west of FWT fault. These intersections of anomalous grade vary from 4.00m to 9.32m core length and occur in footwall silicified dolomite that is brecciated and has stockworked calcite (+/-hematite,+/- limonite).

Mineralization associated with the Fleece Fault and FWT fault, as in Fleece A, is intersected again in Fleece B Zone at 25800N with assay values up to 28.1 g/t Au and 16.2 g/t Ag over 0.81m. No Fleece A style of mineralization is intersected north of 25875N where the carbonatized mafic volcanic wedge pinches out.

In the Fleece B Zone two different felsic dykes are intersected. On the hanging wall side of Fleece Fault a feldspar porphyritic dyke, 0.50m to 2.25m wide, appears to be subvertical and subparallel to Fleece Fault. The felsic dyke intersected in drill hole T84DH076 appears to be this same felsic dyke and not associated with the felsic dyke on the footwall side of Fleece Fault as originally interpreted. On the same section as T84DH076 this dyke is intersected two more times at the 1700m and 1750m elevation.

In Fleece B Zone the second felsic dyke, on the footwall side of Fleece Fault, is described as a quartz porphyritic felsic dyke with a 030° strike and dip of 29° west. This dyke is truncated by the FWT fault between 1700m and 1750m elevation. The width of this shallow dipping felsic dyke varies from 0.29m to 2.39m averaging at 1.12m width. Extremely high grade (up to 66.2 g/t Au) is associated with this felsic dyke but only where the dyke is within 30m of the FWT and Fleece Fault. Several anomalous grades (>3g/t Au) are intersected in silicified brecciated dolomite up to 30m in elevation above and as far as 70m elevation below this felsic dyke and in the footwall rocks of FWT Fault (Fig. 3.2.22). The best grade for this silicified brecciated dolomite is 17.6 g/t Au and 6.9 g/t Ag over 1.35m drill core length (T84DH077).

Conclusions

Previous regional scale mapping delineated three major north trending fault zones as well as a series of parallel, south plunging anticlines and synclines.

As diamond drilling has identified two mineralized zones in Fleece Bowl a 1:1000 grid should be established in order to facilitate structural mapping and further channel sampling. Grid mapping at this scale would allow greater control on the location of the main structures and geological contacts, both of which appear to control mineralization in Fleece Bowl.

Fleece Fault trench sampling reports low Au assay values (up to 1.6 g/t, 12.1 g/t Ag over 0.20m) within the fault structures. This does not concur with high Au assay values (up to 10.3 g/t Au,1.2 g/t Ag over 1.22m) reported in Fleece A Zone diamond drill sampling. Low anomalous grades (>3 g/t Au) off the main structures and predominantly within brecciated silicified carbonates are reported in both the trenches and diamond drilling. Most of this grade is 3m to 75m west of Fleece Fault. Extension and sampling of

these trenches from Fleece Fault and into the silicified carbonate on the headwall of Fleece Bowl is suggested.

Black Fault trench sampling reports elevated assay values of >10 g/t Au and 14.8 g/t Ag over 1.00m (FB-3) while diamond drilling reports no anomalous Au assay values in the Fleece Bowl area. Elevated Ag assay values up to 21.9 g\t Ag (FB-9) are reported in the north end of Fleece Bowl in Black Fault. Trench TT-10 should be resampled as only limited sampling is completed and four samples are unreported. FB-3 should be resampled to verify elevated assay values.

It is important to identify the mineralized felsic dyke of the Fleece B Zone on surface. Porphyritic "felsite" dyke float has been observed northeast of Fleece Bowl in the area where the mineralized felsic dyke is projected to outcrop (Lehrman and Caddey, 1989). Lehrman and Caddey (1989) also report that wire gold was panned off the east end of Chevron Minerals Ltd. trench TT-10 and there is coincident alteration zone of ankeritic and chloritic alteration (Fig. 3.2.21).

Fleece A Zone of mineralization is concentrated in the Fleece Fault and FWT fault structures. The strike extent of this zone is from 25420N to 25700N and between 1780m and 1680m elevation. Fleece A Zone is open to the south as only T84DH057 intersects Fleece Fault at the 1791m elevation. The area between Fleece A and Fleece B is also open as T84DH049 intersects Fleece Fault at 1740m (Fig. 3.2.22).

Re-evaluation of drill core data within Fleece Bowl has resulted in a new model for the mineralization within the carbonates in the Fleece B Zone. The highest concentration of gold is within the felsic dyke on the footwall side of and up to 30m west of Fleece Fault and Footwall of Tuff Fault. Low grade (3 to 7 g/t Au) extends at least 100m below this dyke at the 1725m elevation (Fig. 3.2.22). In the new model mineralization is considered to be more closely related to the Fleece Fault rather than the felsic dyke. A steeply east dipping zone of mineralization has been outlined (Fig. 3.2.22) in brecciated silicified dolomite footwall rock parallel to and between 5m and 35m west of Fleece Fault. Previously, the potential zone of mineralization was considered to be highly controlled by the felsic dyke/Fleece Fault intersection and west dipping, in which case, the mineralized zone had a limited dip extent and tonnage potential.

The low grade mineralization within silicified, brecciated or stockwork dolomite is believed to be a possible replacement style of mineralization along a weak structure parallel to Fleece Fault. Identification of this zone is difficult although there may be a different quality or quantity of silicification serving as a subtle identifier. This, or another defining characteristic of mineralization, should be closely investigated in the proposed 1992

diamond drill program.

A schematic cross-section (Fig. 3.2.22) illustrates the new model for mineralization in Fleece B Zone. In this model, mineralization extends along strike at least 140m (25780N to 25920N) and occurs between 1750m and 1625m elevation (open at depth). Limited zones of anomalous mineralization (penetrated in T84DH057, T84DH045 and T84DH015) also occur within Fleece A Zone on strike with Fleece B Zone. These zones are 20m to 30m horizontally west of Fleece Fault in Fleece B zone and should be investigated through 1992 diamond drilling in Fleece A Zone.

In Fleece B Zone diamond drilling should test the new model of mineralization to the north of section 25900N between 25920N and 26200N at the 1700m elevation. This zone should also be tested at depth below the 1650m elevation where it is currently intersected (Fig. 3.2.24).

Ore reserve tonnage calculations for the Fleece Bowl A and B zones resulted in an Inferred Mineral Resource of 415,335 tonnes @ 7.7g Au (McDonald, 1991).

The new interpretation is fully supported by all existing data and is particularly attractive in terms of its potential for tonnage expansion. Determination of the extent of mineralization through detail surface mapping, detail sampling, trenching and diamond drilling should be a focus of the 1992 exploration program.

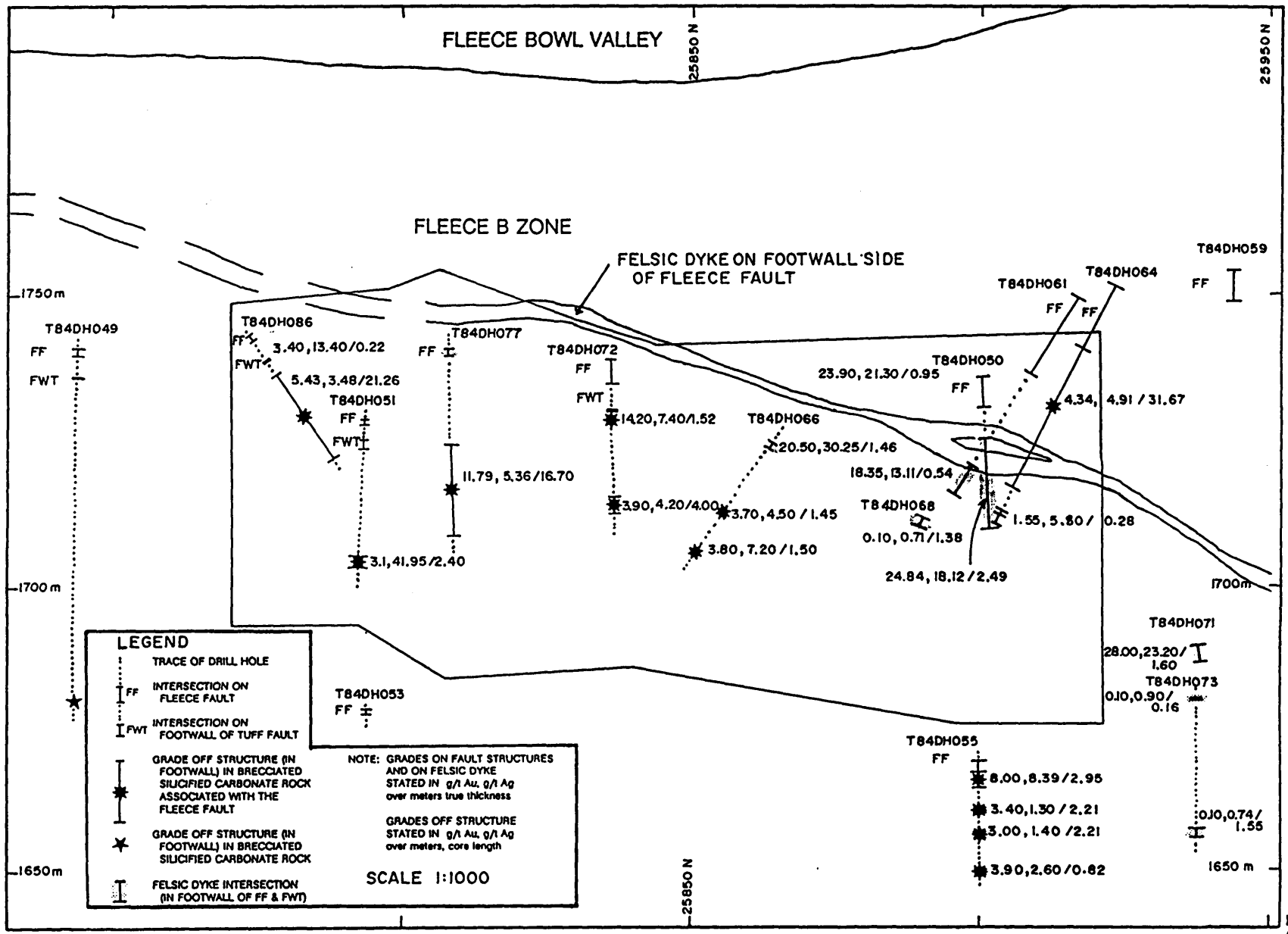


Figure 3.2.24 Composite longitudinal section of the Fleece B zone.

3.2.8 PROPERTY EXPLORATION - Preliminary Assessment Areas

Several reconnaissance traverses at 1 : 5,000 scale were conducted to give a preliminary assessment of areas with potential for an ore host structure. The areas visited were: (1) the New Open Pit Haul Road; (2) the Tangent Claims; and (3) Limestone Creek (Fig. 3.1.1).

A **new Open Pit Haul Road** was established this year to facilitate hauling ore from lower levels in the Open Pit. The 1.5 km long new road leaves the Old Haul Road at the 3.5 km mark and enters the pit at the 1440 m level.

The new Haul Road was mapped at 1 : 5,000 scale in August from the turn off at the Old Haul Road to Corsi's Creek (Fig. 3.1.1). Geologic contacts trend roughly perpendicular to the road. Mafic tuffaceous volcanic rocks that outcrop along the eastern portion of the road are in contact with an epiclastic sequence (argillite and carbonatized mafic volcanic rock) to the west. Minor shears within the epiclastic rocks trend north-northeast and north-northwest and dip steeply west and east respectively. Other minor shears in the epiclastic rocks trend northwest and dip moderately to the northeast. The argillite and carbonatized volcanic rocks are in contact with gabbro to the west. The contact is north-trending and is sheared. Carbonatized mafic volcanic rock was mapped adjacent to a northwest-trending, steeply northeast-dipping shear in Corsi's creek. The contact between gabbro and the carbonatized volcanic rock is not exposed. West of Corsi's Creek, unaltered pyroclastic mafic volcanic rocks are exposed.

A total of 38 rock samples of carbonatized mafic volcanic rock and minor quartz-calcite vein material were collected. The highest gold values reported for these samples are 0.31 g/t Au, 1.40 g/t Ag over 0.35 m and 0.21 g/t Au, 1.6 g/t Ag over 0.30 m.

The **TANGENT CLAIMS** (TANGENT 1, 2 and 3) were staked on the southeast corner of the Golden Bear property to cover possible southward extensions of the Ultramafic Fault and Ophir Break structures (Fig. 3.1.1 and section 2.2.1 this report).

No geological mapping was carried out while staking the claims, however seven samples were collected along claim lines. Samples taken were of quartz-chalcopyrite (± malachite) vein material and of carbonatized mafic volcanic rock. The highest assay reported for these samples is 0.62 g/t Au, 13.6 g/t Ag, 9700ppm Cu. This assay corresponds to a quartz vein bearing copper mineralization located on the east-west claim line dividing the TANGENT 2 and TANGENT 3 claims. A limonitic, pyritic quartz vein from the TANGENT 1 claim assayed 0.34 g/t Au, 1.2 g/t Ag.

One traverse was made along **Limestone Creek** in order to prospect and sample the carbonate-volcanic contact exposed in the creek on the northwest shores of Bearskin lake (Fig. 3.1.1). The creek coincides with the southern extension of the West Wall Fault which places mafic volcanic rocks on the eastern side of Limestone Creek against carbonate rocks to the west.

In 20 rock samples taken in mafic ash tuff, carbonatized mafic volcanic rock, quartz veins and dolomite, the highest assay results were 0.14 g/t Au, 1.4 g/t Ag and 0.10 g/t Au, 1.6 g/t Ag.

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APPENDIX A: 1990 EXPLORATION BUDGET

GOLDEN BEAR OPERATING COMPANY -- EXPLORATION EXPENDITURES AND PROJECTED BUDGET 1991

The surface exploration drill program totalled 14,334ft in 14 holes (7,363ft in 8 holes on Bear South and 6,971ft in 6 holes on Troy Ridge); the underground drill program totalled 1,994ft in 7 holes.

DATE OF ISSUE: December 10, 1991 (ALL FIGURES REPRESENTED AS $000'S):

	JAN	FEB	MARCH	APRIL	MAY	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC	TOTAL	
LABOUR (015)	18.625	15.753	14.310	17.425	41.365	41.790	44.875	40.220	29.315	17.955	14.120	9.825	305.578	25.57%
CLERICAL (045)	0.020	0.100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.120	0.01%
AIR SUPPORT (480)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	15.762	3.788	0.000	0.000	19.550	1.64%
SURFACE DRILLING (415)	0.000	0.000	0.000	0.000	9.589	4.847	238.807	19.853	284.624	0.000	-0.575	0.000	557.145	46.62%
U/G DRILLING (635)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.049	68.344	0.000	0.000	0.000	68.393	5.72%
ON-SITE ASSAYS (115)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	16.800	4.578	0.000	0.000	0.000	21.378	1.79%
OFF-SITE ASSAYS (260)	0.000	0.000	0.000	0.000	0.000	0.000	4.961	0.000	15.514	4.843	1.233	0.000	26.551	2.22%
CAMP COSTS (425)	0.000	0.000	0.000	0.000	1.890	8.982	5.080	9.992	13.121	0.108	0.000	0.000	39.173	3.28%
CONTRACTORS (135)	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*	*0.00%*
TRAVEL (215)	1.102	0.555	0.886	0.341	1.730	0.152	1.707	12.682	1.712	1.857	0.043	0.000	22.768	1.91%
VEHICLE/EQUIP EXPENSE (515)	0.000	0.000	0.000	0.000	0.000	3.143	3.177	3.455	3.387	3.066	0.000	0.000	16.228	1.36%
FIELD MATERIALS (420)	0.000	0.000	0.000	0.030	3.304	5.738	0.114	1.402	0.061	0.151	0.227	0.000	11.027	0.92%
GEOPHYSICS (470)	0.175	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.175	0.01%
DRAFTING (925)	3.313	2.707	1.952	0.785	0.727	0.920	0.388	0.260	1.457	1.685	0.591	2.000	16.786	1.40%
OFFICE SUPPLIES (245 &235)	0.274	0.000	0.051	0.000	0.285	0.000	0.171	0.460	0.194	0.768	0.170	0.250	2.623	0.22%
ROADS AND TRAILS (445)	0.000	0.000	0.000	0.000	0.000	0.000	3.605	7.465	0.000	2.303	0.000	0.000	13.373	1.12%
TRENCHING (465)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00%
INSURANCE (285)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00%
FEES (275)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.850	0.850	0.07%
U/G DEVELOPMENT (615)	0.000	0.000	0.000	0.000	0.000	0.000	20.006	4.059	7.943	0.000	0.000	0.000	32.008	2.68%
RENTALS AND LEASES (525)	0.100	0.000	0.000	0.000	0.000	0.000	1.850	2.623	2.289	0.529	0.100	0.100	7.591	0.64%
OFFICE RENTAL (265)	1.500	1.500	1.500	1.513	1.500	1.500	1.500	1.650	1.650	1.650	1.650	1.650	18.763	1.57%
CLAIM COSTS (325)	0.000	0.000	0.000	0.027	0.000	7.010	0.000	0.245	0.000	7.315	0.000	0.000	14.597	1.22%
COMMUNICATIONS (225)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.376	0.000	0.000	0.000	0.000	0.376	0.03%
MONTHLY TOTAL(estimated)	27.136	28.681	22.575	42.428	127.239	330.584	460.227	467.652	460.032	31.277	26.065	15.875		
MONTHLY TOTAL(actual)	25.109	20.615	18.699	20.121	60.390	74.082	326.241	121.591	449.951	46.019	17.560	14.675		
CUMMULATIVE TOTAL	25.109	45.724	64.423	84.544	144.934	219.016	545.257	666.848	1116.799	1162.818	1180.378	1195.053		

MONTHLY LABOUR REQUIREMENTS
GEOLOGISTS + ASSISTANTS

		REMARKS
JAN	2	Program preparation/hiring
FEB	3	Compilation/Field season preparation
MARCH	3	Compilation/Field season preparation
APRIL	4	Compilation/Field season preparation
MAY	7	Field season begins about May 7th
JUNE	9	Field season
JULY	9	Field season
AUG	9	Field season
SEPT	6	Field season
OCT	3	Office wrap-up/Report preparation
NOV	3	Office wrap-up/Report preparation
DEC	2	Office wrap-up/Report preparation

TOTAL EXPLORATION EXPENDITURE JAN - APRIL

84.544

TOTAL EXPLORATION EXPENDITURE MAY - SEPT

1032.255 (EXPLORATION SEASON)

TOTAL EXPLORATION EXPENDITURE OCT - DEC

78.254

Surface Diamond Drilling =$ 557.145

U/G Drilling and development =$ 100.401

Table A.0.1 Golden Bear joint venture deferred exploration subledger December 31, 1991.

APPENDIX B: 1991 DRILL HOLE SUMMARIES

1. 1991 BEAR SOUTH DIAMOND DRILL HOLE SUMMARIES

B91DH145: This hole consists mostly of mafic ash and lapilli tuff grading into, and interbedded with, epiclastic sediments and argillite. Carbonatized mafic volcanics are in contact with a dolomite and chert lens. The Bear Fault Zone mineralization occurs within chert adjacent to this contact. This carbonate+chert body is followed by a large fault zone, consisting of the Footwall Fault and Foster's Fault. A second carbonate lens occurs in the footwall of this fault zone. A homogeneous porphyritic mafic flow follows the second carbonate lens.

There are four significant intersections within this hole. The Bear Zone consists of a chert breccia that is locally sulphide rich at the volcanic/chert contact. This zone grades 4.53 g/t Au, 35.88 g/t Ag /2.75mtt. An interval of brecciated, sulphide-rich chert and pyritic gouge occurs within the carbonate/chert body and grades 2.01 g/t Au, 6.61 g/t Ag /1.27mtt. On the footwall side of the easternmost dolomite and chert lens is the Footwall Fault which grades 1.36 g/t Au, 1.56 g/t Ag /0.86mtt. Adjacent to the Footwall Fault is Foster's Fault which assayed 0.55 g/t Au, 0.56 g/t Ag /2.49mtt (Table 3.2.1).

B91DH146: This hole consisted mostly of mafic ash and lapilli tuffs that are carbonatized proximal to the Bear Fault. A pyritic gouge zone and silicified, brecciated chert were intersected probably at the fault contact between mafic volcanics and a carbonate-chert body. The hole was lost within the zone when the holed caved after the rods were pulled to change a bit. At 48.77m, a tricone bit broke off within this hole and drilling through the tricone resulted in an azimuth deviation of 35° from the designed azimuth.

The Bear Fault Zone intersection in this hole grades 0.99 g/t Au, 6.98 g/t Ag /3.43mtt and represents a minimum width. The highest grade within this zone was 6.93 g/t Au, 7.40 g/t Ag /0.30mtt (Table 3.2.1).

B91DH147: This hole consists of mafic lapilli tuff, ash tuff and some mafic flows that become increasingly interbedded with argillaceous sediment down the hole. Carbonatized mafic volcanic rock with interbedded argillite precedes the narrow fault gouge that is the Bear Fault structure. In this hole, the Bear Fault occurs before the contact of altered volcanics with chert. At the contact is a highly altered coarse grained dyke that is probably an end phase of a gabbro intrusive that has also been noted in

B91DH150. The carbonate+chert lens consists of chert and interbedded dolomite and contains a small fault zone that is similar to the Internal Sliver Fault. Silicified and brecciated dolomite at the end of the lens corresponds to the Footwall Fault. This structure has been intruded by a basalt dyke. Carbonatized mafic volcanics and relatively unaltered epiclastic sediment follow the Footwall Fault. Fault gouge and sheared carbonatized volcanic rock represents Foster's Fault. Carbonatized volcanics continue to the end of the hole.

Four faults were intersected in this hole. The Bear Fault graded trace g/t Au, 1.03 g/t Ag/0.56mtt. Composite grades for the Internal Sliver, Footwall and Foster's Fault are presented in the drill summary (Table 3.2.1). Within the carbonate+chert lens there was a zone grading 1.48 g/t Au, 5.37 g/t Ag/3.05mtt at the contact between chert and limestone. Crackle brecciated epiclastic sediments following the Footwall Fault graded 7.37 g/t Au, 5.20 g/t Ag/0.77mtt.

B91DH148: This hole consists of mafic lapilli tuff, ash tuff and mafic flows. A bed or possible lens of chert was encountered within carbonatized volcanic rock. The volcanics become increasingly altered towards the Bear Fault which comprises a silicified and pyritic chert breccia. Pyritic gouge of the Footwall Fault immediately followed the Bear Fault due to the absence of a carbonate+chert lens. The lens has pinched out at the intersection elevation. Variably altered and sheared epiclastic sediment and argillite follows the Footwall Fault. Foster's Fault is a zone of sheared epiclastic sediment and is followed by further gouge zones and a fault-bounded lens of limestone and chert. Beyond Foster's Fault carbonatized volcanics give way to relatively unaltered epiclastic sediment.

Carbonatized mafic volcanic rock preceding the Bear Fault structure grades up to 5.62 g/t Au, 1.0 g/t Ag/1.61mtt. The Bear Fault grades 0.39 g/t Au, 1.67 g/t Ag/5.28mtt. The Footwall Fault grades 0.21 g/t Au, 1.00 g/t Ag/0.33mtt and Foster's Fault grades 0.33 g/t Au, 1.16 g/t Ag/3.76mtt. A portion of a limestone lens that follows Foster's Fault has elevated silver values and grades 0.26 g/t Au, 4.16 g/t Ag/6.47m (core length) (Table 3.2.1).

B91DH149: This hole consists of mafic lapilli tuff, ash tuff and mafic flows grading into epiclastic and argillaceous sediments. Carbonatization increases as the carbonate contact is approached but there is no discernible fault structure at the contact of altered volcanics with dolomite. The carbonate+chert lens is comprised of dolomite and chert and is followed by the silicified chert breccia of the Footwall Fault. A basalt dyke intrudes the

latter fault structure. Variably carbonatized epiclastic sediment follows the Footwall Fault and precedes a fault gouge that represents Foster's Fault. A dolomite and chert lens follows Foster's Fault and may be within the fault structure. Carbonatized volcanics give way down the hole to epiclastic sediments and argillite.

Carbonatized mafic volcanic rock preceding the Bear Fault structure grades up to 3.02 g/t Au, 1.0 g/t Ag/0.50m (core length). The Bear Fault did not occur as a discernible structure. Dolomite within the main carbonate+chert lens graded up to 3.06 g/t Au, 5.69 g/t Ag/3.69mtt and had elevated grade over 13.44m that yielded a composite grade of 2.01 g/t Au, 4.06 g/t Ag/10.13mtt. Composite grades for the Footwall and Foster's Fault are tabulated in the Bear South diamond drill hole summary (Table 3.2.1).

B91DH150: This hole consists of mafic lapilli tuff, ash tuff, and flows that have been intruded by two gabbro dykes. These volcanics are followed by epiclastic sediments and argillite that has been cross-cut by three rhyolite dykes. The Bear Fault comprises pyritic tuff, gouge and brecciated chert at the contact of volcanics with chert. The carbonate+chert lens consists of chert and dolomite and contains two Internal Sliver-type fault structures that consist of pyritic, sheared tuff and brecciated chert. The Footwall Fault is a narrow fault structure of brecciated, pyritic dolomite on the footwall side of the carbonate body. The Footwall Fault is followed by carbonatized volcanics. Foster's Fault consists of a zone of gouge and sheared altered volcanics. Epiclastic sediments and mafic flows continue beyond Foster's Fault to the end of the hole.

The Bear Fault grades 0.30 g/t Au, 1.68 g/t Ag/2.19mtt. Brecciated dolomite within the carbonate+chert lens graded up to 1.43 g/t Au, 4.67 g/t Ag/0.98m (core length). Two Internal Sliver-type structures grade 0.28 g/t Au, 1.51 g/t Ag/0.65mtt and 0.17 g/t Au, 1.60 g/t Ag/0.46mtt. Composite grades for the Footwall and Foster's Fault are tabulated in the Bear South diamond drill hole summary (Table 3.2.1).

B91DH151a: Hole B91DH151 was abandoned due to excessive dip and azimuthal deviation of the pre-collar. Hole B91DH151a consists of mafic lapilli tuff followed by epiclastic sediment, argillite and hematitic mafic flows. The Bear Fault consists of pyritic, sheared tuff within the carbonatized zone of alteration prior to the contact of volcanics with dolomite. The lens is predominantly dolomite and chert and is followed by pyritic tuff of the Footwall Fault. A small length of altered volcanics separates the Footwall Fault from fault gouge of Foster's Fault. A slice of chert is

contained within Foster's Fault. Epiclastic sediment follows Foster's Fault to the end of the hole.

The Bear Fault grades 0.05 g/t Au, 3.08 g/t Ag/2.19mtt. The Footwall Fault grades 0.48 g/t Au, 2.0 g/t Ag/0.08mtt and Foster's Fault grades 0.24 g/t Au, 1.55 g/t Ag/4.75mtt.

B91DH152: This hole consists of mafic tuffs and flows that are interbedded with and grade into epiclastic sediment and argillite down the hole. The Bear Fault is comprised of sheared, pyritic chert, dolomite and carbonatized tuff at the contact between volcanic rock and dolomite. The carbonate lens is predominantly dolomite and is followed by a silicified, brecciated dolomite which corresponds to the Footwall Fault. Hematitic epiclastic sediment and mafic flows continue to the end of the hole.

The Bear Fault grades 0.05 g/t Au, 1.24 g/t Ag/2.08mtt and the Footwall Fault grades 0.14 g/t Au, 2.0 g/t Ag/0.14mtt (see Table 3.2.1).

2. 1991 BEAR NORTH (UNDERGROUND) DIAMOND DRILL HOLE SUMMARIES

B91UG097: The upper part of this hole consists of mafic flows and minor argillite. A carbonatized alteration zone in the volcanics precedes the pyritic gouge of the Bear Fault. The Bear Fault is followed by a lens of dolomite. Pyritic gouge and sheared tuff of the Internal Sliver Hanging Wall Fault follows the carbonate lens. Gouge and carbonatized mafic volcanics separate the Internal Sliver Hanging Wall Fault from the Internal Sliver Footwall Fault. The Internal Sliver Footwall Fault is an interval of pyritic fault gouge that precedes a lens of chert. The hole was abandoned within this second lens (Table 3.2.2).

Three faults were intersected in this hole. The Bear Fault graded 2.67 g/t Au, 5.60 g/t Ag/0.29mtt. The Internal Sliver Hanging Wall Fault has a composite grade of 6.03 g/t Au, 1.89 g/t Ag/2.77mtt and individual assays up to 13.82 g/t Au, 1.6 g/t Ag/0.30mtt. Using a 7 gram cut-off this structure grades 9.30 g/t Au, 1.40 g/t Ag/1.59mtt (8.66 g/t Au, 1.46 g/t Ag/1.80 minimum mining width). The Internal Sliver Footwall Fault yielded a composite grade of 1.94 g/t Au, 21.78 g/t Ag/1.55mtt. Almost all intervals from 49.60 to 66.45m grade between 1 and 3 grams.

B91UG098: This hole starts in mafic ash tuff and lapilli tuff that is locally carbonatized and increases in alteration intensity towards the Bear Fault. The Bear Fault consists of a fault gouge at the contact of altered volcanics and silicified brecciated dolomite. The thin lens of dolomite that follows the Bear Fault is immediately followed by pyritic sheared tuff of the Internal Sliver Hanging Wall Fault. Pyritic and carbonatized mafic volcanic rock separates the latter fault from the pyritic gouge and pyritic silicified brecciated chert of the Internal Sliver Footwall Fault. A second carbonate lens follows the Internal Sliver Footwall Fault and consists of dolomite and chert. Pyritic gouge and sheared tuff of the Footwall Fault follows the second carbonate lens. Mafic epiclastic sediments, argillite and minor argillaceous chert continues beyond this fault to the end of the hole.

Four faults were intersected in this hole. The Bear Fault grades 0.73 g/t Au, 1.17 g/t Ag/1.65mtt. Brecciated dolomite immediately after the Bear Fault grades 4.80 g/t Au, 2.60 g/t Ag/0.68mtt. The Internal Sliver Hanging Wall grades 0.14 g/t Au, 0.85 g/t Ag/1.41mtt. The Internal Sliver Footwall Fault has a composite grade of 3.96 g/t Au, 4.55 g/t Ag/2.43mtt and individual assays up to 8.95 g/t Au, 8.0 g/t Ag/0.72mtt. Using a 7 gram cut-off this structure yields 8.95 g/t Au, 8.0 g/t Ag/0.72mtt (5.36 g/t Au, 6.22 g/t Ag/1.80 minimum mining width). The Footwall Fault grades 6.86 g/t Au, 11.76 g/t Ag/3.06mtt with individual assays up

to 33.60 g/t Au, 52.6 g/t Ag/0.32mtt. A 7 gram cut-off yields 20.49 g/t Au, 21.39 g/t Ag/1.84mtt. Elevated assays extend from 74.60 to 92.33m and have a composite grade of 5.63 g/t Au, 11.38 g/t Ag/10.67mtt.

B91UG099: This hole consists of mafic ash tuff that is increasingly carbonatized as the Bear Fault is approached. The Bear Fault is a pyritic gouge and silicified chert breccia at the contact of volcanic rock with dolomite. The carbonate lens that follows the Bear Fault consists of dolomite and minor chert. The Internal Sliver Fault comprises a pyritic gouge and chert breccia that separates the first carbonate lens from a lens of chert breccia. The chert breccia is followed by pyritic gouge of the Footwall Fault. Mafic epiclastic sediments and carbonatized volcanics continue to the end of the hole.

Three faults were intersected in this hole. The Bear Fault graded 2.02 g/t Au, 3.59 g/t Ag/2.97mtt. The Internal Sliver Fault graded 7.03 g/t Au, 1.96 g/t Ag/5.05mtt. A 7 gram cut-off for this structure yields 10.77 g/t Au, 1.54 g/t Ag/2.45mtt. The Footwall Fault yielded a composite grade of 10.29 g/t Au, 9.0 g/t Ag/0.07 mtt (Table 3.2.2).

B91UG100: From 0.00 to 40.84m, this hole intersected mafic ash tuff and epiclastic sediment that is locally carbonatized. From 40.84 to 53.33m the volcanics are altered and an altered rhyolite(?) dyke was intersected from 44.65 to 44.93m. The Bear Fault consists of pyritic tuff and pyritic gouge from 53.33 to 54.35m. The carbonate lens consists of dolomite, chert and locally interbedded dolomite and chert from 54.35 to 83.34m. Two zones of silicification and brecciation, at 67.32 to 68.77m and 78.48 to 80.44m, within the carbonate may represent the Internal Sliver Fault. The Footwall Fault, from 83.34 to 86.40m, consists of silicified dolomite breccia, pyritic tuff, pyritic gouge and non-pyritic gouge. Argillite and carbonate altered mafic volcanic rock continues from 86.40 to the end of the hole at 101.80m.

Four faults were intersected in this hole. The Bear Fault graded 1.05 g/t Au, 2.22 g/t Ag/0.76mtt. The Internal Sliver Fault could be represented by either of the two faults intersected within the carbonate lens. The first fault graded 0.31 g/t Au, 1.2 g/t Ag/1.04mtt; the second fault graded 1.05 g/t Au, 5.90 g/t Ag/1.37mtt. The Footwall Fault yielded a composite grade of 1.39 g/t Au, 5.90 g/t Ag/1.94mtt with individual assays grading up to 4.80 g/t Au, 13.0 g/t Ag/0.45mtt.

B91UG101: This hole starts in mafic ash tuff which continues to 60.73m with only local alteration. Carbonate alteration of mafic volcanic rock from 60.73 to 66.45m precedes the Bear Fault. The Bear Fault extends from 66.45 to 72.39m and consists of pyritic tuff, gouge and pyritic silicified chert breccia. This intersection is above the point where the Bear Fault merges with the Internal Sliver Hanging Wall Fault. Altered mafic volcanic rock and pyritic tuff, from 72.39 to 78.93m, separates the Bear Fault from the Internal Sliver Footwall Fault. The combined Internal Sliver Fault and Footwall Fault extends from 78.93 to 80.60m and is composed of pyritic tuff, pyritic gouge and sulphide-rich chert breccia. Locally carbonate altered epiclastic sediment and mafic flows were intersected between 80.60 and 89.35m. Foster's Fault gouge continues from 89.35 to the end of the hole at 92.35 meters.

Two structures were intersected in this hole. The combined Bear Fault and Internal Sliver Hanging Wall Fault intersection graded 7.57 g/t Au, 4.11 g/t Ag/4.46mtt (7g grade was 11.17 g/t Au, 4.18 g/t Ag/2.61mtt). The combined Internal Sliver Footwall Fault and Footwall Fault intersection yielded a composite grade of 7.00 g/t Au, 4.59 g/t Ag/1.25mtt (7g grade 20.13 g/t Au, 7.40 g/t Ag/0.31mtt).

B91UG102: B91UG102 intersected mafic ash tuff and epiclastic sediment to 56.97m. These mafic volcanics are locally carbonatized and have minor zones of pyritization. Two small fault structures that were intersected at 36.61 to 37.25m and 43.06 to 43.61m consist of pyritic tuff and pyritic gouge respectively. The second fault zone probably represents the Cub Fault. The Bear Fault at 56.97 to 61.93m consists of pyritic tuff, pyritic gouge and chert breccia that is followed by dolomite and chert with interbedded dolomite from 61.93 to 80.80 m. The Internal Sliver Fault extends from 80.80 to 82.45m and consists of silicified chert breccia. Following the Internal Sliver Fault is silicified and locally brecciated dolomite from 82.45 to 88.08m. The Footwall Fault consists of pyritic gouge and altered mafic volcanics from 88.08 to 90.20 m. Altered volcanics and argillite continue from 90.20 to the end of the hole at 93.88 meters.

Four fault structures were intersected in hole B91UG102. The Cub Fault graded 1.89 g/t Au, 20.18 g/t Ag/0.39mtt. The Bear Fault yielded a composite grade of 0.93 g/t Au, 8.11 g/t Ag/3.13mtt. The Internal Sliver Fault graded 2.86 g/t Au, 5.64 g/t Ag/0.86mtt. The Footwall Fault has a composite grade of 3.54 g/t Au, 5.13 g/t Ag/0.64mtt and individual assays up to 9.19 g/t Au, 10.4 g/t Ag/0.76m.

B91UG103: This hole intersected mafic ash tuff from 0.00 to 48.84 m and is followed by altered volcanics from 48.84 to 53.50m. The Bear Fault consists of pyritic tuff and pyritic gouge from 53.50 to 59.70m. A narrow intersection of carbonatized mafic volcanic rock separates the Bear Fault from a fault structure interpreted to be the Internal Sliver Hanging Wall Fault. The latter fault is comprised of pyritic tuff from 60.26 to 62.48m. Altered mafic volcanic rock and pyritic tuff follows the Internal Sliver Fault from 62.48 to 66.34m. The combined Internal Sliver Footwall Fault and Footwall Fault intersection extends from 66.34 to 70.32m and consists of pyritic gouge and pyritic tuff. Mafic epiclastic sediment and argillite continue beyond 70.32m to the end of the hole at 80.77 meters.

Three fault structures were intersected in this hole. The Bear Fault composite grade is 6.56 g/t Au, 6.03 g/t Ag/4.51mtt and has a 7g grade of 14.61 g/t Au, 6.59 g/t Ag/0.99mtt. The Internal Sliver Hanging Wall Fault grades 2.85 g/t Au, 4.59 g/t Ag/1.61mtt. The combined Internal Sliver Footwall Fault and Footwall Fault grades 4.93 g/t Au, 5.18 g/t Ag/3.30mtt (7g grade is 8.43 g/t Au, 5.8 g/t Ag/0.72mtt). The grade between the Bear Fault and the Footwall Fault is sufficient that a composite grade from 53.50 to 70.32 m yielded 4.64 g/t Au, 4.59 g/t Ag/12.81mtt.

3. 1991 TROY RIDGE DIAMOND DRILL HOLE SUMMARIES

B91DH153: This hole consists of massive gabbro followed by carbonatized mafic volcanic rock, argillite and mafic epiclastic rock. Foster's Fault consists of a zone of gouge, silicified and quartz-stockworked argillite and pyritic gouge. This structure is followed by intensely carbonatized mafic volcanic rock. Mafic lapilli tuff and mafic flows (locally carbonatized), argillite, and mafic epiclastic rock occur between Foster's Fault and the West Wall Fault. Pyritic fault gouge of the West Wall Fault separates volcanic rock in the hanging wall from limestone, dolomite and chert in the footwall. A narrow zone of pyritic gouge occurs in the footwall carbonate rocks which continue to the end of the hole.

Two faults were intersected in this hole. Foster's Fault graded 0.06 g/t Au, 0.83 g/t Ag/0.69mtt. The West Wall Fault graded 0.12 g/t Au, 0.80 g/t Ag/0.54mtt. Sheared argillite in the hanging wall to the West Wall Fault had an anomalous assay of 1.03 g/t Au, 1.00 g/t Ag/0.50m. Pyritic gouge in the carbonate body beyond the West Wall Fault was also anomalous and graded 1.54 g/t Au, 1.00 g/t Ag/0.12m (Table 3.2.3).

B91DH154: This hole intersected 59.13 meters of overburden before intersecting gabbro bedrock. Gabbro is followed by mafic lapilli and ash tuff. Carbonatized mafic volcanic rock precedes the pyritic tuff and pyritic gouge that marks the Bear Fault. The Bear structure is followed by a carbonate lens consisting of dolomite with chert interbeds and clasts as well as an interval of sulphidized and brecciated chert. The carbonate lens is bisected by the Internal Sliver Fault which consists of pyritic gouge, silicified and brecciated chert and gouge. Locally pyrite-rich fault gouge at the end of the carbonate comprises the Footwall Fault. Foster's Fault is considered to have merged with the Footwall Fault in this hole. Mafic lapilli tuff, mafic flow, mafic epiclastic rock, argillite and one andesite dyke follow the Footwall Fault. Carbonatized mafic volcanic rock occurs in the hanging wall of the West Wall Fault which is represented by fault gouge. Dolomite, dolomite with chert interbeds and clasts and limestone occur in the footwall to the West Wall Fault and continue to the end of the hole.

Four faults were intersected in this hole. The Bear Fault had a composite grade of 1.71 g/t Au, 2.71 g/t Ag/1.24mtt (the highest grade on this structure was 8.50 g/t Au, 8.4 g/t Ag/0.11m). Assay results for the Internal Sliver Fault structure were as high as 10.29 g/t Au, 7.20 g/t Ag/0.12mtt. This structure graded 5.61 g/t Au, 6.13 g/t Ag/0.73mtt overall. The Footwall Fault graded 0.24 g/t Au, 1.40 g/t Ag/0.24mtt. Carbonatized mafic volcanic rock

following the Footwall Fault graded up to 1.54 g/t Au, 2.6 g/t Ag/0.20m and 1.34 g/t Au, 1.8 g/t Ag/0.60m. Assay results for the West Wall Fault are presented in the drill summary, Table 3.2.3.

B91DH155: This hole consists of massive gabbro followed by carbonatized mafic volcanic rock. Gouge precedes the Bear Fault which is expressed as a pyritic gouge zone. This is followed by barren (non-pyritic) gouge and then by pyritic gouge of the Internal Sliver Fault and the Footwall Fault which are interpreted to have merged in this location. No carbonate lens was encountered in this hole. Mafic epiclastic rock and carbonatized mafic volcanic rock occur between the Footwall Fault and Foster's Fault which is represented by a short gouge intersection. Mafic epiclastic rock, carbonatized mafic volcanic rock and argillite follow Foster's Fault. A narrow zone of fault gouge occurs at the contact of volcanic and carbonate rock. Chert, dolomite and limestone occur beyond this gouge and continue to the end of the hole. The West Wall Fault is represented by a narrow zone of silicified and brecciated chert just below the volcanic/carbonate contact.

Four faults were intersected in this hole. The Bear Fault graded 0.47 g/t Au, 1.29 g/t Ag/3.55mtt. The Internal Sliver Fault & Footwall Fault graded 0.37 g/t Au, 1.07 g/t Ag/5.88mtt. Foster's Fault graded 1.15 g/t Au, 2.20 g/t Ag/1.23mtt and the West Wall Fault graded 0.55 g/t Au, 2.60 g/t Ag/0.10mtt. Anomalous results were also received for epiclastic sediments (1.40 g/t Au, 1.00 g/t Ag/0.38m) and for carbonatized volcanic rock (1.30 g/t Au, 2.00 g/t Ag/1.00m) below Foster's Fault (Table 3.2.3).

B91DH156: This hole consists of gabbro followed by mafic ash and lapilli tuff. The volcanic rock is carbonatized at the gabbro/volcanic contact and also adjacent to the Bear Fault structure. The Bear Fault is expressed by pyritic tuff and gouge as well as by sulphidized and brecciated chert and dolomite. The Bear Fault is followed by dolomite, limestone, and dolomite with chert interbeds and clasts that constitute the eastern carbonate lens. The Internal Sliver Fault is expressed as a narrow zone of sulphidized and brecciated dolomite. A second carbonate lens follows the Internal Sliver Fault and consists of chert and variably silicified, brecciated and sulphidized dolomite. Carbonatized mafic volcanic rock and pyritic gouge of the Footwall Fault occur below this carbonate lens. Carbonatized mafic volcanic rock separates the Footwall Fault from the pyritic gouge of Foster's Fault. Mafic epiclastics, mafic lapilli tuff, mafic flows, carbonatized mafic volcanics and argillite follow Foster's Fault. Gouge at the volcanic/carbonate contact marks the position of the West Wall Fault. Limestone and dolomite continue beyond the

West Wall Fault to the end of the hole.

Five faults were intersected in this hole. The Bear Fault graded 0.12 g/t Au, 1.58 g/t Ag/2.22mtt. The Internal Sliver Fault graded 1.37 g/t Au, 5.60 g/t Ag/0.40mtt. The Footwall Fault intersection returned assays that indicated 1.60 g/t Au, 5.01 g/t Ag/2.21mtt. Foster's Fault graded 2.98 g/t Au, 2.00 g/t Ag/0.26mtt. A 3 gram cut-off grade applied to intervals in the immediate hanging wall to Foster's Fault indicated 3.02 g/t Au, 2.40 g/t Ag/0.83mtt. The West Wall Fault graded 0.27 g/t Au, 1.23 g/t Ag/1.18mtt. Several other anomalous results occurred off identified structures and are tabulated in the Troy Ridge Diamond Drill Hole Summary (Table 3.2.3).

B91DH157: B91DH157 intersected 46.23m of overburden above gabbro bedrock which was intersected to a depth of 139.94m. Interbedded mafic ash and lapilli tuffs below the gabbro continued to 274.32m. Volcanic rock from 274.32 to 286.58m is carbonate altered and followed by argillite to 291.95m. The Bear Fault structure (291.95 to 292.86m) is expressed as pyritic tuff and pyritic gouge and includes short (<0.20m) competent intervals of argillite. This structure is followed by a carbonate lens (292.86 to 334.15m) consisting of dolomite, dolomite with chert interbeds, and chert as well as minor gouge, argillite and carbonatized volcanic rock. This lens is structurally truncated by the Footwall Fault which is expressed across a relatively broad fault zone (334.15 to 341.72m) of pyritic carbonatized mafic volcanic rock, gouge, pyritic tuff and pyritic gouge. Carbonatized mafic volcanic rock and argillite occur in the footwall of this structure to a depth of 350.00m. The hole ends in mafic epiclastic rocks at 371.55m.

Two structures were intersected in this hole. The Bear Fault yielded grades of 0.18 g/t Au, 0.89 g/t Ag/0.62mtt. The Footwall Fault graded 1.37 g/t Au, 2.22 g/t Ag/4.73mtt. Other anomalous assays for this hole are listed in the Troy Ridge Diamond Drill Hole Summary (Table 3.2.3).

B91DH158: B91DH158 intersected rusty-weathering carbonatized mafic volcanic rock to 11.89m. Mafic epiclastic rock with minor mafic lapilli tuff occurs to a depth of 35.82m. Gouge, pyritic gouge and pyritic tuff as well as 2.01m of lost material occurs between 35.82 and 38.78m. This structure may represent Foster's Fault. Interbedded carbonatized mafic volcanic rock, dolomite and limestone with minor gouge intervals and frequent lost intervals occur from 38.78 to 56.35m. Mafic volcanic epiclastic and pyroclastic rock was intersected from 56.35 to 115.00m. Carbonatized mafic volcanic rock with minor argillite occurs in the hanging wall of the West Wall fault which occurs from 134.30 to

135.25m and is expressed by a folded argillite and rehealed breccia. Dolomite with chert interbeds and clasts, and limestone were intersected on the footwall side of the West Wall Fault and continue to the end of the hole at 162.46m. One structure was intersected in this hole. The West Wall Fault produced grades of 0.07 g/t Au, 2.00 g/t Ag/0.65mtt.

APPENDIX C: LIST AND SUMMARY OF 1990 TECHNICAL PAPERS ON THE GOLDEN BEAR MINE PROPERTY

(1) Golden Bear rock alteration study.
Consultant: J.L. Oliver
Author: J.L. Oliver

SUMMARY OF GOLDEN BEAR ROCK ALTERATION STUDY

An alteration study on the Golden bear minesite was initiated by J. Oliver to help gain a better understanding of the Bear deposit and to aid in further exploration in the area. A general summary of the study results follows.

Major Elements

Rock samples from the Bear Main Zone in the open pit have experienced both alkali and silica depletion relative to unaltered lithologies. There is very limited potassic enrichment and a profound sodium depletion (frequently Na <0.1%) around the open pit and in drill holes on section 23900N. Widespread silica depletion relative to the regional norm occurs in the rock in the open pit. There is no strong trend toward diminishing or increasing net silica contents, rather all rocks have lost 8-10% silica. Calcium and magnesium are less mobile than sodium, however these elements are notably depleted in the central part of the pit. This zone of low Ca + Mg content is flanked by high Ca + Mg contents towards the outer areas of the pit. Immobile elements, titanium and iron, are less abundant near the main ore zone. These changes are likely due to changes in the density of altered rock rather than any real net loss or gain of these elements.

Gold and Base Metals

Strongly pyritic mafic flows and fragmentals are modestly precious metal enriched (0.5 to 1.5 g/t) in the area of the main ore zone. Gold contents fall off prior to intersecting the main ore zone.

No base metal enrichment is associated with the gold mineralizing event. It is essentially a gold only deposit.

Selected Trace Elements

Trace elements, mercury, thallium, arsenic and antimony are all distributed in direct proportion to gold mineralization. Mercury and thallium are both strongly linked to both low and high grade gold zones in direct proportion to the strength of the gold mineralization. Low grade gold mineralization is associated with a 200 to 500ppb mercury halo and a 4 to 8ppm thallium halo. Where gold mineralization is strong, these values increase to greater than 1000ppb mercury and 59.9ppm thallium. These elements are discriminant between barren and gold bearing faults. The extremely low levels of mercury and thallium in the vicinity of Foster's Fault suggest that this structure may be post mineral.

The distribution of arsenic and antimony also closely follows gold mineralization, forming a bimodal pattern similar to that produced by many of the major elements and those trace elements associated with mineralization.

Stable Isotopes

Two samples were run for whole rock oxygen and hydrogen stable isotopes. One sample was taken from the Totem Silica Zone and the second from a mineralized chert in the open pit.

The isotopic signature of the cherts exposed in the Totem Silica Zone are indicative of a metamorphic fluid source. The isotopes are not a product of any intrusive related mineralizing system and they have not been influenced in any significant fashion by meteoric water.

The isotopic signature of the open pit sample has been strongly altered via rock-water buffering reactions. The reactions are most likely directly linked to the mineralizing event at Golden Bear.

Applications to Exploration

The results of this study can be applied to exploration strategies at Golden Bear Minesite. The conclusions made by Oliver, 1991, are:

1. The distribution of trace and major elements associated with mineralization are not significantly changed over a vertical distance 155 meters.

2. Alteration on the hanging wall side of the mineralized zone diminishes more rapidly than alteration in the footwall. This suggests that the hanging wall may not be in place.

   Regional structural features suggest that west-dipping antithetic structures may be present. Such structures would be difficult to detect from the current drill pattern and may truncate and displace ore. This hypothesis must be confirmed or rejected by further exploration.

3. Potentially mineralized structures may be targeted using the changes in distribution of elements. Typically productive fault systems are depleted in sodium and silica distally and show a bimodal enrichment/depletion in calcium and magnesium distally. Areas proximal to productive faults will show an increase in mercury, thallium, antimony, arsenic and gold. Alteration is considered a good exploration tool in the Golden Bear area

because the width of areas affected by alteration is in the tens of metres rather than the few metres commonly seen in epithermal deposits.

4. The absence of strong potassium enrichment and weakly developed sericite alteration assemblages draw into question some of the age data for this deposit. It is likely that some of the sericite is of early metamorphic origin. K-Ar dates based on these minerals may not be true ages of mineralization. Time of mineral emplacement is possibly late Cretaceous to lower Tertiary suggesting that greater attention to young structures may be warranted.

APPENDIX D: GOLDEN BEAR PROJECT PROPERTY LEGEND CODES MEMO AND UPDATES

Symbol	Description	To replace NAMC symbols
CAVE	CAVE - Material which has been recovered with an interval of core but which has fallen into the recovered position from higher up the hole.	
LOST	LOST CORE - An interval through which no recovery has been sustained.	
OVER	OVERBURDEN - core recovery through unconsolidated soil or transported material overlying bedrock.	
TRIC	TRICONED - Section of a hole drilled with a tricone bit therefore zero recovery obtained.	
BSDY	BASALT DYKE - Fine grained, dark green to black equigranular rock.	By
VNQZ	VEIN QUARTZ - Quartz vein of substantial size (ie. greater than 10cm)	
ANDY	ANDESITE DYKE - Fine grained dark green-grey intermediate volcanic. Contains up to 20% feldspar phenocrysts up to 2 mm across enclosed in an aphanitic ground mass.	
GOUG	FAULT GOUGE - Highly sheared, "punky", extremely soft clay material from an unidentifiable protolith. Assumed to be a sheared variant of wallrock lithology. Marks a fault plane. Not extensively pyritized but may contain minor fine sulphides. May be anomalous in gold and silver.	F, Ft
PGTF	PYRITIC TUFF GOUGE - Same original lithology as PYTF but entirely broken down to soft clay fault gouge by post mineral fault motion in the plane of mineralization. No original texture preserved. The gouge is dark-grey , locally limonitic	FTp, Fnf, Ft

	where affected by supergene water percolation from surface. Invariably anomalous in gold and silver. Commonly extremely high grade ore type, but grade is variable.	
PYTF	PYRITIC TUFF - Pyritic shear zone developed in mafic volcanic rocks. Rock is highly sheared, dark grey to black. It is silicified and competent, to clay-rich and soft. It contains abundant fine to medium grained sulphides, mainly pyrite. Invariably anomalous in gold and silver. Primary ore type.	Tp, Aq, Tp/Td
GBRO	GABBRO - Medium green, massive, porphyritic intrusive rock comprising 1 to 4 mm crystals of plagioclase and pyroxene.	G
DIDY	DIORITE DYKE - Dark grey, medium grained intrusive rock containing euhedral pyroxene and feldspar crystals up to 4mm across.	
MFTF	MAFIC VOLCANIC ROCK - Underground use only. Undifferentiated basaltic pyroclastic and flow rocks, generally massive to poorly bedded, minor interflow volcano-sedimentary rocks. Lithologies include mafic ash tuff, mafic lapilli tuff, and turbidites. All are dark grey to dark green in colour.	T
MFAS	MAFIC ASH TUFF - Basaltic pyroclastic rock comprised of at least 50% vitric and lithic less than 2mm across. Variants include crystal tuff where at least some of the clastic components include crystal fragments. Rock may be well bedded to poorly bedded and is typically dark green.	T
MFEP	MAFIC EPICLASTIC VOLCANIC ROCK - Dark grey to green clastic sedimentary rock formed through erosion and re-working of volcanic rocks of mafic composition Typically well bedded with normal grading of moderately sorted clasts.	

MFLP	MAFIC LAPILLI TUFF - Basaltic pyroclastic rock comprised of vitric and lithic clasts 2mm to 64mm across which occupy greater than 50% of the rock by volume. Rock may be massive or poorly bedded and is typically dark green	T
MFFL	MAFIC VOLCANIC FLOW - Basaltic volcanic flow rock. Typically dark green with plagioclase and pyroxene phenocrysts 2mm to 4 mm across of variable abundance. This rock is commonly massive in appearance but locally contains vesicles and may display pillow structures in outcrop.	T
MFCA	MAFIC VOLCANIC ROCK, CARBONATE ALTERED - Basaltic pyroclastic, flow and epiclastic rocks, bleached medium brown to light grey or cream coloured by carbonatization including development of silica, ankerite, dolomite, calcite, sericite, "green mica", and clay enrichment. May be extensively fractured or sheared and may be very soft. May contain up to 10% pyrite developed as patches, veinlets, and envelopes. Most commonly anomalous in gold and silver. Rarely ore grade.	Td, Tpd, Tp/Td
ARGI	ARGILLITE - Fine grained, dark grey to black, massive to finely bedded, pelitic rock which is commonly graphitic. Where tectonized may develop distinct graphitic slip planes.	A, Aq
CHSB	CHERT, SILICIFIED AND BRECCIATED Matrix supported, brecciated chert with angular chert and minor dolomite or silicified dolomite clasts in a light to medium grey matrix of secondary silica. Ankerite or carbonate matrix infilling is minor or absent. Clasts are rotated, and have been transported some distance there is commonly a heterogeneous component including minor tuff fragments. Clast composition is chert>>dolomite>mafic tuff. Trace	XQ, QX

sulphides may be present. May contain anomalous gold and silver grades. Locally ore grade.

CHXB CHERT, SILICIFIED, BRECCIATED, AND SULPHIDIZED - Matrix supported, brecciated chert with angular primary quartz and minor dolomite or silicified dolomite clasts in a dark grey matrix of secondary silica and fine grained sulphides. Ankeritic or carbonate matrix infilling is minor or absent. Clasts are rotated, and have been transported some distance there is commonly a heterogeneous component including up to 30% tuff and pyritic tuff fragments. Clast component is chert>>dolomite>mafic tuff. Commonly ore grade. — QX, Aq

CHRT CHERT - Massive to finely laminated, White to medium grey, cryptocrystalline primary quartz. May be interbedded with up to 20% limey particulate beds. May be crackled or form jigsaw breccias with a silica or ankeritic matrix where little or no fragment transport has occurred. May contain minor veinlets or replaced limey layers of silica with trace pyrite. May contain anomalous gold and silver. Locally ore grade (open pit). — Q, Aq, QA

DOSB DOLOMITE, SILICIFIED AND BRECCIATED Matrix supported, brecciated dolomite with angular primary chert and dolomite or silicified dolomite clasts in a light to medium grey matrix of secondary silica. Ankeritic or carbonate matrix is minor or absent. Clasts are rotated, and have been transported some distance there may be a heterogeneous component including minor tuff fragments. Clast component is dolomite>chert>mafic tuff. Trace sulphides may be present. May contain anomalous gold and silver grades. — XDq, XQ, QX

DOXB	DOLOMITE, SILICIFIED, BRECCIATED, AND SULPHIDIZED - Matrix supported, brecciated dolomite with angular primary chert and dolomite or silicified dolomite clasts in a dark grey matrix of secondary silica and fine grained sulphides. Clasts are rotated, and have been transported some distance there is commonly a heterogeneous component including up to 30% tuff and pyritic tuff fragments. Clast component is dolomite>chert>mafic tuff.Commonly anomalous gold and silver grades. May be ore grade.	QX, Aq
DOCH	DOLOMITE WITH CHERT INTERBEDS - Thick bedded to massive tan to light brown fine to medium grained dolomite with increased primary chert component as narrow discontinuous lenses, layers or beds. Primary chert component is greater than 20%. Chert occurs as medium grey to white massive to finely laminated layers or lenses (nodules) in the dolomite. No sulphides are present in this lithology unless silicified. Where tectonized, especially in the mine area, this rock is extensively fragmental with abundant, angular to rounded large fragments of chert (>20%) up to 8 cm across and smaller fragments of dolomite up to 3cm across in an ankeritic carbonate matrix.	Dq, XDq, XQ, QX
DOLO	DOLOMITE - Massive to thick bedded tan to light brown fine to medium grained dolomite. Contains up to 20% discontinuous primary chert layers which increase in size and extent up-section. Where tectonized, especially near Bear Fault and in mine area this rock appears extensively fragmental with angular to rounded dolomite and chert (<20%) fragments up to 5 cm across in an ankeritic carbonate matrix.	L, Dq, XDq

LMBC LIMESTONE, BANDED AND CRINOIDAL - Buff to tan coloured, thin bedded limestone locally containing crinoidal bioclastic debris or ankeritic debris.

LMST LIMESTONE - Massive or thick to medium bedded carbonate, white to pale grey in colour with local bioclastic debris or argillaceous components

UPDATES - The following units have been added to the property legend to accommodate rock units mapped by J. Oliver on a regional scale.

GRDI GRANODIORITE - Coarse to medium grained with hornblende as the chief mafic constituent. Biotite is usually present, and locally it is the predominant dark mineral. Plagioclase forms light grey, white or occasionally greenish subhedral crystals and is surrounded by anhedral grains of flesh coloured potassium feldspar. Clear, colourless or smoky quartz occurs as interstitial grains and subhedral crystals lining miarolitic cavities (Souther, 1971).

GRDF FOLIATED GRANODIORITE - Fine to medium grained diorite to quartz monzonite. Chlorite-altered hornblende is the most abundant mafic constituent. Feldspars are opaque, chalky white or tinted pink. Characteristically showing a strong mineral alignment, both foliation and lineation (Souther, 1971).

PHYL PHYLLITE - Fine-grained, dark, clastic sedimentary rocks with secondary fine-grained mica development forming a platy phyllitic texture and lustrous sheen. Typically intercalated with volcanic rocks which have been largely converted to greenstone and chlorite-amphibolite schist. Primary bedding and textural features are preserved (Souther, 1971).


MISTY MOUNTAIN
MISTY GLACIER
SAM CREEK GLACIER
SAM CREEK (1.3.2)
SAM CREEK
HIGHWAY CREEK (3.2.6)
HIGHWAY CREEK
ULTRAMAFIC FAULT
EIGHT MILE RIDGE
TOTEM (1.3.3)
KAISER RIDGE
STAN & OLLY CLAIMS
OPHIR BREAK STRUCTURES
FLEECE BOWL (3.2.7)
FLEECE CREEK (3.2.5)
FLEECE CREEK
GOLDEN BEAR MINE ACCESS ROAD
TROY RIDGE (3.2.8)
HELEN LAKE
OLD HAUL ROAD
OPEN PIT HAUL ROAD
BEAR NORTH (3.2.2)
BEARSKIN CREEK
MUSE RIDGE
ULTRAMAFIC FAULT
BEAR MAIN (OPEN PIT)
ZED ROAD
CAMP MILL
BEAR SOUTH (3.2.1)
LIMESTONE CREEK (3.2.8)
BEARSKIN LAKE
957m
TAILINGS POND
AIRSTRIP
CORE STORAGE AREA
MUSE RIDGE (3.2.4)
BEARSKIN CREEK
OPHIR BREAK STRUCTURES
AVALON CREEK
MUSE RIDGE
SAMOTUA RIVER
LONESOME LAKE
AVALON BOWL
Golden Bear Mine Claim Area
TANGENT CLAIMS (3.2.8)
GOLDEN BEAR MINE ACCESS ROAD
19000 E
21500 E
24000 E
26500 E
29000 E
31500 E
34000 E
30250 N
27750 N
25250 N
22750 N
20250 N
SYMBOLS
ROCK OUTCROP (defined, felsenmeer or talus)
LITHOLOGIC CONTACT (defined, inferred)
FAULT WITH RELATIVE MOVEMENT (defined,inferred)
THRUST FAULT
BEDDING (dip indicated, overturned)
FOLIATION (first, second phase)
BEDDING-CLEAVAGE, CLEAVAGE-CLEAVAGE, MINERAL LINEATION
ANTICLINE, SYNCLINE (deformational phase, plunge indicated)
OVERTURNED ANTICLINE, SYNCLINE (plunge indicated)
CLEAVAGE VERGENCE (oriented, neutral)
MINOR FOLD AXIS (trend, plunge, fold vergence indicated)
VEIN
JOINT
CLAIM POST
SURVEY STATION (permanent)
TRENCH, PORTAL, OPEN PIT
LAKE, MARSH
STREAM or CREEK (perennial, intermittent)
CONTOURS (metres)
CAT-TRAIL, ROAD, MAIN ROAD
LEGEND
AREAS OF 1991 EXPLORATION WORK
AREAS OF PROPOSED 1992 EXPLORATION WORK
Scale 1 : 25,000
0
2500
metres
GOLDEN BEAR OPERATING COMPANY LTD.
LOCATION MAP OF AREAS OF 1991 & 1992 WORK ON THE GOLDEN BEAR PROPERTY
Drawn By: DAM/KPD
Date: Dec.20, 1991
Figure No: 3.1.1
Map No:
Drawing No:
N.T.S.: 104K