82-#794 - #10793

GEOLOGICAL AND GEOPHYSICAL REPORT

CRYSTAL CREEK PROJECT PRO 6-13, WC 2-3

SUMMER 1982

for

COCHRANE OIL & GAS LTD.

&

BLUESKY MINING LTD.

GOLDEN B.C.

GEOLOGICAL BRANCH ASSESSMENT REPORT

10,793

82-K-14E,15W,15E

50° 55.5' 116° 57'

By:
Gary A. Nolin, P.Geol.
Trevor Dundas, P.Geoph.
Glen Harder, Geologist

Nov. 1982

PART 1 OF 2

LEGEND

LEGEND (CONT'D)

Accompanying Maps and Figures (Cont'd)

4C - North Pro Grid VLF Survey
4D - North Pro Grid Self Potential Survey
4E - North Pro Grid CEM Profiles
5A - Crystalline Creek Magnetic, Self Potential, Geology and Topography
5B - Crystalline Creek VLF Survey
6A - Vowell Creek Magnetic, Self Potential, Geology and Topography
6B - Vowell Creek VLF Survey
7A - Adit Grid Geology and Topography
7B - Adit Grid Magnetic Survey
7C - Adit Grid VLF Survey
7D - Adit Grid Self Potential Survey
8 - Crystal Creek Property Land Holdings Map

CERTIFICATE OF QUALIFICATION

I, Gary A. Nolin, Professional Geologist in the City of Calgary, in the Province of Alberta, hereby certify:

1. THAT I am a Registered Professional Geologist in the Province of Alberta and reside at 68 Woodborough Crescent S.W., Calgary, Alberta.

2. THAT I am a graduate with a Bachelor's degree in Geology from Western Washington State University in Bellingham, Washington and that I have practised in this profession for a period of ten (10) years.

3. THAT I am familiar with and have physically exaimined this property on numerous occassions as a consequence of directing this program as well as the overall program conducted in 1981.

4. THAT I have not, nor expect to receive any interest in this property.

5. THAT to the best of my knowledge, all available data pertinent to this property was examined during the preparation of this report.

6. THAT all data acquired as a result of the surveys conducted on the property was acquired in a professional and respectable manner.

GARY A. NOLIN, P. Geol.

CERTIFICATE OF QUALIFICATION

I, Trevor R.B. Dundas, Professional Geophysicist in the City of Calgary, in the Province of Alberta, hereby certify:

1. THAT I am a Registered Professional Geophysicist in the Province of Alberta and reside at 68 Brampton Crescent S.W., Calgary, Alberta.

2. THAT I am a graduate with a Master's degree in Geophysics from Imperial College, University of London, England and that I have practised in this profession for a period of fifteen (15) years.

3. THAT I have conducted and supervised geophysical surveys on this property during June - September 1981.

4. THAT I have not, nor expect to receive any interest in this property.

5. THAT to the best of my knowledge, all available data pertinent to this property was examined during the preparation of this report.

6. THAT all geophysical data acquired as a result of the surveys conducted on the property was acquired in a professional and respectable manner.

TREVOR R.B. DUNDAS, P. Geoph.

CERTIFICATE OF QUALIFICATION

I, D. Glenn Harder, of Deep River, in the Province of Ontario, do hereby declare:

1. THAT I am a geologist with a Bachelor of Science Degree (Honors) in Geology from the University of Ottawa and a Bachelor of Arts Degree in Arts and Science from the Queen's University.

2. THAT I have worked in the mineral exploration business over a period of fifteen years including seven years as a geologist.

3. THAT I have been working as an independent contractor and consultant since 1976.

4. THAT I performed on-site supervision of the geophysical and geologic studies in this report.

5. THAT I have not, nor expect to receive any interest in the subject claims.

6. THAT all data in this report was acquired in a professional and respectable manner.

D. Glenn Harder

D. GLENN HARDER, B.A.,B.Sc.

I SUMMARY AND RECOMMENDATIONS

The 1982 exploration program conducted by Nolin Geo Enterprises consisted of geologic mapping S.P., I.P., MAG, VLF-EM, CEM, MAX-MIN EM and altimeter studies.

The program consisted of two parts. Part I was conducted in early June 1982 and covered COG 12. Field work for Part II took place during the month of July 1982 and covered seven separate target areas including a pilot study over the Ruth Vermont mine.

The areas covered by the 1982 program included over 90km of line, considering each type of geophysical survey as separate.

The program served to locate new areas of mineralization, to locate and define several major anomalies as well as the information to help develop a geological/geophysical exploration model. The SP seems to give the best response to mineralization in the area. A general program of trenching and drilling as well as additional geophysical grids are recommended for the 1983 program.

II INTRODUCTION

The Crystal Creek Project was acquired through an option agreement dated August 5, 1981 between Bluesky Mining Ltd. and Cochrane Oil and Gas Ltd. Bluesky was the operator for the 1981 exploration program and has returned the operatorship back to Cochrane for the 1982 program. Cochrane contracted Nolin Geo Enterprises Ltd. to conduct the 1982 exploration program.

The 1982 field program was divided into two parts, Part I was conducted between June 4 and June 13, 1982 and is covered in a previously submitted report. Part II of the field program was conducted between July 4 and July 28, 1982.

The program was to cover geochemical anomalies obtained in 1982 over three grids, (1) Tect, (2) North Pro, (3) Warren Creek. In order to establish what geophysical methods and parameters should be used, it was arranged to do initial test work over the base metal deposit of the Ruth Vermont mine. This deposit adjoins the Tect and North Pro claims and is on strike with mineralization discovered on the Tect claims. Geophysical methods and parameters were determined during the test work but the results obtained over the mine were not as definitive as expected and raised some interesting questions about the ore deposits in the Ruth Vermont area.

The anomalies near the Ruth Vermont mine are to be considered to be of maximum priority, not because of amplitude but because this area has been used to produce the basic theory of mineralization for the whole region. Any additional discovery of additional ore bodies at this location would have considerable effect on theories of ore formation.

During the survey work over the grids, various theories were advanced concerning the genesis of the ore deposits based both on the geophysical results and geological mapping. Some of these were tested with small survey grids.

II INTRODUCTION (CONT'D)

The final survey grids covered have been identified as follows:

(1) Ruth Vermont test area
(2) Tect claims
(3) Warren Creek
(4) North Pro
(5) Crystalline Creek
(6) Vowell Creek
(7) Adit

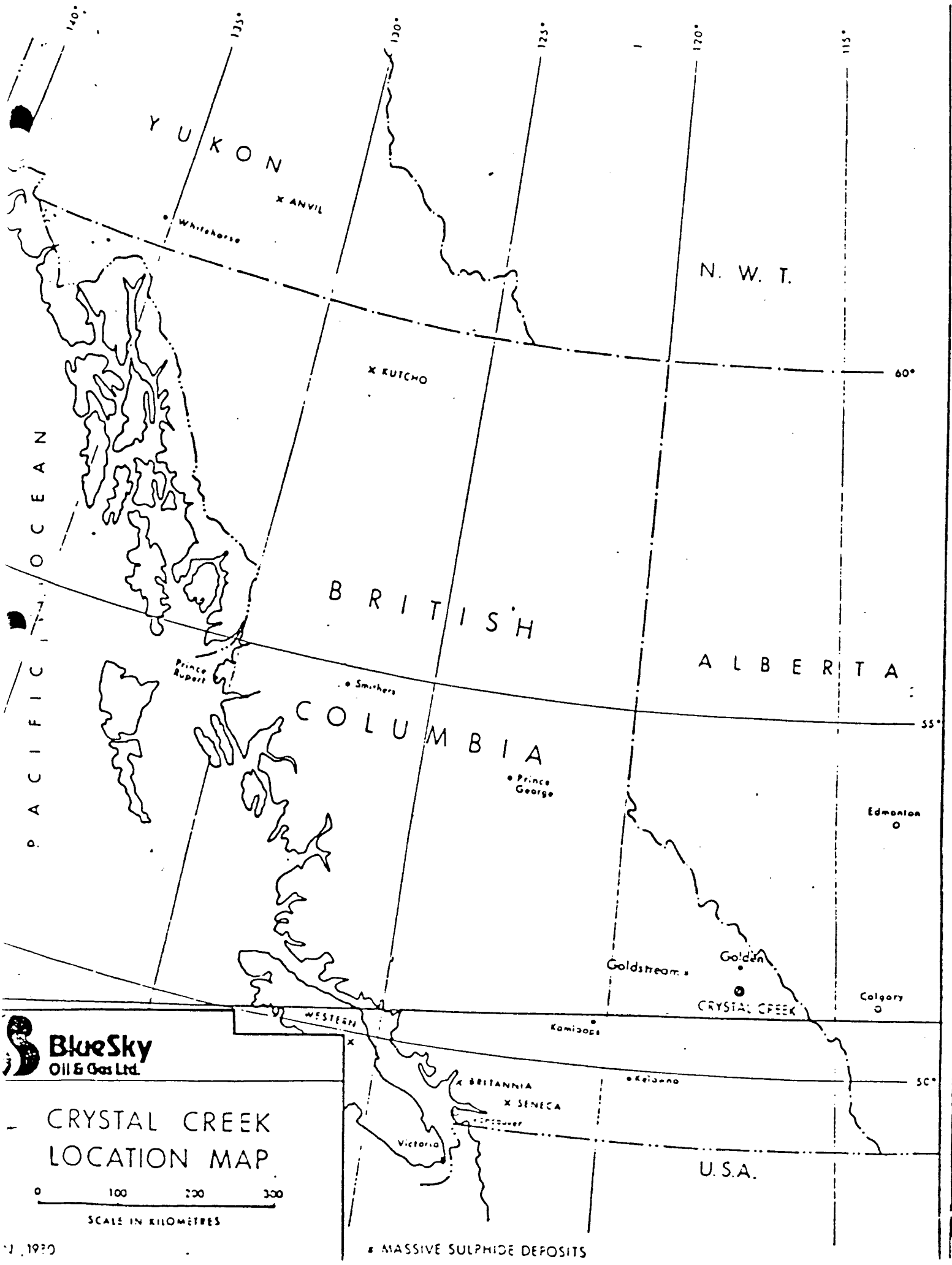
III LOCATION AND ACCESS

The Crystal Creek Project centres on an area located in the Purcell Mountains approximately 40 kilometers south of the town of Golden, British Columbia. The project area lies within the Golden Mining Division of N.T.S. sheets 82-K-14E, 15W, 15E.

Access to the property is provided by Provincial Highway 95 south from Golden to Parson, followed by 51 kilometers (32 miles) along a gravelled logging road which traverses the main block of claims. Several abandoned logging roads and cat trails also traverses the area and can be travelled by 4-Wheel Drive vehicles.

Rail services would likely be available on the Canadian Pacific line that the main logging road intersects at Parson, British Columbia.

The topography varies from approximately 1,200 meters above sea level at the creek beds of Vowell, Crystalline, Conrad and Warren Creeks, to approximately 2,700 meters above sea level at the peaks of Azurite and Vermont Mountains.


140°
135°
130°
125°
120°
115°
YUKON
ANVIL
Whitehorse
N. W. T.
60°
KUTCHO
PACIFIC OCEAN
BRITISH COLUMBIA
ALBERTA
Prince Rupert
Smithers
55°
Prince George
Edmonton
Goldstream
Golden
CRYSTAL CREEK
Calgary
WESTERN
Kamloops
Kelowna
50°
BRITANNIA
SENECA
Victoria
U.S.A.
BlueSky
Oil & Gas Ltd.
CRYSTAL CREEK
LOCATION MAP
0
100
200
300
SCALE IN KILOMETRES
MASSIVE SULPHIDE DEPOSITS

LEGEND
PAVED HIGHWAY
GRAVEL LOGGING ROAD
C.P. RAIL LINE
RIVER / CREEK
NORCEN LAND HOLDINGS
Nicholson
Kicking Horse River
COLUMBIA RIVER
North Fork
Parson
Bobbie Burns Creek
Malachite Cr.
51°00'N
117°00'W
RUTH-VERMONT MINE SITE
Vermont Cr.
Crystal Cr.
South Fork
Bobbie Burns Creek
Warren Creek
Crystalline Cr.
Conrade Cr.
Morrell Creek
Molloy Cr.
BlueSky Oil & Gas Ltd.
(COCHRANE OIL & GAS OPTION)
CRYSTAL CREEK PROJECT
BRITISH COLUMBIA
LOCATION MAP
0 5 10 Km.
SCALE 1:250,000
N.T.S. 82 K-14 E, 82-K-15 W, 82-K 15 E

IV HISTORY

Mining exploration in the Crystal Creek area dates back to the late 19th Century. Showings were first reported in the Crystal and Vermont valleys. The latter developed into a deposit (Ruth Vermont Mine) and has been sporadically produced since 1898.

The showings on the north side of Crystal Creek were first reported in 1890, these and other showings were located and staked by Mr. R. Renn in 1965.

The property was optioned to Purcell Range Mines Ltd. who completed bulldozer stripping with little success. Ownership of the claims was transferred to Medesto Exploration Ltd. in 1967. They completed a limited amount of trenching and two short diamond drill holes. A soil geochemistry survey and eighty meters of diamond drilling were reported in 1974. In 1978, Medesto became Cochrane Oil & Gas Ltd. Cochrane completed more soil geochemistry surveying, trenching and diamond drilling. The property also covers a copper showing near Warren Creek. This showing was originally discovered in the 1920's and was partially explored by two small tunnels. In 1960 and 1961, airborne and ground geophysics and 1,100 meters of diamond drilling, with several good shows, were completed for St. Andrews Mining Co. Further electro-magnetic surveying, trenching and 700 meters of diamond was done in 1968. In 1972 and 1973, geological, soil geochemical and self potential surveys were carried out for the Caroline Mines Ltd.

Norcen Energy Resources acquired the Crystal Creek property from Cochrane Oil & Gas Ltd. under an option agreement dated August 14, 1979. Work carried out by Norcen in 1979 was restricted mainly to a gridded area which included the showings north of Crystal Creek. The 1979 exploration included geological mapping, soil geochemical surveying, electromagentic surveying and the diamond drilling of twelve holes totalling 763 meters. The 1980 Norcen program was similar to 1979 with 530.03 meters of diamond drilling.

IV HISTORY (CONT'D)

Norcen concluded that most geochemical anomalous areas were found to be coincidental with axial plane traces of major folds which have acted to localize mineralization. They believed that for their economics they had discovered no significant mineralization and that most mineralization was related to quartz veins. Norcen allowed their option with Cochrane Oil & Gas Ltd. to terminate.

Under an agreement dated August 5, 1981, between Bluesky Mining Ltd. and Cochrane Oil & Gas Ltd., Bluesky obtained the Crystal Creek property.

In the summer of 1981, Bluesky undertook a program of extensive geochemical sampling, and geological mapping and evaluation. They also drilled 440 meters. The 1981 program encountered several areas of mineralization and was used in designing an ongoing program for 1982.

V Land Status

The following claims staked under the Modified Grid System were acquired from Cochrane Oil and Gas Ltd. by option under the terms of the August 5,1981 agreement.

Claim Name	Record Number	Expiry Date
Pro 1	429	September 28, 1985
Pro 6	430	September 28, 1984
Pro 7	431	September 28, 1984
Pro 8	432	September 28, 1984
Pro 9	433	September 28, 1984
Pro 10	434	September 28, 1984
Pro 11	435	September 28, 1984
Pro 12	436	September 28, 1983
Pro 13	437	September 28, 1983
Tect 1	410	September 14, 1987
Tect 2	411	September 14, 1987
Tect 3	412	September 14, 1990
Tect 4	413	September 14, 1987
No One L542	406	September 07, 1984
Diamonde L543	407	September 07, 1984
Monitor L651	408	September 07, 1985
Cog 5	324	June 18, 1986
Cog 7	326	June 18, 1987
Cog 14	333	June 18, 1990
Cog 15	334	June 18, 1987
Cog 6	325	June 18, 1986
Cog 8	327	June 18, 1986
Cog 10	329	June 18, 1986
Cog 12	331	June 18, 1982 (work pending)
Cog 13	332	June 18, 1984
WC 2	307	June 18, 1985
WC 3	308	June 18, 1985
WC 4	309	June 18, 1985
Cog 4	323	June 18, 1990
Cog 1	320	June 18, 1987
Cog 2	321	June 18, 1987
Cog 3	322	June 18, 1987

VI GEOLOGY

The Crystal Creek Project lies within an area underlain by Proterozoic Windermere rock of the Horsethief Creek Group. J.E. Ressor of the Geological Survey of Canada mapped the Lardeau area (within which is the Crystal Creek Property) on a scale of 1:250,000 (approximately 1 inch to 4 miles).

Ressor described the Horsethief Creek Group as a "thick sequence (3,000 to 8,000 Feet) of slate, argillite and phyllite as well as lesser amounts of quartzite, greywacke and limestone. In addition, it contains considerable thicknesses of quartz pebble conglomerate and pebbly grit".

In general, the lower part of the Horsethief Creek consists dominately of argillite and slate with some limestone. The middle part is characterized by quartzite, grit and pebble conglomerate along with the slate and phyllite. The upper portion is predominatly purple and red slate and siltstone with minor limestone.

The regional metamorphic grade of the Horsethief Creek within the Crystal Creek Project area is lower to middle greenschist facies. The level of metamorphism increases southward as the Bugaboo intusive is approached. Locally contact metamorphism superimposed on the regional metamorphism has locally given rise to lower almandine-amphibolite facies.

The mesozoic structure patterns within the Crystal Creek Project area are dominated by the Purcell anticlinorium. The Purcell anticlinorium is essentially a very complicated belt consisting of open folds in successions of relatively competent strata and more complex tighter folds in less competent, thinner bedded sections. The structural picture is often further disturbed by local faulting.

VI GEOLOGY (CONT'D)

Local Geology

The former reports and maps on the property, predominately those of Norcen and Cochrane Resources, Nolin's geological reports and maps for Bluesky, area reports, as well as the grid controlled mapping and geological traverses were utilized in formulating a preliminary geological description and interpretation of the property.

Lithology

Several rock types were identified including a variety of argillites, phyllites, limestone, arkose, quartzite, grits, and quartz pebble conglomerates. A brief description of each is given below:

1. Argillite (and its foliated equivalent phyllite) is the predominat rock type located on the grid. Several variations are present ranging from light grey to near black in color, and from massive and structureless to thinly laminated, bedded, and sometimes varved varieties. The darker colored argillites frequently contain pyrite or marcasite crystals. The many varieties are commonly interbedded and may not be calcareous. Soft sediment and structural deformation is often visible in the laminated and bedded varieties.

2. Limestone is not abundant on the property. Typically the limestone is dark colored, fine grianed, impure and interbedded with thin beds of argillite. In several areas, calcareous arkosic or sandy layers were identified and these may represent an impure coarse variety of the limestone.

   A unique calcareous unit was located in the eastern portion of the grid. The rock appears to contain oolites or pisolites as well as angular clasts of a variety of rock types common to the local area. The current interpretation is that this represents slump brecciation within a shallow water environment. This carbonate breccia has a thickness of 3 to 5 meters (perhaps locally up to 10 meters) and represents a marker horizon that may assist in the unravelling of the stratigraphy on the Crystal Creek property.

VI GEOLOGY (CONT'D)

Lithology (Cont'd)

3. Quartzite, Arkose, Grits, and Pebble Conglomerates - rocks of varying clastic composition ranging in grain size up to 10mm are found on the Crystal Creek grid area. For the most part the clastic rocks are light grey and green colored although dark brown and dark grey varieties are present. The coarser varieties are dotted with white and blue quartz clasts. Several arkosic and gritty sections are calcareous.

The western and southern portion of the grid area is primarily underlain by clastic rocks. Although outcrop exposures are limited, the clastic section would appear to be several tens perhaps hundreds of meters thick with interbeds of argillite (phyllite).

Most of the particles consist of quartz which may occur as aggregates of grains as in the quartz pebble conglomerates. The pebbles in the conglomerates are predominantly of quartz, although feldspar, chert, quartzite dolmite, and argillite pebbles are recognizable. The coarse (up to 50mm) pebble conglomerates were not seen on the grid area however several outcrops are visible along the main access logging roads to the east.

In the southern Tect claims grid area, thick sequences (in excess of 35 meters) of quartzite and pebbly grit was intersected at the bottom of drill hole 79-11. The quartzite and pebbly grits were highly altered by sericitization and contained a high percentage of disseminated pyrite and arsenopyrite (up to 15% disseminated sulphides in places).

Stratigraphy and Structure

One limestone bed, on the order of 30 meters thick was traceable over several kilometers in the western portion of the property. Although

VI GEOLOGY (CONT'D)

Stratigraphy and Structure (Cont'd)

this limestone is volumetricly insignificant within the section it appears to mark a very sharp change in the depositional regime during Horsethief Creek time. Below the limestone, the sediments are dominated by relatively coarse grained clastics such as arenites and conglomerates, occurring in fining upward cycles of various thicknesses.

Overlying the limestone are thick sequences of predominately greywacke with subordinate arenite and shale. All are fine grained and reflect an increase in the amount of clay being supplied to the area. Graded bedding and fining upward sequences are common. Higher in the section black shales become more common, as opposed to the grey and green shales lower down.

Certain of the shale horizons have a varved appearance suggestive of differential settling of a suspended sediment load. These are features of deep water deposition. Hence, it would appear that after the deposition of the limestone, the area experienced extensive transgression creating the deep water sediments observed in the western portion of the property.

The major fold on the property is an anticlinorium whose axis, or more precisely, axial area, runs through the Ruth Vermont Mines deposit and through the showings on the north side of Crystal Crrek. This fold is well exposed on the north and south sides of the Vermont Creek and it was found that, while structure was easily definable within the flanks, the central or axial area was highly foliated and contorted. This zone was some 1.5 kilometers wide. Along the strike, this zone is largely obscured by the overburden within Vowell Creek but may be recognized in isolated outcrops by an associated strong foliation. Such a major anticlinorium should have adjacent synclinoria. The one to the southwest was not observed, being out of the area of interest. The

Stratigraphy and Structure (Cont'd)

one to the northeast is within the property boundaries but is not documented. It would appear that the axial area of the syclinorium passes through the vicinity of the Warren Creek shouldings. A limestone bed outcrops in that area which may be correlatable with the one previously mentioned as no other limestone was observed to the west. If such is the case it would mark the exposure of younger rocks in the trough of the syclinorium.

The secondary folds in the limbs of these major structures are generally parallel and upright. The wavelength of these folds appears to be on the order of 0.5 kilometers. They are seen to plunge either north or south or to have horizontal axes. It was observed in the western portion of the property that some anticlines die out to the north by changing along strike from anticlines to structureal teraces. At those points the folds had a gently northerly plunge.

Fracturing was observed in most folds parallel to the axial planes. These fractures seem to have localized quartz veining which in turn is often accompanied by sulphide mineralization. It was also observed that anticlinal axial planes were often highly altered and hematized.

VII 1982 PROGRAM

I RUTH VERMONT TEST GRID (Figures 1A, 1B, 1C)

Geology

The rocks of the Ruth Vermont area are of the Proterozoic Horsethief Creek Group. Included are phyllites, slates, quartzites, grits, pebble conglomerates and limestone. The phyllites in the vicinity of the mines are pyrite-bearing, resulting in a overall rusty appearance in the weathered cliffs above the mine site. Beds are thin and often crossed by cleavage.

The major structural element is a major asymmetric anticline trending northwest, plunging gently to the southeast. The axial plane dips steeply to the northeast. Three smaller folds occur within the hinge zone of the major anticline, the Charlotte anticline, the Sheba anticline and the Ruth syncline.

Mineralization is associated with limestone within the Ruth syncline. The Ruth synclinal axis plunges 5^{O} towards an azimuth of 135^{O}. and the axial plane dips 75^{O} to the northeast. Most of the mining was concentrated on the southwest limb.

Two sets of quartz veins occur, one barren and one sulphide bearing. The barren veins run perpendicular to the axis of the Ruth syncline. The mineralized veins trend 110 - 115 degrees and dip moderatly to steeply south. They contain argentiferous galena, spholerite, pyrite and arsenopyrite and small amounts of chalcopyrite boulangerite, tetrahedrite, scheelite and carbonates.

The mineralized veins transect the folds and the clearage and are richer in sulphides just under the limestone. The vein sulphides are coarse while the replacement ore in the limestone is fine grained.

VII 1982 PROGRAM (CONT'D)

Geology (Cont'd)

The ore zone trends 130° and dips southwest. The en echelon veins and fractures strike 112 degrees and dip 50 degrees or more to the south, transecting the cleavage and oblique to the trend of the Ruth syncline. The limestone on the southwestern limb controlled the fracturing and probably aided the precipitation of the sulphides.

In 1982, an orientation study was conducted which included over 2 kilometers of geophysics in the vicinity of Ruth Vermont mineralization and extended 500 meters into COG 2.

Of interest are SP anomalies at two sites on Line 3, one in the vicinity of 400 North (anomaly A) and the other at 825 North (anomaly C). At both sites quartz veining and alteration was seen in outcrop. Also, quartz pebbles with galena were seen in the talus at both sites. The mineralization appears to be associated with altered phyllites, arkose and graphitic argillite with quartz veins associated with regional and local shears. and fractures.

In some respects the altered arkose resembles a sheared, altered porphyry. Whether this rock was originally an arkose or porphyriz, a nearby buried heat source is likely, possible a buried batholith similar tc the Bugaboo intrusive. The presence of alteration including sericite schist and quartz veining support this hypothesis.

Geophysics

The site of the Ruth Vermont mine was used as the test area and the location of the survey lines is shown in Figure 1A. The mine was not in operation during the survey and the only interference

VII 1982 PROGRAM (CONT'D)

Geophysics (Cont'd)

to the test work was from the surface building materials.

The premise was that the ore body that was being worked at the mine could be used as the "type" target for all other exploration in the vicinity and that the response obtained over this target could be used as the standard.

The results of the various geophysical methods produced some unexpected response and raised some interesting questions concerning the Ruth Vermont ore deposit. The results of the survey are discussed according to method as follows:

(A) Magnetic Survey

The results for most of the survey are not considered very good due to the large amount of metal around the mine site. The extension of L3 to the northeast along the escape road does show the normal type of response expected from this geological environment. The average background values are approximately 58,500 gammas and shows very little variation. Anomalous values are very evident and three areas show values considerably above background as marked (A, B, J). The higher response could be due to either a change in rock type or a local introduction of magnetite which could be associated with ore formation.

(B) Self Potential Survey

The results show strong response along Line 3 and two major sources have been identified, A and B, with minor sources at C and J.

There is no apparent influence of surface mining equipment on the results and it is surprising that the response over

VII 1982 PROGRAM (CONT'D)

(B) Self Potential Survey (Cont'd)

the location of the ore body, presumably west of station 0+00, was not much stronger. The initial conclusion is that the sources identified as A and B must be much better than the ore body at present being mined. A strike of 110 degrees has been assumed on Figure 1A as this appears to be close to the regional strike. The source A would strike onto the COG 2 claim with B, C, D and J located on the same claim. It is apparent that additional anomalies occur to the north along the road but these were not followed at this time.

Results over Lines 0 and 1 are not conclusive as the lines were restricted due to topography and did not permit a proper background level to be established. The results do however show some negative peaks but a source location would be difficult to interpret.

(C) VLF Survey

The VLF results show a strong variation which is characteristic of this type of geology. Variation in the inphase level is probably due to local changes in the intensity and direction of fracturing. Weak anomalies occur in the area of the Self Potential sources A and B but does not show any major response over the ore body. A weak crossover is located at station 1+10S and may be the only indication of the Ruth Vermont ore body.

(D) CEM Survey

The only major anomaly is located on Line 0 and a conductor axis with a low dip to the south has been interpreted as indicated (D) on the profile. If a strike of 110 degrees is

VII - 1982 PROGRAM (CONT'D)

(D) CEM Survey (Cont'd)

assumed then this conductor would cross Line 3 near the south end. There are indications of some variation in response in that area of Line 3 which could not be fully defined due to topographic limitations.

(E) Max-Min Survey

The Max-Min results show very weak variation over the location of the adits and are considered to be within background.

(F) Induced Polarization

A short test was conducted but the amount of pyrite and graphite, which is obvious throughout the area and would produce much greater variation than a base metal body, made it difficult to justify any amount of work with this method in preference to the others.

TEST CONCLUSIONS

The general conclusions resulting from the test work were as follows:

(1) Magnetic data was not valid near the mine but showed significant anomalies above a flat background where Self Potential sources have been interpreted. Should be used as a general mapping tool as it may also show differences in rock types.

(2) VLF results are normally highly variable in this type of geology. The results do show weak crossovers which are close to anomalies produced by other methods so should be used in conjunction with other methods.

VII - 1982 PROGRAM (CONT'D)

TEST CONCLUSIONS (CONT'D)

(3) Self Potential results showed the best variation of all the methods tested. At least two major sources have been identified, both are much stronger than the response over the Ruth Vermont ore body. These results may indicate that the two sources A and B have greater economic potential than the ore body presently being worked. Due to mutual interference between the anomalies it is not possible to interpret a depth to each of the sources. The fact that no major response was obtained with the CEM suggests that a minimum depth of 30 meters, possibly as great as 153 meters to the centre could be valid. The fact that the response obtained by the other geophysical methods was not very good suggests that the volume of ore at the mine is not very large or it occurs at greater depth than the penetration capabilities of the methods used.

The additional sources marked, C - J, are all considered relatively weak and should probably be visible at the subcrop as graphitic or ore rich zones.

(4) CEM results showed no response near the adits but did indicate a low dipping, shallow body (D) on Line 0. The depth to the top is probably less than 10 meters and this could easily be confirmed by trenching on the steep hillside.

(5) Max-Min results were not significant and this method was dropped in preference to CEM. Operationally the CEM is much easier to run in rough terrain and correct automatically for change in elevation between the coils.

VII 1982 PROGRAM (CONT'D)

TEST CONCLUSIONS (CONT'D)

(6) Induced Polarization was eliminated as a potential exploration method due to the highly variable amounts of pyrite and graphite throughout the country rock.

(7) Exploration methods for all other survey grids was established as magnetic and VLF for general mapping, Self Potential as the primary survey method combined with CEM as the ancillary method.

RECOMMENDATIONS

The following program is recommended to evaluate and define the key anomalies described above as well as to obtain more exploration information on COG I and COG II which are generally on strike with mineral showings on the DEB claims to the northwest.

(1) Continuation of Line 3 as well as additional detailed follow-up to anomalies on Line 3.

(2) Computer modelling and further interpretation may be desireable prior to drilling. Modelling and detailed work may slightly modify drill locations.

(3) On Line 3 drill 300m holes at a 45° angle and a bearing of 25° from 825N and 885N.

(4) On Line 3 drill a 200m minimum depth hole at a 45° angle and a bearing of 200° from 700N.

(5) Drill extension of anomaly A on COG II

VII - 1982 PROGRAM (CONT'D)

II - TECT GRID (Figure 2A, 2B, 2C, 2D, 2E, 2F, 2G)

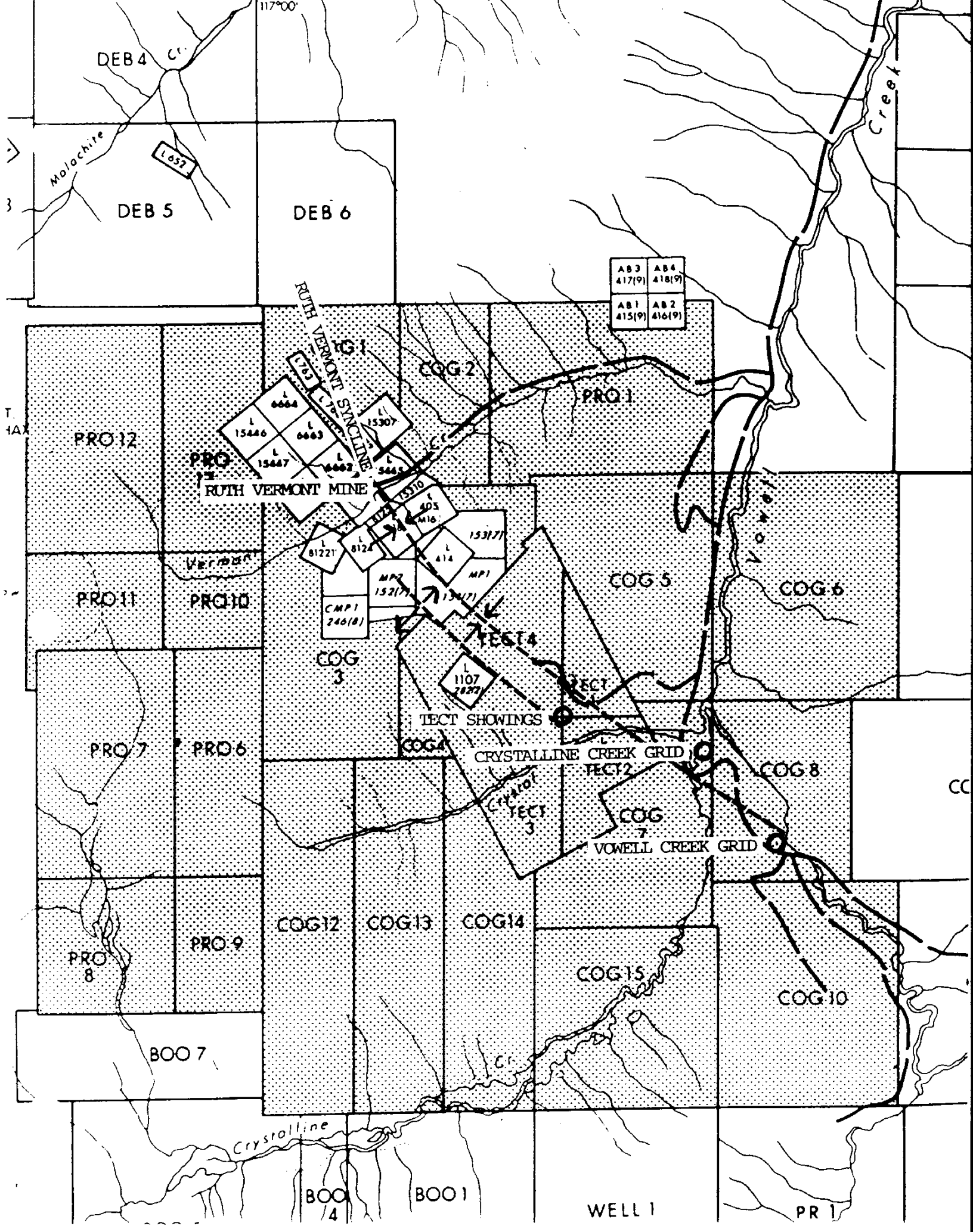
Geology

The geology on the Tect claims is essentially the same as on the Ruth Vermont. However the exposure of bedrock is much poorer and good structural measurements are possible only on the roadcuts.

The most important structural element at the Ruth Vermont mine is the Ruth syncline which occurs within the hinge zone of a major anticline. The Ruth syncline has mineralization associated with quartz veins obliquely intruding limestone on the lower (southwest) limb. The B.C. government mining report on the Ruth Vermont Mine (1966) give the Ruth syncline as striking 135°, plunging shallow to the southeast and having an axial plane dipping 75° north. The Ruth syncline has been plotted on an enclosed figure and it is projected through the Tect mineralization.

Previous mapping has indicated a series of low amplitude synclines and anticlines passing southeast through the Tect claims. It would appear that these local folds are minor flexures and part of a larger structure, probably the Ruth syncline.

Rocks on the Tect claims are part of the Proterozoic Horsethief Creek Group. They include phyllites, arkose, grit and minor conglomerate and limestone. The phyllites are grey and generally well foliated. The arkoses and grits vary in quartz content, contain angular to subrounded fragments and generally exhibit poor sorting. The limestone is grey and impure. At trench 77-3, besides galena and silver mineralization, travertine was observed suggesting a hot spring environment at some point in the rock's history.


117°00'
DEB 4
Cr.
Malachite
L 657
DEB 5
DEB 6
Creek
AB 3 417(9)
AB 4 418(9)
AB 1 415(9)
AB 2 416(9)
RUTH VERMONT SYNCLINE
L 763
COG 1
COG 2
PRO 1
PRO 12
PRO
RUTH VERMONT MINE
L 6664
L 15446
L 6663
L 15447
L 6662
L 15307
L 5445
L 15310
L 405 M16
L 81221
L 8124
L 414
153(7)
MP1
MP2 152(7)
CMP1 246(8)
Vermont
PRO 11
PRO 10
COG 5
COG 6
TECT 4
COG 3
L 1107 7827
TECT 1
TECT SHOWINGS
COG 4
CRYSTALLINE CREEK GRID
TECT 2
COG 8
PRO 7
PRO 6
Crystal
TECT 3
COG 7
VOWELL CREEK GRID
COG12
COG13
COG14
PRO 8
PRO 9
COG15
COG 10
BOO 7
Cr.
Crystalline
BOO 4
BOO 1
WELL 1
PR 1

VII 1982 PROGRAM (CONT'D)

Geology (Cont'd)

Norcen mapped a flexure or bend to the southwest in a major anticline on the southwest portion of the Tect claims, this could be caused by secondary folding or faulting, (Crystal Creek is interpreted as being a local fault), or a combination of both.

Geology and Geophysics to date seem to indicate a secondary fold with the axis striking 220^{O} in this area.

To summarize, the Tect mineralization appears to be on the same general structures, as the Ruth syncline and the Ruth Vermont mine. The mineralization at Tect is associated with quartz veins and carbonate in the form of limestone, dolomite or coarse recrystallized carbonates and appears to be localized by folds and shears.

Geophysics

Magnetic, VLF and CEM results all show weak variations over the grid but no definitive anomalies or trends can be established on the basis of these results. The Self Potential survey shows the greatest variation and indicates anomalies which correspond closely to the mapped geology as well as the geochemical results. The interpreted fault, (Figure 2G), is based on a very strong change in the background level between the north and south parts of the area. The direction is parallel to an assumed fault along Crystal Creek as marked. A comparison with the zinc geochemical results (Norcen 1980) shows that several anomalies are located between these two indicated faults. This correlation would suggest that continued exploration should be concentrated between the faults, the area to the north should not be ruled out on this basis alone as there may be a simple downthrow to the

VII 1982 PROGRAM (CONT'D)

Geophysics (Cont'd)

north producing this effect. A number of sources have been indicated on the map, the majority of which are shallow and located close to the peak of maximum negative value. A number are very close to lithological boundaries shown on the geology map (Figure 2A) which may be sufficient in itself to cause the anomalies, A and B, are the strongest and are worthy of further investigation. Anomaly A represents a north dipping body with a depth to the centre of 58 meters. The strike of this body appears to be 220^{O} and it appears to be controlled by a similar striking folded structure. The mineralization encountered in DDH, 29-11 may be localized in cross fractures with a geochemical expression perpendicular to the axis of this structure with the main body located in the nose. This anomaly would have been more apparent had north south lines been run.

Anomaly B has not been tested by previous drilling as there is no associated geochemical anomaly. A depth to the centre of 19 meters is indicated although the source probably extends to the subcrop. The direction is about 110 degrees but due to local interference from other anomalies this may be questionable. There are several other small shallow anomalies in the vicinity but not under old drill holes.

To the east of 50W on 3S there is a huge change in background possibly related to structure or the beginning of a large anomaly on the west limb of a fairly major syncline. There is also a large uninvestigated geochem anomaly in this area.

RECOMMENDATIONS

(1) Further work should be concentrated to the southeast of 250 on Line 3.5S and lines further south. SP and Geochem anomalies should be extended further south and followed up by trenching and possible drilling.

VII 1982 PROGRAM (CONT'D)

RECOMMENDATIONS (CONT'D)

(2) Anomaly A should be drilled with a hole at 2+25 south and 3+10 west at a bearing of 350° a dip of 45° and a depth of 100m.

(3) Anomalies B, A west and A east should be trenched traverse to strike with a cat using local drill roads and along strike with blast hole trenches.

(4) Other mineralized shows and anomalies should be reconsidered for trenching.

VII - 1982 PROGRAM

III WARREN CREEK (Figures 3A, 3B, 3C, 3D, 4E)

Access and Physiography

The Warren Creeks claim cover a steep valley within the Purcell Mountains. Access to Warren Creek claims was by helicopter in 1982. Previous access had been by a 4-Wheel Drive trail which starts at the Bobbie Burns Creek bridge, 10 kilometers to the northeast. This trail has recently fallen into disrepair, particularily along the steep sections along the Bobbie Burns Valley.

Elevation within the 1982 study area are between 6200 feet (1890) meters) and 7000 feet (2133 meters).

Previous Work

In 1920, a 35 and 20 foot tunnel and several hand trenches were completed on the property.

In 1956, a geological investigation by H. Cohen for R. Le Beuf was undertaken. Cohen regarded the copper showing as having limited value but recommended further prospecting and x-ray drilling.

In 1960 and 1961, St. Andrew's Mining conducted airborne and ground EM surveys and 3450 feet of diamond drilling. This work proved the presence of three copper bearing quartz veins. Pyrite and chalcopyrite were concentrated along the vein walls. A.C.A. Howe reported average assays of 0.5% Cu and 0.05% oz/ton silver over 20 to 50 foot widths of vein material. The best hole intersected 1.73% copper, 0.005 oz/ton gold and 1.17 oz/ton silver across 13 feet.

In 1968, Carolin Mines carried out an Em survey, 2600 feet of bulldozer trenching and 2180 feet of diamond drilling.

VII 1982 PROGRAM (CONT'D)

Previous Work Cont'd

In 1971, a report by E.O. Chisolm recommended further work on the basis of the EM survey. In 1972 Juniper Mines contracted Cochrane Consultants to conduct detailed geochemical and geophysical studies. In 1973 Juniper Mines contracted Aglis Engineering to extend geophysical and geochemical surveys conducted in 1972. A report by Holcapek in 1973 concluded that the copper mineralization was spotty and recommended dropping the claims.

In 1981 Bluesky Oil and Gas acquired the claims through an option agreement with Cochrane Oil and Gas. Work conducted in 1981 included a brief visit by Bill Day and a detailed geochemical survey.

Geology - Regional

The regional geology was mapped by J. Ressor of G.S.C. in the 1950's and described in the G.S.C. Memoir 369 "Geology of the Landeau Map - Area, East Half, British Columbia" (1973).

The property lies along the eastern flank of the Purcell Mountains, 20 kilometers west of the Rocky Mountain trench. The claims group is underlain by sediments of the Proterozoic Horsethief Creek Group. These sediments comprise slates, argillites, quartz pebble conglomerates, quartzites, grit and minor limestone. These rocks are weakly metamorphased.

Structurally, the area is folded into northwesterly trending, in places closely spaced folds. Faulting is local. The nearest major intrusive is the Bugaboo quartz monzanite-granodiorite Batholith, 10 kilometers to the southwest.

VII 1982 PROGRAM (CONT'D)

Local Geology

Rocks on the property consists of phyllites, quartz pebble conglomerate, argillites, limey talc schist and quartzites or arenites. Contacts are commonly gradational phyllites appear to be predominate.

The main showing on the property is within a shear system trending 132°. The copper mineralization is the form of choliopyrite and bronite occurs within a few feet adjacent to the footwall of the quartz vein. The quartz vein is generally about 20 feet wide. Four small adits or pits were mapped by Day in 1981. Grab dump samples assayed over 4% Cu.

The copper mineralization occurs in pods and along the foliation. Day considered the mineralization to be quite spotty. The author briefly visited the showings to confirm previous descriptions. The tunnel at the upper showing and the road leading to it are now covered by talus.

No outcrop was seen west of Warren Creek during the 1982 survey. The overburden comprises talus in the higher areas and reworked boulder till along the valley floor.

Geophysics

Geophysical work was done as follow-up to geochemical anomalies found in 1981. Work was done predominately west of Warren Creek in contrast to a previous concentration of work east of the creek.

The Magnetic and VLF surveys showed very little variation over the grids which were located on geochemical anomalies. A CEM Line (4E), was surveyed along the road in order to try and locate any major structures through the area in an east-west direction parallel to

VII 1982 PROGRAM (CONT'D)

Geophysics (Cont'd)

faulting on which adits and drilling are located. No conductivity variation was observed along the line. Self Potential results show weaker response than the previous areas but have numerous negative peaks indicating a large number of narrow, near surface sources but no specific trend can be identified.

Recommendations

The 1982 survey seems to confirm older studies indicating narrow veins and spotty mineralization. Several of the shallow Self Potential anomalies and geochem anomalies on the south grid warrant trenching and more prospecting.

VII 1982 PROGRAM (CONT'D)

IV NORTH PRO GRID

Access and Physiography

Access to the North Pro Grid is by walking from the Ruth Vermont mine for 1 kilometer up the Vermont Creek Valley. The vertical gradient between the mine and the east line of the North Pro Grid is 330 meters (1000 feet).

Within the 1982 surveys the elevation is between 1966 meters (6450 feet) and 2300 meters (7540 feet). The vegetative cover varies from thick shrubs to trees and alpine meadow.

Geology

The claims are underlain by weakly metamorphosed sediments of the Proterozoic Horsethief Creek Group. The rocks seen were phyllite, arkosic arenite, quartz pebble conglomerate and very minor limestone. The phyllite exhibits good cleavage. It is much greener in color than seen elsewhere, suggesting a strong chlorite component.

The arenite commonly has a high feldspar content with angular, poorly-sorted fragments. Hence it is referred to here as an arkosic arenite. In places where the quartz content is high and grains are coarse, it appears to grade into the quartz-pebble conglomerate. The limestone is dark grey and inpure.

The character of the sediments suggests an environment of rapid deposition. The strongest structural component is a foliation along a steeply dipping to vertical plane trending 140^{o}. The area covered by the geophysical grids appears to be within the nose of a major southeast trending syncline.

VII 1982 PROGRAM (CONT'D)

Geophysics

The geophysical program was designed to further define and evaluate geochemical anomalies found in the 1981 study.

The magnetic results show general changes in background level, probably due to changes in rock type, and in the southern part of the area a narrow banding which is different in character. This banding could be caused by local introduction of magnetic material.

The VLF and CEM results showed very little variation throughout the whole area.

The most significant response was obtained using the Self Potential method with major anomalies on Lines 600E and 750E. Interpretation of these results indicate a major source as shown, striking at about 110 degrees and a depth to the centre of the source at 150 meters. This location corresponds with narrow magnetic bodies as well as major geochemical anomalies which continue to the west.

Recommendations

Considering the favorable geology, geochemical anomalies and the major, classic Self Potential anomaly, drilling is recommended at location 600E Station 290S at a bearing of 180^{O}, a dip of 45^{O} and a depth of 200 meters.

VII 1982 PROGRAM (CONT'D)

V CRYSTALLINE CREEK (Figures 5A and 5B)

Geology

The Crystalline Creek Grid is located 340 meters southeast of the new bridge crossing Crystalline Creek. The grid was established in 1982 to find a possible extension of the Tect mineralization which lies 1.5 kilometers to the northwest. Over 1 kilometer of Self Potential, Magnetometer, VLF (two stations) and Topography were completed.

No bedrock was seen on the lines. The grid is covered by glacial outwash. The overburden is thought to be fairly shallow as nearby bedrock is exposed on Vowel Creek. Sediments of the Horsethief Creek Group underlie the claims.

A malachite-azurite showing is reported to occur east of Vowell Creek, about 900 meters south of the Vowell-Crystalline Creek junction. The showing is on a geological map surveyed for Kamloops Copper Consolidated in 1966. No assays are reported.

Geophysics

The survey lines at Crystalline Creek were located in order to check the continuation of the Ruth syncline from the Ruth Vermont mine through this part of the property.

The magnetic results show high values at the south part of the lines in excess of 59,000 gammas. These values suggest a major change in rock type with a contact close to the indicated 1000 gamma contour i.e. in an east-west direction. Local introduction of magnetite could also produce the same effect. The VLF data shows a distinct difference between the results obtained from

VII 1982 PROGRAM (CONT'D)

Geophysics (Cont'd)

the Seattle and Cutler stations. Maximum response was obtained using the Seattle sttion indicating that conductivity trends are closer to a north-south direction rather than east-west, contrary to an east-west direction contact suggested by the magnetic data. The Self Potential results show a number of strong negative peaks indicating sources which cannot be traced between the two lines. This may be caused by a strike closer to the line direction and this can only be confirmed by more work with a different line orientation.

Recommendations

Additional north-south lines are required as well as enlarging and extending the grid area and combining geophysics as well as geochemistry.

VII 1982 PROGRAM (CONT'D)

VI VOWELL CREEK GRID (Figures 6A and 6B)

Geology

The Vowell Creek Grid starts on the main road 1.7 kilometers southeast of the new bridge crossing Crystalline Creek. The grid was established in 1982 to find a possible extension and widening of the Tect mineralization 2.5 kilometers to the northwest. Two lines totalling over 1 kilometer of Self Potential, VLF, Magnetometer studies were done at 25 meter spacing. The grid is essentially flat at 1425 meters altitude.

The grid is thought to be near the FE, HIL Gold-Silver-Lead-Line showing (G.S.C. Map B26A, Geology Landeau East Half). The grid was established after the discovery of several large rusty-white quartz boulders nearby. The boulders are similar in appearance to quartz associated with mineralization at Tect. The boulders are thought to be close to a source possibly in the grid area. Also found in 1982 was rust-stained gravel probably discoloured because of iron in spring water.

No bedrock was seen on the grid but it is probably shallow. The overburden is reworked till or outwash material. The underlying sediments are mapped as being from the Proterozoic Horsethief Creek Group.

Geophysics

The Vowell Creek grid was surveyed, like the Crystalline Creek grid, in order to check the continuity of the Ruth syncline. The magnetic results show the flat response expected from unaltered sedimentary rocks encountered on the other survey grids. The VLF results show unusually small variation, possibly due to the masking effect of the river gravels. Some weak crossovers do occur and both lines look very similar suggesting structures

VII 1982 PROGRAM (CONT'D)

Geophysics (Cont'd)

normal to the survey lines. The Self Potential results show a number of negative peaks, each of which could be interpreted as individual sources near surface. The most important feature is the difference in base levels at the western limits of each of the lines. This indicates a Self Potential source locally but at an angle close to that of the survey line direction. This was unexpected as the survey lines were set out to intersect targets at approximately 110 - 135 degrees and the results may show a new strike direction for potential ore zones.

Recommendations

The location and direction of the indicated source should be established with additional lines at right angles to the present lines.

The detailed work done on the Tect grid as well as the reconnaissance grid on Vowell and Crystalline Creek indicate that the southern as well as the northern half of COG 7 and all of COG 8 warrant detailed ground geophysics and geochemistry.

VII 1982 PROGRAM (CONT'D)

VII ADIT GRID - TECT (Figures 7A, 7B, 7C, 7D)

Geology

An old adit was located near the northwest border of Tect 4. According to the claim map its location plots at least 100 meters northeast of Crown Grant 1107. However the present owner (Mel Pordek) states that it is on his Crown Grant 1107.

The adit entrance was once 6 feet by 4 feet but talus has since fallen leaving an opening of 3 feet by 1 foot high. The timbers have rotted and some have fallen down.

An alteration zone, phyllitic to argillitic occurs over the adit entrance. This zone is 1.5 meters wide and strongly weathered. East of this zone is a prophlitic zone with pyrite, quartz, marcasite, possibly arsenopyrite and epidote. East of this zone is vuggy quartz veining with calcite. Above the adit quartz was seen in composite fractures trending 005 and 120^{O}.

Elsewhere on the grid, the bedrock is poorly exposed in the immediate vicinity of the geophysical surveys. The rocks seen were phyllites and arkose, with foliation striking southeast. Quartz veining is oblique to the foliation.

Geophysics

A small Self Potential anomaly on Line LAD 1 may be the continuation of the mineralized vein system along a generally parallel trend.

The Adit grid is located on a mineralized structure north of the Tect claims. Both the magnetic and VLF results show no

VII 1982 PROGRAM (CONT'D)

Geophysics (Cont'd)

variation in response that could be attributed to the structure visible at the adit. Negative peaks are obvious on the Self Potential results but no correlation is possible between lines.

Recommendations

Several samples were taken in the vicinity of the adit. These should be assayed. The adit should also be opened and thoroughly examined and sampled.

The surrounding area and ridge top to the northwest warrant detailed geology and prospecting. Due to the rough topography, a proper program will require carefully planned safe traverses with helicopter pickup and drop points.

VIII CONCLUSIONS

The mineralization at Tect, COG and North Pro have the following common features with the Ruth Vermont Property:

(1) Abundant quartz veining, both barren and sulphide bearing.
(2) Limestone of coarse carbonate.
(3) Near by phyllite with coarse pyrite and associate schists.
(4) Favorable structure, southern limb and below limestone within Ruth or adjacent syncline.
(5) Argentiferous galena and sphalerite in clean white quartz and fine grained replacement sulphides in carbonate rocks.

The geophysical work has located a number of very strong anomalies on the various survey grids and when compared to the test results over the ore body at the Ruth Vermont mine, suggests a much greater economic potential than the ore body that was recently being mined.

The prime geophysical method is that of Self Potential and although slow to operate has been the most definitive in locating the possible source of the geochemical anomalies. The CEM only produced one anomaly, located near the Ruth Vermont mine. Magnetic and VLF surveys did not produce major anomalies but did provide supporting data for the other methods.

Major anomalies are located on the following grids, Ruth Vermont, North Pro and Tect with strong indications of similar response in the Crystalline Creek and Vowell Creek areas.

No major anomaly was found on the Warren Creek grid and this may be due to the mineralization being of a more disseminated type.

Specific evaluation programs have been recommended to evaluate all major anomalies for each described area. A more regional program of geology, geochemistry and geophysics has been recommended to continue

the Tect, Vowell and Crystalline grid anomalies as well as to explore and develop what appears to be the continuation of the Ruth syncline and mineralization.

IX CRYSTAL CREEK PROGRAM - 1982 EXPENDITURES

Field work for this program was conducted between June 4, 1982 and June 9, 1982 for COG II, a report for this work was submitted in June of 1982. Field work on the other seven grids described in this report was conducted between July 4 and July 28, 1982. Planning and interpretation took place before, during, between and after these field programs. Considering each survey separately over 121,150 meters of line were run. The following personnel and equipment were used on the program.

Personnel:

1 Geophysicist - 25 days
3 Geologists - 68 days Total
7 Technicians - 101 days Total

Equipment:

1 VLF-EM Unit	- 9 days
1 Magnetometer	- 9 days
2 VLF-EM Units	- 24 days
2 Magnetometers	- 24 days
1 Crone CEM System	- 33 days
1 Max Min EM System	- 24 days
2 SP Units	- 24 days
1 IP System	- 7 days
2 4x4 Jeeps	- 24 days
1 2x4 Truck	- 3 days
1 1½ Ton Trailer	- 2 days
1 Jet Ranger Helicopter	- 2 hours
General geology field camp and ..office equipment including generator and fridge	- 33 days - 24 days
Drafting Equipment & Supplies	- 15 days
1 ATC Vehicle	- 24 days

The turn key price for this entire program was $40,000.00.

+ overhead 2000.00

42000.00.

T.K

EQUIPMENT SPECIFICATIONS

The specification for the equipment used was as follows:

(1) Magnetic survey

Instrument	- Geometrics G-816 Proton Magnetometer S/N
Reading accuracy	- 1 Gamma
Repeatibility	- 1 Gamma on pole
	- 5 Gammas with backpack
Range	- 20,000 - 90,000 Gammas
Gradient tolerence	- 150 Gammas/ft.

(2) Self Potential survey

Instrument	- Fluke Digital Volt Meter
Reading accuracy	- 0.1 millivolts
Input inpedence	- 50 M OHM +
Ground contact	- Copper Sulphate - Porous Pots

(3) Electromagnetic surveys

(a) V.L.F. survey

Instrument	- Geonics EM 16 S/N 114
Frequency	- 15-25 KH2
Parameters	- inphase- out of phase
Accuracy	- + or - 1%
Tuning	- Individual plug in units

(b) CEM survey

Instrument	- Crone CEM system S/N
Coil separation	- up to 600 feet

Mode	- Horizontal Shootback, vertical and Horizontal Loops
Frequencies	- 390, 1830, 5010 H2
Accuracy	- + or ½ degree

(c) Max-Min survey

Instrument	- Apex Max-Min II S/N
Coil separation	- 50, 100, 150, 200, 250 meters
Frequency	- 222, 444, 888, 1777, 3555, H_2
Parameters	- inphase and quadrature
Modes	- Max, Min, Vertical Loop
Accuracy	- 0.25 - 0.5%

(4) Induced Polarization

Transmitter	- Huntec MK III Lopo S/N - 250 Watts - Pulse time 2 seconds on/off and reverse cycle
Receiver	- Huntec MK III S/N - Primary Voltage + 4 secondary voltages - Chargeability as % of primary voltage

SURVEY SPECIFICATIONS

(1) Magnetic Survey

Readings were normally taken at 25 meter station intervals in a series of loops closed to established base stations and corrected for draft and base level shift in the normal manner. All survey work was carried out with the sensor in the backpack producing a repeatibility of about 5 gammas.

(2) Self Potential Survey

The two contact electrodes were calibrated at the start of each survey loop by taking a reading at each station. Maximum distance between the two electrodes was 150 meters the base electrode was moved when necessary. Each survey area was covered in a series of closed loops which were tied together and corrected for calibration and drift.

(3) Electromagnetic Survey

(a) VLF Survey

Seattle and Cutler stations were both used during the survey depending on the survey line direction and assumed geologic strike. The differences are indicated on the survey maps.

(b) CEM Survey

A separation of 50 meters and frequency of 5010 Hz was normally used except where otherwise indicated. This system effectively eliminates elevation corrections when used in the horizontal shootback mode and is ideal for the rough terrain over most of the survey grids. The plotting point is at the midpoint between the two coils.

(c) Max-Min Survey

A coil separation of 50 meters and station interval of 25 meters was used for the limited amount of work that was carried. A

SURVEY SPECIFICATIONS (CONT'D)

(c) Max-Min Survey (Cont'd)

frequency of 1777 Hz was used throughout, and the readings corrected for differences in elevation in the normal manner by using the tilt meter.