RESEARCH PROPOSAL

SULLIVAN CAMP - EAST KOOTENAY DISTRICT,

BRITISH COLUMBIA

822609

Prepared For

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1.00 SUMMARY

This proposal will facilitate the identification of top priority Sullivan type Pb-Zn-Ag targets in the Aldridge Formation of southeast British Columbia. The Sullivan Mine at Kimberly, B.C. is a world class deposit of the stratiform sediment hosted Pb-Zn-Ag type. The mine produced 144 million tons of ore averaging 6.5% Pb, 5.6% Zn and 2.3 opt Ag to 1988, and is expected to remain in production for an additional 10 - 15 years. Sullivan is hosted by the pre-Cambrian Purcell Supergroup which comprises a thick sequence of sandstones and siltstones.

The Sullivan camp is a priority target area for this type of deposit in Canada. Attractive exploration parameters include ease of access, good infrastructure and labour force, moderate climate, an abundance of showings and a low density of advanced exploration coverage. There have also been recent improvements in the understanding of the Sullivan Deposit Model which may highlight new and previously underexplored exploration targets.

The area has a long history of grassroots exploration and many targets have been identified. All showings and other mineral indicators are covered by claims, and establishing a new property position with a defined target is likely to involve negotiating deals with existing property owners. Property acquisition opportunities will be developed for the client company over the entire Canadian exposure of the Aldridge Formation. A compilation of geology, mineralization and other mineral indicators will be constructed and the tenure status defined over areas of interest. The most attractive opportunities will be determined by favourable geology and mineralization as well as the ease and cost of assembling a land position.

Qualified Cominco-trained staff with extensive Aldridge Formation experience will conduct the research and property examinations, and be available to assist in initiating negotiations and conducting field programs.

2.00 DESCRIPTION OF THE EXPLORATION TARGET

The primary target of exploration in the Purcell Supergroup is a Sullivan-type stratiform sediment hosted Pb-Zn-Ag sulfide deposit. Other examples of large deposits in this class include the Mt. Isa Deposit in Australia, the Red Dog Deposit in Alaska, the Howards Pass Deposits in the Yukon, Silvermines in Ireland and Meggen in Germany. In southeast British Columbia, the most favourable setting for this type of deposit is in the Aldridge Formation, although there is also evidence of this type of mineralization in the upper parts of the Purcell Supergroup.

The Sullivan Camp has been selected as a priority target area for this deposit type based on:

- ease of exploration access
- established power, transport and service infrastructure
- moderate climate
- proximity of a smelter and an established and settled workforce
- the presence of a proven viable deposit of world class (i.e. Sullivan Mine), with a remaining mine life of <15 years (est).
- a regional abundance of showings and other mineral indicators
- a low density of regional diamond drill and surface geophysical exploration
- recent improvements in the understanding of the Sullivan Deposit Model which may highlight new and previously under-explored exploration targets.

The Sullivan Mine has produced 144 million tons of ore averaging 6.5% Pb, 5.6% Zn and 2.3 opt Ag to 1988. Minor amounts of tin, gold and bismuth have also been recovered. The Sullivan is one of the largest deposits of this type in the world, and has had a major impact on the economy of British Columbia for a period exceeding 75 years. The mine is expected to remain in production for up to 15 years.

The following description of the Sullivan orebody is partly taken from Cominco's work (Hamilton et al., 1983). The reader is referred to this volume for a complete description of the mine. A simplified east-west geological section through the Mine is shown on Figure 1.

West

East

LEGEND

7 "Granophyre."	3 Massive Sulfide.
6 Gabbro – Moyie sills.	2 Footwall Conglomerate.
5 Limit of Tourmalinization.	1 Footwall Breccia.
4 Albitization.	Fault.
	Geologic contact.

0 50 150 metres

SULLIVAN MINE
GEOLOGICAL SECTION

Keewatin Engineering, Inc.

Figure 1

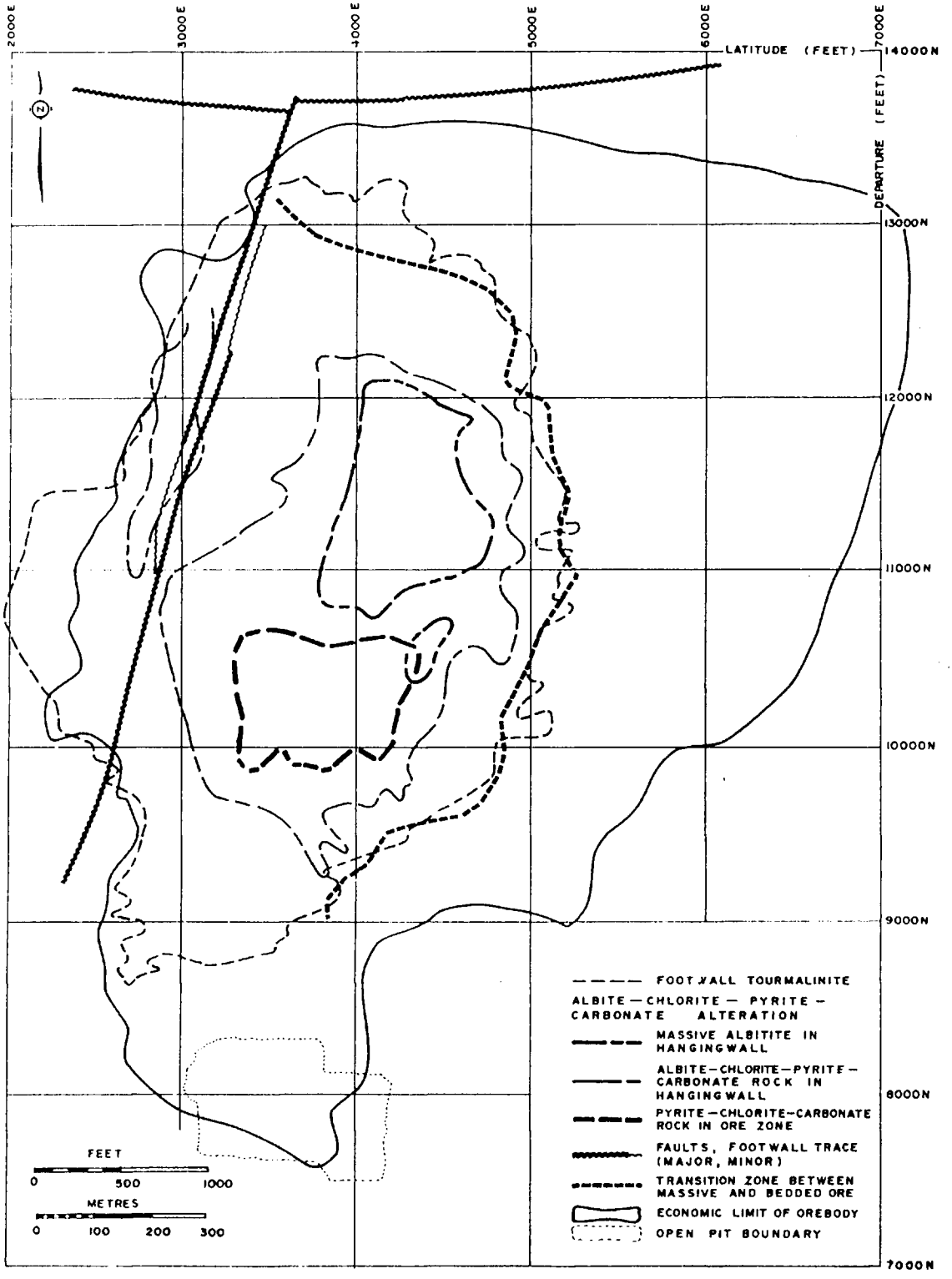
The Sullivan orebody occurs near the top of the Lower Aldridge Formation. It has the shape of an inverted and tilted saucer approximately 2,000 m along its north-south axis and 1,600 m along its east-west axis. It has flat to gentle easterly dips in the west, moderate easterly to northeasterly dips in the centre, and gentle easterly to northeasterly dips in the east. Footwall rocks are intraformational conglomerate and massive wacke overlain by wacke and pyrrhotite-laminated subwacke. The upper part of the ore zone stratigraphy is composed of several fining-upward sequences of quartzitic wacke and subwacke.

Beneath the eastern part of the orebody are two gabbro sills separated by about 150 m of quartz-feldspar-biotite rock (locally called granophyre) which in places has the texture of an igneous differentiate and elsewhere has the texture of a highly altered sedimentary rock. The upper sill, 10 to 15 m thick, is located about 500 m below the orebody. The lower sill is 50 m thick. Below the orebody there is an abrupt change in the attitude of the gabbro-granophyre complex and it rises steeply to approach the footwall of the orebody near its western margin. West of here the gabbro-granophyre complex dips downward to again resume a sill-like form at, approximately, its original stratigraphic position. The resultant configuration is a north-northwest trending arch.

The orebody attains a maximum thickness of 100 m approximately 100 m northwest of its geographic centre, and thins outward in all directions. To the east, the orebody thins gradually. Eastward from the economic limit, the ore zone stratigraphy changes gradually to a sequence of pyrrhotite-laminated wacke/subwacke (argillite) three to five metres thick that persists laterally for at least five kilometres. To the north, the orebody thins more rapidly, but the ore zone stratigraphy is truncated by the Kimberly fault before the economic cut-off is reached. To the west the orebody thins abruptly and is cut by dyke-like apophyses of the footwall gabbro. To the south, within the orebody, ore zone thickness changes are generally irregular and abrupt.

Two satellite deposits, the Stemwinder and the North Star, are located 2 km and 3.5 km respectively south of the Sullivan deposit.

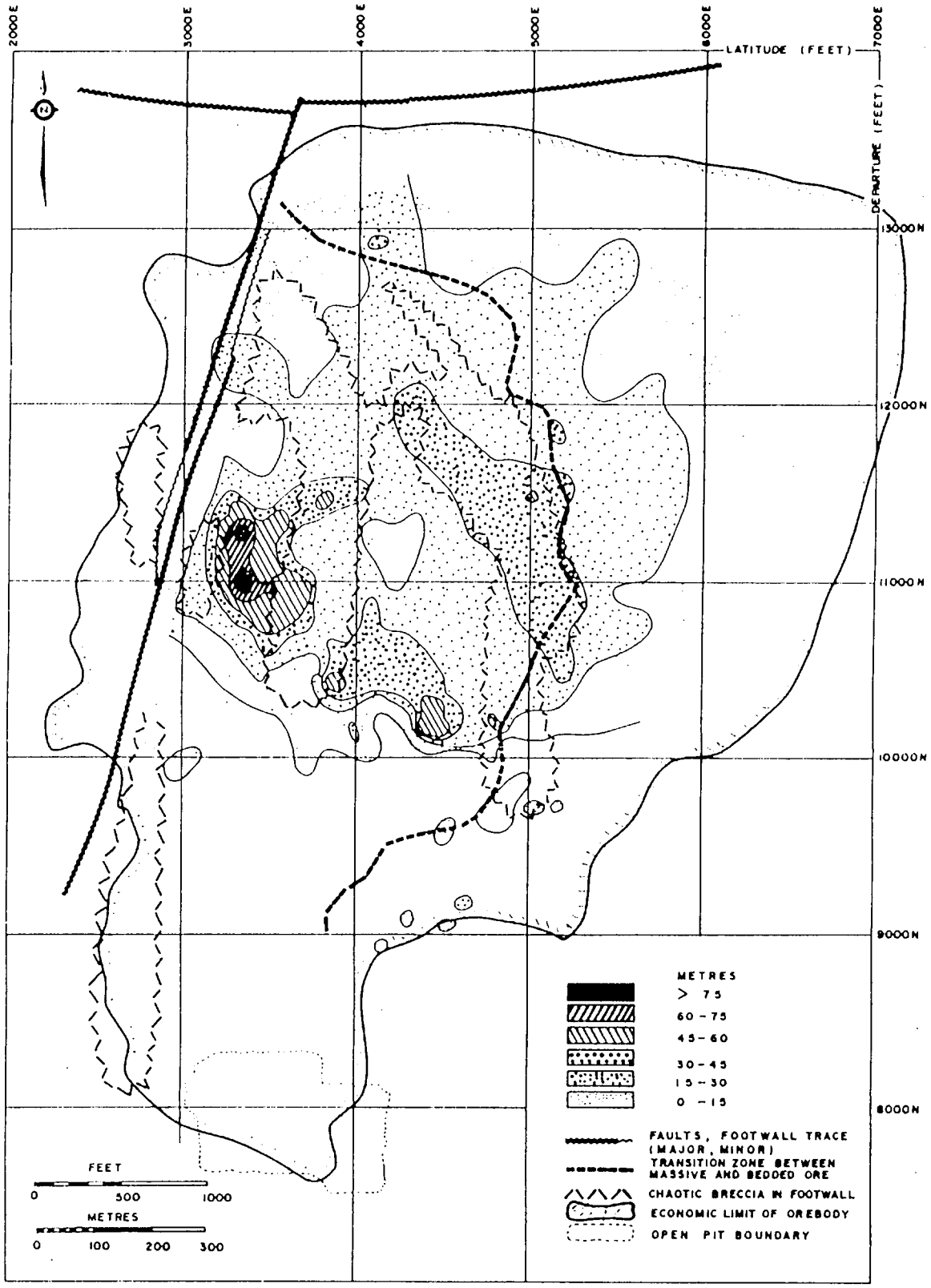
The key features of the stratigraphic setting and mineralization are summarized as follows:



Distribution of altered rocks in and adjacent to the Sullivan orebody
(After Hamilton et al, 1982)

Keewatin Engineering Inc.

Figure 3



ISOPACH MAP OF THE FOOTWALL CONGLOMERATE
(After Hamilton et al, 1982)

Keewatin Engineering Inc.

Figure **2**

Fragmental or Conglomerate: The main sulfide lens at Sullivan is underlain by a large intraformational conglomerate unit. The conglomerate is thickest over the vent area, and thins to the east (see Figures 1 and 2). The conglomerate unconformably overlies the Lower Aldridge Formation. Bedded massive sulfides rest either directly on conglomerate or are separated from it by a few 10's of metres of laminated pyrrhotitic mudstones.

Chaotic Breccia: This zone is developed in the vent area and disrupts both conglomerate and bedded footwall sediments (see Figures 1 and 2). The breccia consists of fragments of Aldridge sediments from sand size to pieces several metres across. Bedded blocks and fragments are often twisted and rotated. Blocks of conglomerate are mixed in with bedded and massive blocks, giving the unit a heterogeneous, chaotic nature. Sulfide minerals form up to 30% of the chaotic breccia unit, commonly forming the breccia matrix. The breccia is interpreted to be the feeder system for the overlying sulfide deposit.

Tourmaline: Tourmaline alteration or tourmalinite forms a broad footwall replacement zone. Massive aphanitic tourmalinite also forms thin stratiform layers in the immediate footwall sediments. Tourmaline alteration overprints much of the chaotic breccia zone (see Figure 3).

Albitic Alteration: Albite (+ chlorite) replacement occurs as a broad alteration halo in the deposit hangingwall. Massive sulfides are altered to pyrite-chlorite-albite rock beneath the albite halo (see Figure 3).

Sulfides: (see Figures 1 and 3). Massive to delicately laminated sulfides form the Main Band and several less important hangingwall ore bands. Massive sulfide zones up to 100 m thick occur in the Main Band. The principle sulfide minerals are pyrrhotite-galena-sphalerite. The sulfides are believed to be hydrothermal exhalative sediments formed above sea floor vents.

Stratigraphic Position: The orebody is located on the Lower Aldridge-Middle Aldridge Formation Contact (LMC).

The G.S.C. and B.C. Geological Survey Branch have recently commenced a major study of the Sullivan Deposit (Leitch, 1991). Some of the early observations of this study appear to highlight previously undocumented aspects of the deposit, and these will be reviewed in some detail, as they appear to define new Aldridge exploration targets which were not prioritized in much of the previous regional exploration work.

The vent zone alteration is described as quartz (silica) rich. Quartz forms rare veins or a breccia matrix cement with calcite-pyrrhotite-chlorite (+ tremolite-tourmaline-biotite-muscovite-sphene-ilmenite). This alteration assemblage contains traces of sphalerite-galena-chalcopyrite-arsenopyrite and is found crosscutting the footwall fragmental rocks.

Sulfide matrix breccias in the vent complex are cemented by pyrrhotite with muscovite-quartz-chlorite-tourmaline-calcite and garnet. Chalcopyrite is common as inclusions in the pyrrhotite along with fine arsenopyrite and traces of sphalerite-galena.

In general, the hydrothermal vent or feeder zone is marked by minor sulfide-quartz veining below the western orebody, and "appears to be manifested upwards by a fragmental with cement or matrix of quartz, calcite, pyrrhotite, tremolite, tourmaline, mica, sphene, garnet and sulfides". The matrix varies from silica rich to sulfide rich.

The mineralogy of the thinly bedded to laminated sulfide zone on the southeast fringe of the Sullivan deposit is also noteworthy. This sequence is called the "Concentrator Hill Horizon". Pyrite and pyrrhotite laminations predominate but thin dark laminations/layers of quartz-carbonate-garnet-hydrobiotite-muscovite and chlorite occur interlayered with the sulfides. Minor tourmaline, sphalerite and galena are associated with these calc-silicate layers. This assemblage represents the apron or fringe of the Sullivan orebody.

This research project also defined a possible sill or tuff horizon immediately below the orebody. Widespread alteration of this horizon by magmatic fluids related to the gabbro intrusions is also inferred by Leitch (1991). The Sullivan study provides strong evidence of a genetic link between gabbro intrusive centres and ore deposition. The alteration assemblages in the footwall vent

system and albite-chlorite alteration similar to that in the hangingwall are all considered to be directly associated with the gabbroic intrusions.

The author has observed evidence of gabbroic intrusion into wet sediments at Sullivan, Kootenay King and Vulcan (the only three verified locations of stratiform Pb-Zn in the Canadian part of the basin). Other locations of early gabbro intrusion have been inferred by other works in the Aldridge, and are also associated with Pb-Zn mineralization.

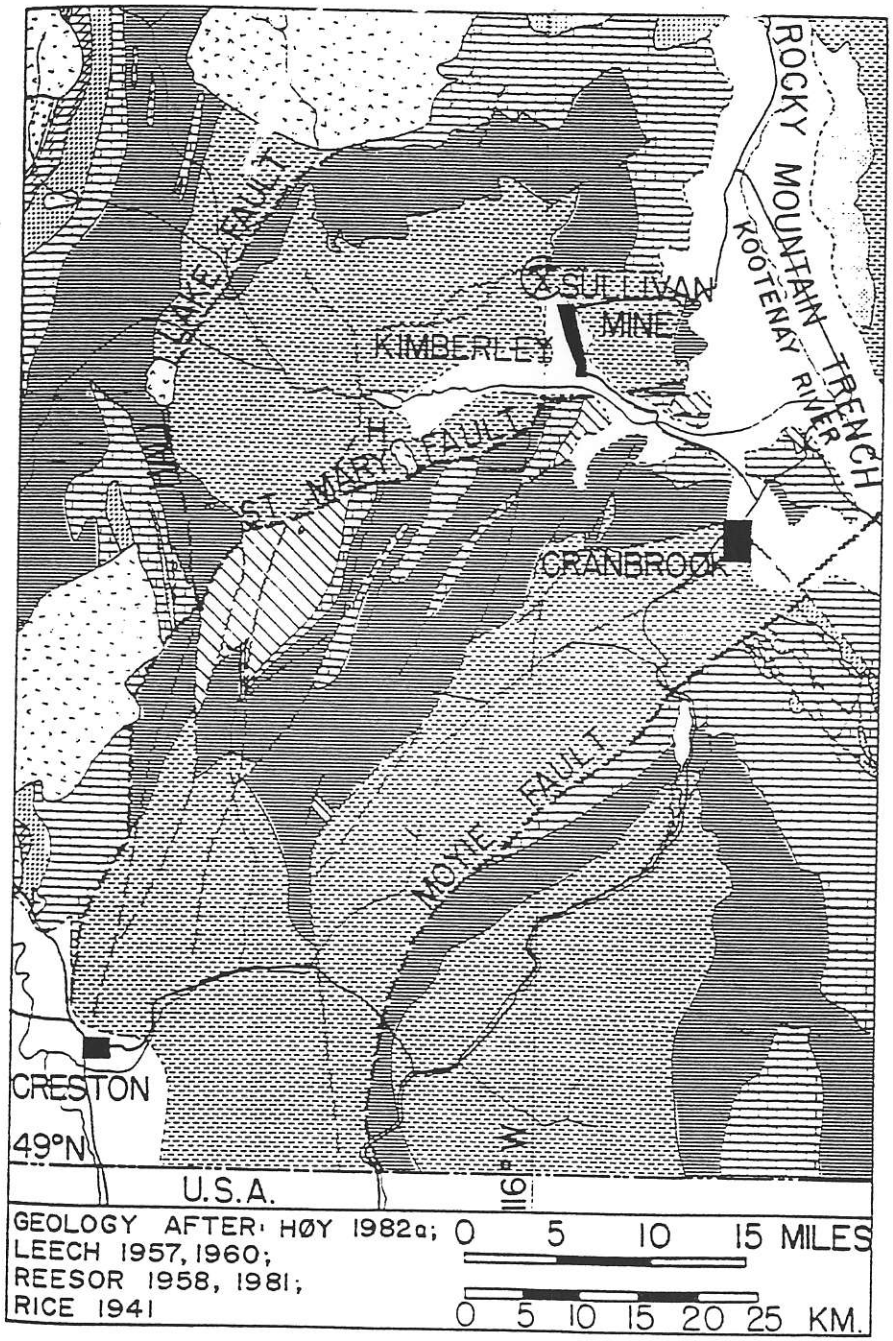
3.00 REGIONAL GEOLOGY AND MINERAL INDICATORS

3.10 Regional Geology

In the Purcell-West Kootenay area, middle Proterozoic stratiform sulfide mineralization is hosted by the Purcell Supergroup, which comprises a large intracontinental flysh basin (see Figure 5). The base of the sequence is not exposed. The lowest exposed unit is the Aldridge Formation, consisting of a +4,000 m thick sequence of siliciclastic sediments. The Aldridge Formation hosts the Sullivan orebody, which occurs on the contact between the Lower and Middle Aldridge Formation (LMC). Proterozoic gabbro sills intrude the Aldridge Formation.

The **Lower Aldridge Formation** regionally consists of a rhythmic succession of laminated to thin bedded fine grained wacke (argillite) and quartzitic wacke (argillaceous quartzite). The sequence is characterized by minor amounts of fine grained disseminated pyrrhotite which imparts a characteristic rusty weathering nature to Lower Aldridge outcrops. Beds are typically graded, and local crossbedding occurs. Intervals of massive to thick bedded quartzitic wacke or quartz arenite also occur (e.g. "footwall quartzite" unit at the Sullivan Mine). Massive to poorly bedded lenses of intraformational conglomerate occur locally near the top of the Lower Aldridge Formation and are composed of Aldridge rock types in a wacke matrix.

The **Middle Aldridge Formation** is predominantly medium to thick bedded light grey weathering quartzitic wacke turbidites consisting of medium grained massive quartz-rich bases overlain by thin wacke-subwacke (argillite) tops. Rip up clasts and flame structures commonly occur in the bases of the quartzite beds and are indicative of high energy, rapid deposition. Subordinate amounts



LEGEND

MESOZOIC — GRANITIC INTRUSIONS

PRECAMBRIAN — H — HELLROARING CREEK STOCK

CAMBRIAN
- EAGER FM.
- CRANBROOK FM.

PROTEROZOIC

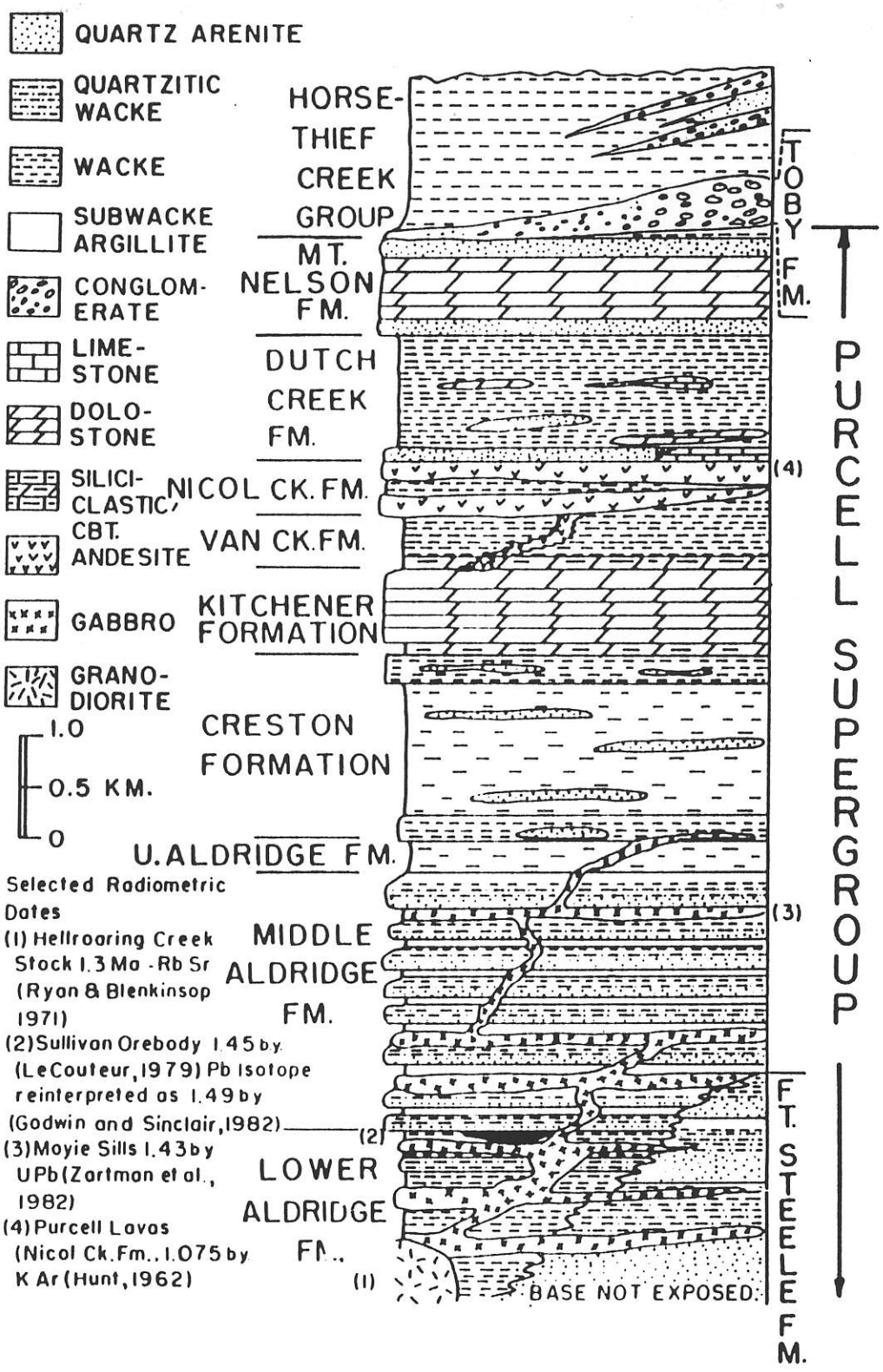
WINDERMERE SUPERGROUP
- HORSETHIEF CREEK GP.
- TOBY FM.

PURCELL SUPERGROUP
- MOUNT NELSON FM.
- DUTCH CREEK FM.
- NICOL CREEK FM.
- VAN CREEK FM.
- KITCHENER FM.
- CRESTON FM.
- ALDRIDGE FM.
- FORT STEELE FM.

REGIONAL GEOLOGICAL MAP

Keewatin Engineering Inc.

Figure **4**



Stratigraphic subdivisions, Purcell Supergroup, Kimberley area, southeastern British Columbia.

(After Hamilton at al, 1983)

of Lower Aldridge type lithologies are interbedded within the Middle Aldridge. Gabbro sills of the Moyie Intrusions intrude both Lower and Middle Aldridge, and are locally observed to crosscut stratigraphy.

The regional geological setting is shown in Figure 4. The Sullivan Deposit occurs on the east side of the Purcell Anticlinorium, a broad zone of dominantly easterly verging thrust and fold structures. The St. Mary Fault and the Hall Lake Fault are large thrust faults.

3.20 Aldridge Mineral Indicators

Specific types of sedimentary units and alteration assemblages are spatially associated with the Sullivan orebody and have historically been used to guide regional exploration for Sullivan type deposits. The well-known indicators are tourmalinites, fragmental sedimentary rocks, albite-chlorite alteration zones and base metal sulfide showings.

Other more subtle mineral indicators are proposed by the author which are currently not widely recognized or applied to exploration. These are based on the hypothesis that penecontemporaneous gabbro sills have an important genetic role in the formation of stratiform mineralized zones and an understanding of the alteration assemblages and field relationships linked to these "early" gabbros. These ideas have been largely supported by preliminary findings of the current G.S.G. - B.C.D.M. Sullivan Project (Leitch, 1991). These are important new concepts which open up new exploration targets in the Sullivan Camp.

3.21 Tourmalinites

Tourmalinites occur as an aphanitic "chert-like" impregnation of tourmaline within Aldridge sediments and results from both replacement of wet sediments by boron-rich hydrothermal fluids and exhalation of boron-rich fluids to form stratiform tourmalinites. There are over 20 tourmalinite localities in the Aldridge Formation, some of the well known ones are:

Sullivan Mine Pb-Zn
Mount Mahon
Goatfell
Estella Mine Pb-Zn
Star Property Pb-Zn
Monument 222
Dodge Creek
Morning Glory (USA)
Upper Moyie River (Lew Property)
Vulcan Property Pb-Zn

Few? of these tourmalinites are associated with Pb-Zn mineralization. However, the footwall vent system of the Sullivan Deposit underwent intensive boron metasomatism which is believed to be penecontemporaneous with deposition of the stratiform sulfides.

3.22 Fragmental Rocks (Conglomerate)

An extensive area of fragmental rock underlies the main sulfide lens at Sullivan and resembles an intraformational conglomerate unit. The fragmental is thickest over the deposit vent area. Two theories for fragmental formation are proposed and there is evidence that both processes are active in the basin. Fragmentals may be shed off penecontemporaneous fault zones, or they may be incorporated into and carried with hydrothermal fluids discharging up fault zones and onto the sediment-water interface. Both models require growth faulting, therefore the fragmental units are spatial indicators of zones of cross-stratal permeability which might channel both boron-rich and metal-rich hydrothermal fluids. There are many fragmental localities in the Aldridge Formation. Some of the best known ones include:

Sullivan Mine
Vulcan Property
Clair Property (Horn Property) Main Fragmental
Clair 6 Fragmental
Lewis Creek

Findlay Creek Area

Doctor Creek

Fors Property

North Kootenay King Property

Only the fragmentals at the Sullivan and Vulcan properties are known to be associated with strata-controlled base metal sulfides.

3.23 Albite-Chlorite Alteration

Albite-chlorite replacement occurs as a broad alteration halo in the Sullivan deposit hangingwall. Massive sulfides are altered to pyrite-chlorite-albite rock beneath the albite halo. The albite zone at Sullivan is clearly post-ore, and is believed to be related to hydrothermal fluids derived from gabbro intrusion. Numerous minor albite zones occur throughout the Aldridge Formation and are usually related to minor gabbro intrusions.

thought gabbro syn sed-metag.

3.24 Fe-Pb-Zn Sulphide Showings

These showings can be divided into two classifications: cross-cutting (vein) and strata-controlled (stratiform).

Significant stratiform sulfides occur in at least four places in the Aldridge Formation; the Sullivan Mine, the Kootenay King Mine, on the flank of the Vine vein and on the Vulcan Property. Massive stratiform pyrrhotite-pyrite zones also occur, occasionally with minor Pb-Zn and the Darling-Horn property is a good example of this type of mineralization. Sullivan and Kootenay King are the only occurrences with massive Pb-Zn sulfide mineralization.

20K tons

No drillholes Cominco grnd.

Significant massive vein type mineralization occurs at the St. Eugene-Aurora Deposit, the Estella Deposit and on the Vine property. The St. Joe Property is a minor vein type occurrence. Several mineralized zones remain unclassified including the Star Property and the Fors Property.

4.00 ADVANCED ALDRIDGE FORMATION PROJECTS

Brief summary descriptions of the main targets of current exploration activity in the Aldridge Formation are given as follows:

4.10 Vulcan Property (Ascot-Cominco)

At the Vulcan property, low grade strata-controlled Pb-Zn-Ag sulfide mineralization is hosted by calcsilicate alteration assemblages and pyrrhotite laminated mudstones on the Sullivan Horizon or Lower-Middle Aldridge Contact (LMC). The host sediments are underlain by a large fragmental unit approximately 3 km in strike length and up to 250 m thick, which also hosts minor pyrrhotite-galena-sphalerite mineralization. Tourmalinite occurs as acicular disseminations in the fragmental footwall and also locally in the mineralized horizon and in the lowermost Middle Aldridge. There is often a clear strata control to tourmaline distribution. Sulfide stringer networks occur in the footwall of the "Sullivan Horizon" at Vulcan and have a sulfide and gangue mineralogy similar to that defined in the Sullivan vent system by Leitch (1991).

Strata-controlled pyrrhotite-galena-sphalerite occurs over a 7.5 m thickness at the main Vulcan showing, with the best section grading 1.6% combined Pb-Zn over 1.52 m. This is the only known location outside the Sullivan Mine area where strata-controlled Pb-Zn sulfides have been located on the LMC.

Drilled 1000 meters
"Deep" drilling proposed for '92

4.20 Kootenay King Mine (Cominco Ltd.)

The Kootenay King is located in the Rocky Mountains directly across the Rocky Mountain Trench from the Sullivan Mine. The Kootenay King Deposit produced 22,000 tons of 14% combined Pb-Zn and is a small stratiform sediment hosted massive sulfide deposit similar to Sullivan. This is the only place in the Aldridge Formation where significant high grade stratiform sulfides are believed to have been discovered outside the Sullivan Mine area. The orebody occurs in the top of a coarse sandstone horizon believed to represent a primary channel fill deposit on the upper contact of a large submarine fan unit. The deposit is situated within a platformal zone on the east side of the main Middle Aldridge turbidite basin. The deposit horizon is overlain by a regressive carbonaceous

mudstone sequence. There is no indication of the vent source for the sulfides at Kootenay King. The stratigraphic position of the deposit is in rocks equivalent to the upper part of the Middle Aldridge Formation. Fragmental units and geochemically anomalous (Pb-Zn) sulfide laminated mudstones occur along strike on the Kootenay King time horizon.

4.30 St. Eugene Mine (Cominco Ltd. - St. Eugene Mining Co.)

The mine is located south of the Moyie Fault on the east side of Moyie Lake. This steeply dipping 120° oriented vein type deposit produced over 1 million tons of Pb-Zn-Ag ore. The vein cuts the uppermost part of the Middle Aldridge Formation. The best ore shoots plunge along the intersection of bedding and the vein structure and are controlled by more brittle quartzite units. Conglomerate units flank the St. Eugene structure and may be related to early (penecontemporaneous) movement on that structure.

4.40 Vine Property (Cominco Ltd. - Kokanee)

This prospect is located just north of the Moyie Fault, at the north end of Moyie Lake. This is a vein type deposit and is very similar to St. Eugene, although minor gold is also present at Vine. The Vine vein cuts the LMC and extends into the lowermost Middle Aldridge Formation as well as the uppermost Lower Aldridge Formation. The best ore shoots are developed within brittle quartzite units in the Lower Aldridge. A thin zone of low grade Pb-Zn mineralization occurs on the LMC flanking the vein and is apparently of a stratiform nature. This sulfide zone resembles the distal eastern fringe of the Sullivan orebody.

4.50 Star Property (Kokanee)

The property is located between Yahk and Creston, B.C. A small argillite sub-basin has been defined within the lower to middle part of the middle Aldridge Formation. Low grade Pb-Zn sulfides of vein stockwork and possibly stratiform(?) types are widespread in the basinal facies. Tourmalinites are also associated with the mineralization.

4.60 Darling-Horn (Kokanee) - Minnova

The property is located near St. Mary Lake, to the west of the Sullivan Mine. Several bands of massive pyrrhotite up to 60 cm thick have been located and appear to be laterally extensive. The host is believed to be the Lower Aldridge Formation. Minor sphalerite occurs with the pyrrhotite and albite-chlorite alteration is also reported flanking the mineralization. The iron sulfides are believed to be stratiform in nature.

4.70 Estella Mine (Cominco Ltd.)

The Estella Mine is located north of Kootenay King in the same platformal sequence. It is a 120° striking massive sulfide vein similar to St. Eugene, cutting the upper to middle part of the middle Aldridge Formation. Tourmalinites locally flank the vein and suggest that the same structure was penecontemporaneous with Aldridge sedimentation and also formed a conduit for boron-rich hydrothermal fluids.

5.00 MIDDLE ALDRIDGE MARKER CONTROL

The Middle Aldridge Formation contains a series of varved (or laminated) marker horizons which form correlatable basin-wide time stratigraphic units. An understanding of the marker sequence is vital for exploration in the Aldridge, as the Middle Aldridge Formation consists of a monotonous 2,400 m thick turbidite sequence, and it has proven impossible to define stratigraphic positions without the markers.

Knowledge of the markers is required for the following purposes:

1) Correlating Middle Aldridge stratigraphy.
2) Locating fault off sets.
3) Predicting depth to the "Sullivan Horizon" and other target horizons to guide drill testing.
4) Locating areas of blind "Sullivan Horizon" targets within the range of drill testing.

Successful long term exploration in the Aldridge will require the compilation of a library of marker samples from outcrop and drill core sources. At present only Kokanee Resources Ltd. and Cominco Ltd. are believed to have comprehensive marker libraries. Over fifteen major marker horizons have been documented and named, the most important ones are listed from top to bottom as follows:

Marker Horizon	Distance above Sullivan Horizon
Shaft	1,420 m
Mat "R" Meadowbrook	
Ginty Sundown	960 m
Kid	
Moyie	
Butte Falls/Monroe	
Park Lamb	580 m
Hiawatha/Beehive	
Lois Creek	
Fringe	
LMC	0 m

6.00 PREVIOUS EXPLORATION

The Canadian exposure of the Aldridge Formation has been subject to a lengthy exploration history. Cominco Ltd. has spent over 30 years conducting reconnaissance and property evaluation programs from local branch offices.

Cominco's approach appears to have been geared towards finding another major deposit. The approach has been systematic, starting with regional geological mapping using marker control, followed by contour soil surveys and deep penetration electromagnetic (UTEM) surveys over areas

of exposed or shallowly buried Sullivan Horizon. The parameters used in evaluating the UTEM results are apparently based on a large Sullivan target and it has been observed that many smaller zones of mineralization do not produce good UTEM anomalies on the Cominco surveys and consequently were not followed up by Cominco. Examples include the Star and Vulcan occurrences. It is believed that smaller Sullivan type deposits (e.g. 50 million tons) will not be detected by previous UTEM surveys below approximately 300 m depth. It has also been observed that UTEM surveys produce strong anomalies on carbonaceous or graphitic horizons and on massive pyrrhotite-pyrite bands unrelated to Sullivan-type deposits. These strong anomalies may mask target responses in some areas, particularly when the strong conductors occur above the target horizon, as is the case in the Kootenay King area.

The Middle Aldridge Formation in the Purcell Mountain area has only become a serious focus of exploration in recent years, following the discovery of significant Middle Aldridge hosted Pb-Zn mineralization on the Star Property by Kokanee. The Lower Aldridge Formation has received very little exploration attention.

Previous exploration has generally featured a low diamond drill component (e.g. Cominco programs) and this has been detrimental to target development and geological modelling. Recent drill oriented programs by junior exploration companies (e.g. Vulcan - Ascot Resources and Star - Kokanee Resources) have started to redress this drilling imbalance. In both cases, drilling of geologically defined targets with low priority geophysical responses has led to delineation of potential ore hosting sub-basins containing Pb-Zn mineralization and other Sullivan type mineral indicators. This new geological information has in turn led to a re-assessment of the previous negative geophysical results and to proposals for deep drill testing and downhole geophysics supported by established Aldridge geophysical workers.

7.00 TENURE CONSTRAINTS

During a long history of surface exploration, many different mineralized showings and mineral indicator targets have been developed within a large area. All of these showings and most of the other indicators are covered by claims and there is often a broad zone of peripheral staking around key claims.

Establishing a new property position with a defined target is likely to involve negotiating deals with existing property owners. The primary property owners are Cominco Ltd. and Kokanee Resources Ltd. Both of these companies are favourably disposed to joint venture proposals, provided work programs are conducted by qualified Aldridge workers. The author maintains good relationships with the personnel of both companies and is personally available for field programs. This combination of contacts and training was an important factor in the successful conclusion of the Vulcan Joint Venture negotiations between Ascot Resources Ltd. and Cominco Ltd.

8.00 RESEARCH PROPOSAL

8.10 Staff

Ian D. McCartney, P.Eng. - Geological Consultant

8.20 Duration

Three months.

8.30 Work Program

The research phase of the project will be conducted in Vancouver. Property acquisition opportunities will be developed for the client company over the entire Canadian exposure of the Aldridge Formation. A complete review of currently available property submittals will be undertaken on behalf of the client, and the properties of best potential will be followed up by a review of all available geological information as well as assessment reports. A compilation of Aldridge mineral indicators, geology and mineralization will be constructed and the current tenure status defined over areas of interest. A field phase of the project will also be conducted to verify the geology and mineral indicators on the target properties for the client company. This work cannot be undertaken until spring (May). The most attractive opportunities for ground acquisition will be determined by favourable geology and mineral indicators as well as the ease and cost of assembling a land position. Open ground identified as high priority during the research can be staked anonymously for the client company if required.

Should suitable opportunities be defined, Keewatin Engineering Inc. would be prepared to use its contacts and experienced Aldridge staff to perform more advanced evaluations, or to assist the client company in acquiring the desired land position. Keewatin would also be prepared to conduct the Year 1 work program on acquired properties or projects.

8.40 Budget

The following budget estimate applies to the research and compilation phase of the study.

Personnel		
D.G. DuPre	2 days @ $400/day	
I.D. McCartney	50 days @ $325/day	$17,050
Communications		200
Photocopying, Reproduction and Publications		500
Drafting	20 hrs @ $ 40/hour	800
Travel (1 return trip to Cranbrook)		500
Travel Expenses (estimate)		500
TOTAL:		**$19,550**

The field follow-up budget is estimated as follows:

Personnel		
I.D. McCartney	10 days @ $325/day	$3,250
D.G. DuPre	2 days @ $400/day	800
Travel		500
Expenses (est.)		1,000
TOTAL:		**$5,550**

9.00 REFERENCES

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APPENDIX I

Statement of Qualifications

STATEMENT OF QUALIFICATIONS

I, IAN DOUGLAS McCARTNEY, of 2242 Spruce Street in the City of Vancouver in the Province of British Columbia, do hereby certify that:

1. I have extensive field experience in the Sullivan Camp, primarily with Cominco Ltd. as follows:

   Aug. - Nov., 1991 — The author initiated a deal between Ascot Resources Ltd. and Cominco Ltd. on the Vulcan Property, and planned and conducted a 1,000 m diamond drill and downhole UTEM program which defined the setting of mineralization and indicated attractive deep Sullivan targets. The program was conducted by Keewatin Engineering Inc.

   June - Oct., 1990 — As a consulting geologist for Cominco Ltd., supervised reconnaissance and property evaluation programs in the Star Property area, Upper Moyie River area and the St. Marys Block.

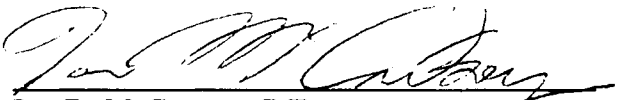
   Apr. '77 to Feb. '81 — As a staff geologist for Cominco Ltd. the author supervised regional exploration projects in the Yahk-Creston area, the Findlay Creek-Doctor Creek Block, the St. Marys Block, the Kootenay King and Estella areas and in the U.S. part of the belt. The author also supervised property evaluation projects at the Kootenay King property, Vine property, Mt. Mahon property, Doctor Creek property, Vulcan property, Clair property and the St. Eugene property. This work included three months of underground mapping at the Sullivan Mine.

2. I am a graduate of Queens University, Kingston, Ontario with an Engineering Degree (B.Sc.) in Geology (1976).

3. I am a Member in good standing of the Association of Professional Engineers of the Province of British Columbia and a Member in good standing of the Institute of Mining and Metallurgy.

Dated in Vancouver, British Columbia this 9th day of January, A.D., 1992.

Respectfully submitted,



Ian D. McCartney, P.Eng.