81-#727 - 10042

Part 1 of 4

ORE RESERVES OF
THE NORTH STAR AND WOLF DEPOSITS
HELD BY DOLLY VARDEN MINERALS INC.
KITSAULT VALLEY, BRITISH COLUMBIA

VOLUME 1 /4

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Toronto, Ontario
February 15, 1981

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SUMMARY OF RESERVES

NORTH STAR AND WOLF DEPOSITS

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NORTH STAR AND WOLF DEPOSITS

(11 cu.ft./ton; corrected for mined-out ore)

	Proven & Probable		Possible	
	Tons (short)	Grade (oz.Ag/ton)	Tons (short)	Grade (oz.Ag/ton)
NORTH STAR DEPOSIT				
Undiluted Reserves	122,080	13.35	-	-
Dilution - 16.0%	19,497	1.44	-	-
Diluted Reserves	141,577	11.71	-	-
WOLF #1 DEPOSIT				
Undiluted Reserves	74,700	12.98	-	-
Dilution - 15%	11,205	1.70	-	-
Diluted Reserves	85,905	11.52	-	-
WOLF #2 DEPOSIT				
Undiluted Reserves	209,450	9.34	96,136	9.12
Dilution - 15%	31,418	1.70	14,420	1.70
Diluted Reserves	240,868	8.34	110,556	8.15
TOTAL RESERVES				
North Star and Wolf Deposits	468,350	9.94	110,556	8.15
Contained Silver	4,655,399 oz. Ag		901,031 oz. Ag.	

1.0 INTRODUCTION

1.0 INTRODUCTION

At the request of Dolly Varden Minerals Inc. (DVM), Derry, Michener & Booth (DMB) has completed an independent review and estimation of mineable ore at two silver deposits, the North Star and the Wolf, owned by the Company in the Kitsault Valley district of British Columbia.

These deposits were explored and partially developed by Torbrit Silver Mines during the period 1949-1959 when mining operations were under way on the Torbrit orebody. The significant increase in the price of silver in the past 18-24 months has justified detailed study of the economics of exploiting these deposits.

In 1979/80 DMB carried out a preliminary evaluation of these silver deposits for DVM which formed the basis for a development programme partially undertaken in 1980 to investigate the feasibility of carrying out a 300 ton per day underground mining operation for six months per year based on an estimated 5-year life of the mineable reserves.

In 1980, as part of the development programme, DMB supervised a programme of check drilling and sampling on selected high-grade portions of the North Star and Wolf deposits and this report incorporates the information gained during this underground diamond drilling programme. Mineable ore reserves for the North Star, which had been initially calculated using a cut-off grade of 8 oz. Ag/ton, were subsequently

re-estimated using a 4 oz./ton cut-off since it became apparent that this was a more natural cut-off grade and would be more significant in terms of maximizing operating profits.

Our review and estimation has been carried out in conjunction with a feasibility study currently being prepared by Wright Engineers Limited.

2.0 LOCATION, ACCESS AND PROPERTIES

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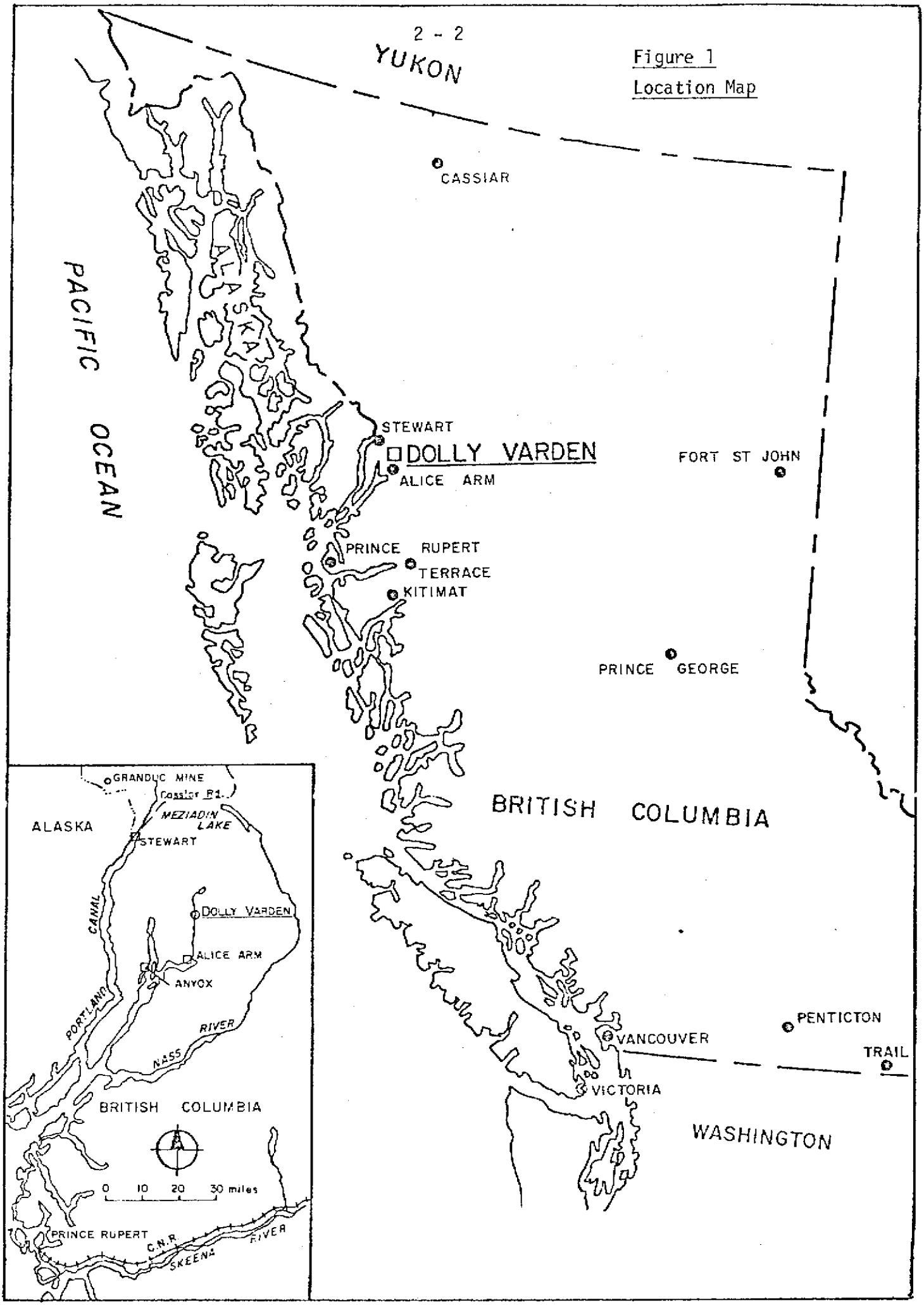
2.1 LOCATION AND ACCESS

The properties held by Dolly Varden Minerals Inc. straddle the Kitsault River over a 9-mile length, from 16 to 25 miles upstream from the coastal settlement of Alice Arm, British Columbia. Alice Arm and the recently activated Climax Molybdenum Mine at Kitsault, 1 1/2 miles across the Arm, are serviced from Prince Rupert, 85 miles to the south. Daily passenger and light freight service is provided by Transprovincial Grumman Goose, or other float aircraft. Weekly barge service is also provided (Fig. 1).

At present we understand that surveying is complete for a proposed road which would link Kitsault with the Nass River Road. A microwave telephone system and power line already join Kitsault with outside communities.

The old mine road from Alice Arm extending through the property to the Torbrit Mine power station, and last used in 1973, had degenerated to a footpath by 1979 with only one bridge remaining just south of the Torbrit portal. Development during 1980 included the rehabilitation of this mine road from Alice Arm to the Torbrit bridge.

Figure 1
Location Map



2.2 PROPERTIES

The properties are located at Latitude 55°42'N; Longitude 129°31'W (N.T.S. 103P/12 and 103P/11) and comprise:-

Crown Grants: 934, 935, 936, 937, 3192, 3193, 3194, 3195 3196, 3197, 3198, 3634, 3794, 3795, 3796, 3797, 3798, 3806, 3807, 3808, 3809, 3810, 3814, 3815, 3816, 3818, 3819, 3825, 3826, 3827, 4066, 4067, 4068, 4069, 4070, 4071, Tiger, Lion and Plutus Fraction - no number, 4211, 4217, 4265, 4335, 4336, 4337.

Claims: Fr. 4260, 14218, 15347, 15348, 15311, 19605, 19607, 19609, 15604, 15806, 15807, 15808, 15809, 21159, 21160, 21161, 21162, 21333, 21334, 21735, 28821, 28822, 28823, 28824, 28825, 28826, 28827, 28828, 33523, 33524, 33525, 33526, 33528, 35410, 35411, 35412, 35413, 35414, 35415.

Licenses: L22-941, L22-942, L38-4213, L38-4214, L38-4215, L57-3802, L57-3803, L57-3804, L57-3805, L36-3519, L39-3828, L40-4263, L41-4202.

In addition to this DVR owns a company house and several lots in the settlement of Alice Arm. DMB has not confirmed the title to these properties, which are shown on the accompanying Claim Map.

These properties include the formerly mined Torbrit deposit, the Wolf and the North Star deposits, and numerous other silver prospects. Of these, the principal ones are the old Dolly Varden Mine, the Wolf No. 3, Moose-Lamb, Tiger, Kitsol, V and Mitchell veins and the Surprise Showing.

Our review is confined to the North Star and Wolf No. 1, 2 and 3 deposits which are the object of the current feasibility study.

3.0 HISTORY OF EXPLORATION AND OPERATIONS

3.0 HISTORY OF EXPLORATION AND OPERATIONS

Over 20 million ounces of silver and 10 million pounds of lead have been produced from the Torbrit and Dolly Varden Mines with a calculated average recovered grade of 14.18 oz. Ag/ton and 7.8 lbs. Pb/ton. A summary of production is shown in Table 1.

Table 1

Metal Production in Kitsault Valley 1919-1959

Property	Period	Short Tons of Ore Produced	Production	
			Oz. Silver	Lbs. Lead
Dolly Varden Mines Co.	1919-1921	36,600	1,305,000	(none reported)
Torbrit Silver Mines Ltd.	1949-1959	1,377,800	18,759,000	10,800,000
		1,414,400	20,064,000	10,800,000

Dolly Varden ore was mined selectively and shipped without beneficiation to base metal smelters, mainly to the Anyox Copper Smelter of Granby Mines. The Torbrit ore was milled on the property for the production of a high-grade silver-lead concentrate and silver bullion. No other mining properties in the Upper Kitsault Valley have any recorded production.

Numerous mineral showings, on which a variety of development drilling, trenching and tunneling has been completed, occur throughout the area. The majority of these showings were discovered in the period between the First and Second World Wars by individual and small company prospecting; as a result exploration records are minimal.

In this period a great number of small copper-gold-silver veins and pods, associated with a rusty pyrite-rich zone on the east ridge of a diorite intrusive, were found and explored. None of these "Copper Belt" showings have the continuity in grade and tonnage of the silver-lead veins.

During the 10-year operation of the Torbrit Mine, systematic exploration, drilling and initial development was carried out on several prospects, including the North Star and the Wolf veins. However, by the time the Torbrit reserves were nearly exhausted, it was decided that it was not economical to extend operations to other prospects.

Dolly Varden Mines, the predecessor company to Dolly Varden Minerals Inc., explored the district from 1969 to 1973 under the field direction of M. A. Mitchell, company geologist. This exploration consisted of regional geological mapping, the drilling of numerous veins, including extensions of the Dolly Varden vein, and soil geochemical surveys over most of the Copper Belt showings on the west side of the Kitsault Valley and on seven claims on the east side of the valley between Tiger and Wolverine Creeks and south of the Wolf mine. During this period the Mitchell vein was found by prospecting and confirmed by a geochemical survey.

In 1978, Derry, Michener & Booth completed a 3-month programme of prospecting and soil geochemical surveys over the remaining mining properties not sampled by Mitchell in 1973. However, no significant additional mineralized veins were located.

In 1979 DMB carried out a preliminary economic evaluation of mining and milling DVM's Kitsault Valley silver deposits. This study included an independent estimation of the mineable reserves of the North Star deposit and a general review of ore reserves of the Wolf 1 and Wolf 2 deposits previously estimated by the company in 1969 and checked by Wright Engineers Ltd. in 1977.

4.0 REGIONAL GEOLOGY, STRUCTURE AND MINERALIZATION

4.0 REGIONAL GEOLOGY, STRUCTURE AND MINERALIZATION

4.1 GEOLOGY (Refer to Regional Geology Map, Vol. 3)

The Dolly Varden properties lie near the center of a 40-mile by 15-mile panel of Lower Jurassic volcanic and sedimentary rocks of the Hazelton Assemblage which have been intruded by the Glacier Creek diorite and granodiorite stocks of Cretaceous and/or Tertiary age. To the west the panel is bounded by Tertiary felsic plutons of the Coast Crystalline Belt, and to the east and south by Middle and Upper Jurassic marine sediments of the Bowser Assemblage.

The Hazelton Assemblage is regionally folded along NNW-trending and somewhat arcuate axes. The area has been one of almost continuous tectonic activity since Jurassic times and the folding, uplift and erosion have formed linear belts of volcanic and sedimentary rocks which parallel the axis of the Tertiary plutons.

NE-trending faults and younger, NNW-trending, strike-slip and thrust faults and NE-trending mafic dyke swarms complicate the structure on both regional and local scales.

The Hazelton Assemblage consists of about 4,500 m. of inter-stratified and interfingering clastic and pelitic sedimentary rocks and mafic volcanic breccias, tuffs and flows all of Jurassic age. These were deposited at a time of periodic vulcanism resulting in wedging, lensing and mixing of members and accompanied by rapid changes in colour and texture.

At least three periods of vulcanism have interrupted the sedimentation and therefore the assemblage has been subdivided into three volcanic and two sedimentary members as shown in Table 2.

The majority of the silver-lead veins occur within volcanic epiclastic member "B" which consists of massive, fine-grained tuffs with little sign of bedding but with rapid changes in colours from green to brown to purple. The beds are about 3,000 ft. thick and are intruded by younger mafic dykes and by a few small felsic stocks.

In the vicinity of the silver-lead veins the rock is silicified and propylitized.

Table 2

Upper Kitsault Valley Formations

Tertiary?		Dykes of andesitic composition
		Intrusive Contact
Cretaceous?	Glacier Creek Intrusions	Diorite-Granodiorite Intrusive
		Intrusive Contact
Jurassic?	Hazelton Assemblage	Youngest volcanic member "D" - fine grain tuffs, gritty tuffs thickness not known
		Sedimentary member "C" - argillaceous sediments, fossiliferous sandstone thickness 500'+?
		Volcanic, epiclastic member "B" - massive fine grained tuffs, breccia SILVER-LEAD-ZINC BEARING thickness 3,000'?
		Oldest sedimentary member "A" - argillite, tuffs, conglomerate, greywacke thickness 500-1,000'
		Local Unconformity?
		Oldest volcanic member - grey rhyolitic breccia, hornblende, porphyry, tuff, massive mafic volcanics thickness not known

4.2 STRUCTURE AND METALLOGENY

The Hazelton Assemblage occupies a synform whose axis trends NNW parallel to the Kitsault River. The axis of a complementary antiform lies about 2 miles east of the valley. About 3 miles south of the Torbrit Mine the synform is arched along a northeast axis which causes it to plunge north-northwesterly over the properties.

The Hazelton rocks are intruded by a diorite to granodiorite body, 4 miles long and 1 mile wide, whose east margin lies near the axial plane of the synform. Thick, rusty, pyritic rhyolite flows occur near this margin. This epizonal pluton, although dated as Cretaceous/Tertiary by Carter (1971), is thought to be related to the source of the Hazelton volcanics and to the mineralization in the district, since the mutual contacts are gradational.

The transition from gradational contacts (between the intrusives and the Hazelton volcanics on the west margin) to an abrupt contact (on the east margin) is thought to indicate an eastward movement of a volcanic vent with the east margin representing a periodically active fissure zone.

Two sets of major faults, trending northeast and northwest, dominate the topography. The dextrally-displaced northeast set represents normal fault displacement whereas the sinistrally-displaced northwest set represents cross-cutting strike slip/thrust faulting. Thin diabase and lamprophyre dyke swarms occupy many of the northeast fault trends. Some of the silver-bearing veins, particularly the Wolf,

parallel the northeast fault set. However, within these veins the extent of mineralization is reported to be controlled by the displacement and attitude of the cross-cutting northwest fault set.

4.3 MINERALIZATION

Mineral veins on the Dolly Varden properties occur as:-

(a) Quartz-carbonate-pyrite with minor chalcopyrite. Textures are simple and the wall rocks are commonly propylitized. These are assumed to be first generation mesothermal veins.

(b) Crustiform and colloform galena, argentiferous galena, sphalerite, marcasite, pyrargyrite and native silver occurring within quartz-calcite and barite gangue. Wall rock alteration is minor. Barite appears to be associated with the better lead and zinc values.

These are assumed to be second generation epithermal veins and constitute the economic mineralization of the district, i.e. Dolly Varden, Torbrit, Wolf, North Star, Mitchell, and Silver Horde.

Mitchell (1973) has suggested that the mineralization is structurally controlled and related to a ring-dyke complex and that much of the first generation mineralization was replaced by epithermal mineralization emanating from a volcanic vent area along favourable beds, primarily in the lower volcanic, volcanic-epiclastic member "B".

5.0 SUMMARY OF GEOLOGY, MINERALIZATION AND RESERVES OF NORTH STAR DEPOSIT

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5.1 GEOLOGY

DVM initially plan to develop a high-grade central block of the North Star deposit, situated above the 1025 adit level, and lying approximately between 6400E and 6900E and 6100N and 6600N (Mine Sections 775W to 1075W).

At DVM's request, DMB has calculated reserves of this area, details of which are provided in Appendix A of this report. The main features of this report are summarized below.

The geology and mineralization of the North Star deposit have been outlined by a combination of about 23,970 ft. of surface and underground diamond drilling and about 1,965 ft. of underground development.

The area is underlain by massive porphyritic lavas, agglomerates and tuffs of Formation B of the Hazelton Formation. These volcanic rocks are variably coloured from light to dark green, purple and gray. The colouration is often banded and/or mottled and generally appears to relate to alteration in the rocks. In the vicinity of the mineralization the major alteration, however, is silicification and pyritization.

5.2 MINERALIZATION AND RESERVES

The geometry of mineralization appears simple with the higher grade silver forming a fairly uniform lens varying from 5 ft. to 32 ft. thick, up to 350 ft. along strike, and 350 ft. wide, within a quartz-barite-calcite vein which dips approximately 45^{o} to the northwest. The major silver minerals are pyrargyrite, native silver and argentiferous galena. These are accompanied by pyrite, sphalerite, galena, chalcopyrite and marcasite. The total lead content may average about 2% and zinc up to 3%.

The boundaries of the high-grade lens are not completely defined but are, at least in part, the result of faulting. Several faults also intersect the high-grade lens and may disrupt the apparent continuity of the mineralization.

During the original development of the North Star nearly 1,000 samples were taken for silver assaying. Subsequent check assaying in 1974 indicated that these assays are an acceptable basis for a reserve calculation.

DMB has calculated the undiluted reserves of the high-grade block, based on a cut-off of 4 oz./ton Ag over a minimum thickness of 5 ft. on section and a tonnage factor of 11 cu.ft./ton.

5.3 TABULATION OF RESERVES

The undiluted and diluted reserves of each block, subtotaled by section, are listed in Table 3 and the reserves by section are summarized in Table 4.

The total, undiluted reserves are estimated at 122,080 tons, grading 13.35 oz. Ag per ton.

Dilution is estimated at 19,497 tons at a grade of 1.44 oz. Ag per ton, representing 16.0% of the undiluted tonnage. Hence, the total diluted reserves are estimated at 141,577 tons at a grade of 11.71 oz. Ag per ton.

Although we have not examined in detail the lead and zinc content in the reserves, from previous calculations on the North Star deposit, it appears that lead could comprise up to 2% and zinc up to 3% of the reserves of the high-grade block.

Table 3

DOLLY VARDEN MINERALS INC.

ORE RESERVES OF THE NORTH STAR DEPOSIT

TABULATION BY SECTION AND BLOCK

Cross Section No.	Block No.	Undiluted Reserves Grade Oz. Ag/ton	Undiluted Reserves Tons (Short)	Undiluted Reserves Metal (Oz. Ag)	Diluted Reserves Grade Oz. Ag/ton	Diluted Reserves Tons (Short)	Diluted Reserves Metal (Oz. Ag)
775W	U20	11.08	254.5	2,819.9	-	290.9	-
	R3U	12.91	1,563.6	20,186.1	-	2,032.7	-
	R3L	8.40	957.1	8,039.6	-	1,196.4	-
Sub-Total & Average		11.19	2,775.2	31,045.6	8.95	3,520.0	31,500.0
840W	U46	9.38	1,352.5	12,686.0	-	1,632.3	-
	U98	13.48	1,543.6	20,808.2	-	2,006.7	-
	U99	15.10	1,970.6	29,756.7	-	2,467.4	-
	U100U	9.63	387.3	3,729.7	-	503.5	-
Sub-Total & Average		12.75	5,254.0	66,980.6	10.31	6,609.9	10.31
890W	R4	12.53	779.1	9,762.1	-	902.11	
	U43U	12.15	1,025.0	12,453.8	-	1,332.5	-
	U43L	17.30	2,867.5	49,607.8	-	3,145.0	-
	U45	15.71	6,417.5	100,818.9	-	7,055.0	-
	U49	10.46	5,901.8	61,732.6	-	7,066.6	
	U50	28.01	2,180.0	61,061.8	-	2,834.0	-
	U62E	8.49	2,424.5	20,584.0	-	2,684.3	-
Sub-Total & Average		14.63	21,595.4	316,021.0	12.87	25,019.5	322,047.4
950W	U42U	11.97	1,450.0	17,356.5	-	1,750.0	-
	U42L	11.39	1,012.5	11,532.4	-	1,316.2	-
	U48	12.91	12,135.1	156,663.9	-	13,562.8	-
	U75	7.19	7,000.0	50,330.0	-	8,312.5	-
	U78	8.67	15,334.1	132,946.6	-	16,893.5	-
	U62W	8.49	2,424.5	20,584.4	-	2,684.3	-
Sub-Total & Average		10.42	39,356.2	389,413.8	8.89	44,519.3	395,712.8
1000W	U44	10.34	5,090.3	52,634.1	-	6,075.5	-
	U60	10.65	4,916.9	52,364.8	-	5,534.1	-
	U61	30.43	8,493.2	258,448.1	-	9,754.6	-
	U69	17.17	3,528.4	60,582.6	-	4,116.5	-
	U79	9.80	3,642.9	35,700.1	-	4,267.4	-
	U93	14.56	2,460.3	35,821.6	-	2,840.8	-
	U94	13.55	2,621.3	35,519.0	-	3,024.6	-
	U95	32.56	2,134.4	69,494.4	-	2,522.5	-
	U96	7.31	3,202.4	23,409.6	-	3,546.7	-
	U97	13.00	1,071.5	13,929.8	-	1,316.9	-
Sub-Total & Average		17.17	37,161.6	637,904.1	15.07	42,999.6	648,003.8
1075W	U54	6.71	1,941.7	13,028.8	-	2,315.1	-
	U56	14.52	3,907.5	56,736.9	-	4,435.5	-
	U57	8.70	3,350.9	29,152.8	-	4,124.2	-
	U73-74	14.38	5,059.1	72,749.8	-	5,697.5	-
	U77	10.09	1,678.3	16,934.2	-	2,136.0	-
Sub-Total & Average		11.83	15,937.5	188,602.5	10.19	18,908.3	192,672.5
TOTAL & AVERAGE		13.35	122,080	1,629,968	11.71	141,577	1,658,056

Table 4

DOLLY VARDEN MINERALS INC.

DRILL-INDICATED (PROBABLE) RESERVES OF THE NORTH STAR DEPOSIT

ABOVE 1025' LEVEL

(Based on a Cut-Off of 4.0 oz. Ag/5.0 ft. Minimum Mining Thickness on Section)

	UNDILUTED RESERVES			DILUTION			DILUTED RESERVES		
Section	Tonnage (sh. tons)	Metal Content oz. Ag	Grade oz. Ag/ton	Tonnage (sh. tons)	Metal Content oz. Ag	Grade oz. Ag/ton	Tonnage (sh. tons)	Metal Content oz. Ag	Grade oz. Ag/ton
775W	2,775.2	31,045.6	11.19	745.0	454.4	0.61	3,520.0	31,500.0	8.95
840W	5,254.0	66,980.6	12.75	1,355.9	1,139.0	0.84	6,609.9	68,119.6	10.31
890W	21,595.4	316,021.0	14.63	3,424.1	6,026.4	1.76	25,019.5	322,047.4	12.87
950W	39,356.2	389,413.8	10.42	5,163.1	6,299.0	1.22	44,519.3	395,712.8	8.89
1000W	37,161.6	637,904.1	16.85	5,838.0	10,099.7	1.73	42,999.6	648,003.8	15.07
1075W	15,937.5	188,602.5	11.83	2,970.8	4,070.0	1.37	18,908.3	192,672.5	10.19
TOTALS & AVERAGE	122,080	1,629,968	13.35	19,497	28,089	1.44	141,577	1,658,056	11.71

Average dilution: 16.0% @ 1.44 oz. Ag/ton.

5.4 CATEGORIZATION OF RESERVES

The high-grade section of the North Star deposit has been defined and sampled by 30 holes and 2 raises with intersections up to 100 ft. apart. Core recovery in these holes was satisfactory and independent check assaying of duplicate samples has confirmed the general validity of the chemical analyses.

Our correlation of geology and mineralization indicates that the three dimensional continuity of the mineralization is reasonably well established and provides an appropriate base for this reserve calculation, which we are of the opinion meets the criteria for classification as "Drill-Indicated" or "Probable" ore.

6.0 SUMMARY OF GEOLOGY, MINERALIZATION AND RESERVES OF WOLF DEPOSIT

6.0 SUMMARY OF GEOLOGY, MINERALIZATION AND RESERVES OF WOLF DEPOSIT

6.1 GEOLOGY AND MINERALIZATION

DVM plans to exploit the Wolf deposit by open stoping using trackless mining techniques.

We have completed an independent assessment of the deposit and have estimated the Proven, Probable and Possible reserves based upon the Company's assay plans, sections, drill hole logs and previous ore reserve estimates made by M. A. Mitchell (1973) for the Company which was subsequently reviewed by Wright Engineers (1977).

The Wolf claims are underlain by massive flows and pyroclastic rocks of Formation B of the Lower Jurassic Hazelton Formation.

The deposits comprise three veins which strike northeast and dip steeply to the northwest. These veins, which vary in width from 20 ft. to 52 ft., are believed to be segments of a single vein that has been offset by two faults striking due east and dipping 45^{0}S and a third fault striking northwest and dipping 60^{0}.

In contrast to the North Star deposit, the veins dip close to the vertical and this should allow a marked improvement in mining costs and in control of hanging wall dilution.

The veins are complexly and variably mineralized; pyrargyrite and native silver are the main silver minerals occurring within a gangue of quartz, carbonate and barite. The Wolf deposits contain little lead.

The erratic distribution of the high-grade mineralization is such that it can only be successfully exploited by mining the complete vein. The 1980 check diamond drilling programme has shown this assumption, made previously by DVM and ourselves, to be valid.

Two of the vein segments, Wolf #1 and Wolf #2, have been partially developed and explored by about 900 ft. of drifting and 12,000 ft. of underground, ring percussion drilling. In addition there are 21 surface diamond drill holes and 23 underground drill holes. It is these two segments that DVM plans to mine.

6.2 RESERVES

Data for the Wolf #3 vein and for the #2 vein below the 1,000 ft. elevation are insufficient for calculation of ore reserves at this time and further development and drilling will be required.

In the Company's ore reserve estimates, sludge samples from percussion drilling, channel samples from drifting and core samples from diamond drilling were used. Although check assays by Chapman, Wood and Griswold (1969) had indicated that the original assays were acceptable for reserve calculation, the adequacy of the sludge sampling was thought to be somewhat suspect. As a result, a programme of 17 holes was drilled in 1980 on three of the percussion rings and beside each of the holes on the rings to compare grade from both types of samples. This check drilling programme clearly demonstrated that although the average grades from percussion and split core could vary substantially, the average grade for all holes in each ring was essentially identical using either data sheet.

6.2.1 Wolf #1 Deposit

The Wolf #1 vein, the smaller of the two segments, has been adequately explored by a raise from the 1450 level to the 1550 elevation and a subdrift driven on this level through the deposit. The proven and probable reserves, based upon a tonnage factor of 11 cu.ft. per ton and derived from a longitudinal section prepared by Mitchell (1973), are:-

74,700 tons @ 12.98 oz. Ag/ton.

A reproduction of part of the longitudinal section is provided in Figure 2 and reserves are summarized in Table 5. Wright Engineers Ltd. are presently developing a mining plan for the Wolf deposits. In the case of the #1 vein, the main portion of the reserves are mineable, subject to minor confirmatory drilling in the stope preparation phase. Blocks 1250D and E and blocks 1200C and D below the 1450 adit level will require additional development.

On the advice of W.E.L. we have made no allowance for mining recovery since this estimation will be provided by them.

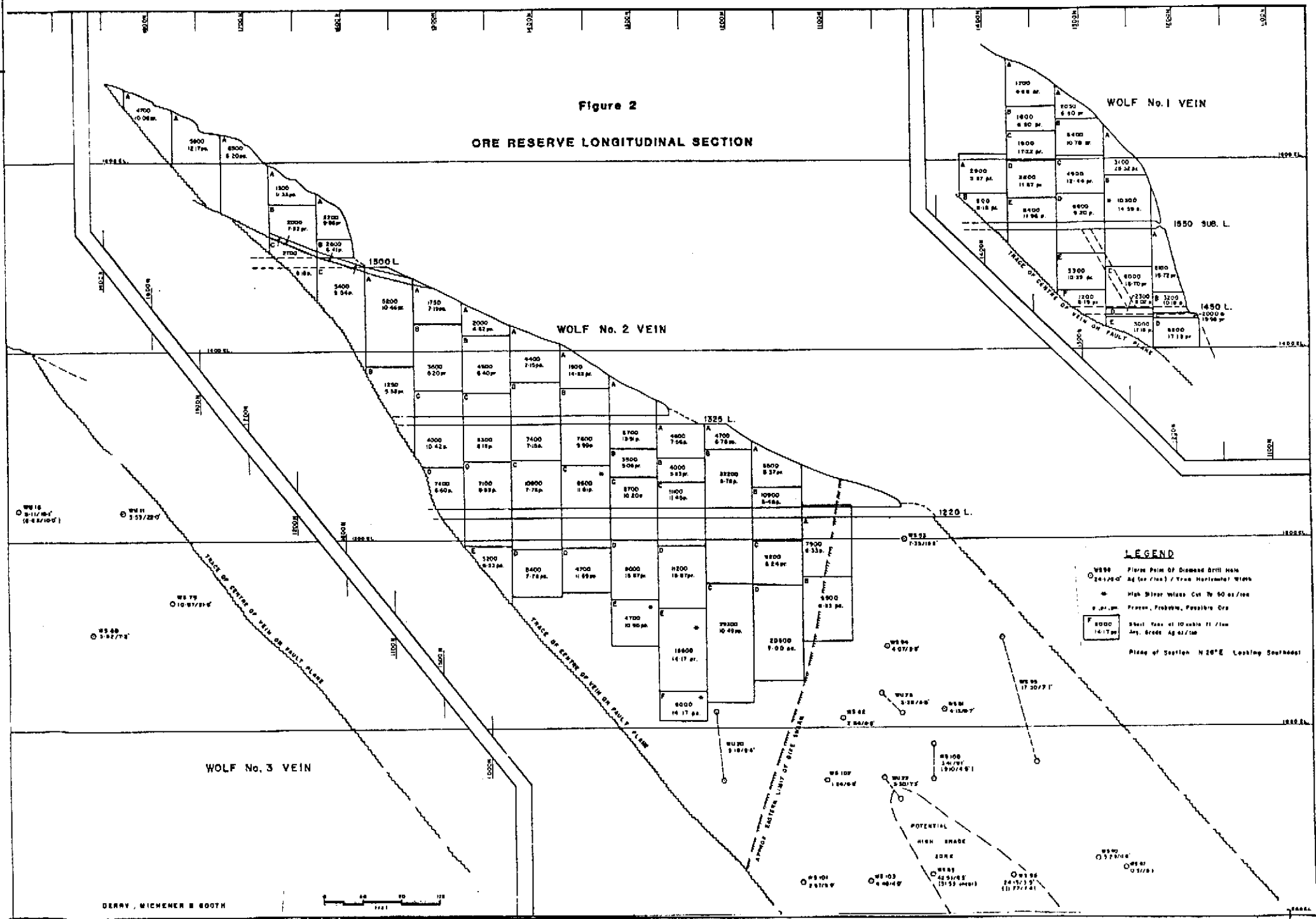
Dilution has been assessed at a total of 15% from both walls at a grade of 1.65 oz. Ag/ton over a length of 1.47. This has been rounded to 1.70 oz. Ag/ton to match the grade of dilution in the Wolf #2 vein. Accordingly, the proven and probable reserves, after dilution, of the Wolf #1 deposit are estimated at:-

85,905 tons @ 11.52 oz. Ag/ton.

B. & C. LTD.

Figure 2

ORE RESERVE LONGITUDINAL SECTION



DERRY, MICHENER & BOOTH

Table 5

DOLLY VARDEN MINERALS INC.

Proven And Probable Ore Reserves Of The Wolf No. 1 Vein

Tabulation By Section And Block
(10 cu.ft./ton; undiluted)

Cross Section No.	Block No.	Undiluted Reserves Grade Oz. Ag/Ton	Tons (Short)	Metal (Oz. Ag)
1200N	A	15.72	5,100	80,172
	B	10.18	3,200	32,576
	C	15.99	2,000	31,980
	D	17.18	6,600	113,388
Sub-Total & Average		15.27	16,900	258,116
1250N	A	25.32	3,100	78,492
	B	14.59	10,300	150,277
	C	16.70	6,000	100,200
	D	8.02	2,300	18,446
	E	17.18	3,000	51,540
Sub-Total & Average		16.15	24,700	398,955
1300N	A	6.80	2,050	13,940
	B	10.78	5,400	58,212
	C	12.44	4,900	60,956
	D	9.20	6,300	62,560
	E	10.39	3,300	34,287
	F	8.19	1,200	9,828
Sub-Total & Average		10.14	23,650	239,783
1350N	A	4.68	1,700	7,956
	B	6.80	1,600	10,880
	C	17.22	1,900	32,718
	D	11.67	2,800	32,676
	E	11.96	6,400	76,544
Sub-Total & Average		11.16	14,400	160,774
1400N	A	5.87	2,900	17,023
	B	8.15	900	7,335
Sub-Total & Average		6.41	3,800	24,358
TOTAL & AVERAGE @ 10 cft		12.97	83,450	1,081,986
@ 11 cft		12.97	75,864	983,956
Mined-Out Ore		12.50	1,164	13,386
Total @ 11 cft		12.98	74,700	970,353

6.2.2 Wolf #2 Deposit

The #2 vein has been explored and partially developed by three adits at elevations of 1,220, 1,325 and 1,500 ft. Ring percussion drilling was undertaken on all three levels and in addition substantial surface and underground diamond drilling was completed.

A higher-grade area occurs between sections 1350 and 1250 and extends from an elevation of about 1,050 ft. to the surface at about 1,400 ft. The reserves for the Wolf #2 deposit, based upon the Mitchell longitudinal section and calculated at a tonnage factor of 11 cu.ft. per ton, as shown in Figure 2 and summarized in Table 6, are:-

Proven & Probable:	209,450 tons @ 9.34 oz. Ag/ton.
Possible:	96,136 tons @ 9.12 oz. Ag/ton.

The majority of the Wolf #2 vein is readily mineable; however, the lower levels of the deposit will require additional development and confirmatory drilling during the stope preparation phase.

Table 6

DOLLY VARDEN MINERALS INC.

Proven And Probable Ore Reserves Of The Wolf No. 2 Vein

Tabulation By Section and Block
(10 cu.ft./ton; undiluted)

Cross Section No.	Block No.	Undiluted Reserves Grade Oz. Ag/Ton	Tons (Short)	Metal (Oz. Ag)
1100N	A	6.33	7,900	50,007
1150N	A	8.37	5,500	46,035
	B	5.48	10,900	59,732
	C	6.24	9,200	57,408
Sub-Total & Average		6.37	25,600	163,175
1200N	B	6.78	32,200	218,316
1250N	A	7.56	4,600	34,776
	B	5.93	4,000	23,720
	C	11.45	11,100	127,095
	D	15.67	11,200	175,504
	E	14.17	16,600	235,222
Sub-Total & Average		12.55	47,500	596,317
1300N	A	13.91	6,700	93,197
	B	5.05	3,500	17,675
	C	10.20	8,700	88,740
	D	15.67	9,000	141,030
Sub-Total & Average		12.21	27,900	340,642
1350N	A	14.82	1,900	28,158
	B	9.99	7,600	75,924
	C	11.61	8,600	99,846
		11.27	18,100	203,928
1400N	B	7.15	7,400	52,910
	C	7.78	10,900	84,802
Sub-Total & Average		7.53	18,300	137,712

Table 6
(Continued)

Cross Section No.	Block No.	Undiluted Reserves Grade Oz. Ag/Ton	Tons (Short)	Metal (Oz. Ag)
1450N	B	6.40	4,500	28,800
	C	8.13	6,300	51,219
	D	6.53	7,100	46,363
Sub-Total & Average		7.06	17,900	126,382
1500N	B	8.20	3,600	29,520
	C	10.42	4,000	41,680
	D	6.60	7,400	48,840
Sub-Total & Average		8.00	15,000	120,000
1550N	A	10.46	5,200	54,392
	B	5.58	1,250	6,975
Sub-Total & Average		9.51	6,450	61,367
1600N	A	9.98	3,200	31,936
	B	6.41	2,600	16,666
	C	9.54	5,400	51,516
Sub-Total & Average		8.94	11,200	100,118
1650N	B	7.52	2,000	15,040
	C	8.18	2,700	22,085
Sub-Total & Average		7.90	4,700	37,126
1700N	-	-	-	-
1750N	-	-	-	-
1800N	A	10.08	4,700	47,376
TOTAL & AVERAGE	@ 10 cft	9.28	237,450	2,202,506
	@ 11 cft	9.28	215,864	2,003,218
Mined-Out Ore		7.29	6,414	46,758
Total @ 11 cft		9.34	209,450	1,956,460

Table 6
(Continued)

Possible Ore Reserves Of The Wolf No. 2 Vein

Tabulation By Section and Block
(10 cu.ft./ton; undiluted)

Cross Section No.	Block No.	Undiluted Reserves Grade Oz. Ag/Ton	Tons (Short)	Metal (Oz. Ag)
1100N	B	6.33	5,500	34,815
1150N	D	7.00	20,500	143,500
1200N	A	6.78	4,700	31,866
	C	10.49	29,300	307,357
Sub-Total & Average		9.98	34,000	339,223
1250N	F	14.17	6,000	85,020
1300N	E	10.95	4,700	51,465
1350N	D	11.69	4,700	54,943
1400N	A	7.15	4,400	31,460
	D	7.78	5,400	42,012
Sub-Total & Average		7.50	9,800	73,473
1450N	A	4.82	2,000	9,640
	E	6.53	3,200	20,896
Sub-Total & Average		5.87	5,200	30,536
1500N	A	7.19	1,750	12,583
1550N	-	-	-	-
1600N	-	-	-	-
1650N	A	11.33	1,300	14,729
1700N	A	8.20	6,500	53,300
1750N	A	12.17	5,800	70,586
1800N	-	-	-	-
TOTAL & AVERAGE	@ 10 cft	9.12	105,750	964,172
	@ 11 cft	9.12	96,136	876,760

Dilution has been assessed at 15%, taken equally from each wall and has been calculated at an average grade of 1.70 oz. Ag/ton over a total width of 1.68 ft. from the ring drilling on the 1220, 1325 and 1550 levels.

Accordingly, the Proven, Probable and Possible reserves of the Wolf #2 deposit are estimated at:-

Proven & Probable:	240,868 tons @ 8.34 oz. Ag/ton.
Possible:	110,556 tons @ 8.15 oz. Ag/ton.

6.3 SUMMARY OF ORE RESERVES

Table 7

Wolf Deposit
Summary of Ore Reserves

Section	Proven & Probable Ore Tons (short)	Proven & Probable Ore Oz. Ag/Ton	Possible Ore Tons (short)	Possible Ore Oz. Ag/Ton
NO. 1 VEIN				
1200N	16,900	15.27	-	-
1250N	24,700	16.15	-	-
1300N	23,650	10.14	-	-
1350N	14,400	11.16	-	-
1400N	3,800	6.41	-	-
Total @ 10 cft	83,450	12.97	-	-
Total @ 11 cft	75,864	12.97	-	-
Mined-Out Ore	1,164	12.50	-	-
Sub-Total	74,700	12.98	-	-
Dilution @ 15%	11,205	1.70	-	-
Total	85,905	11.52	-	-
NO. 2 VEIN				
1100N	7,900	6.33	5,500	6.33
1150N	25,600	6.37	20,500	7.00
1200N	32,200	6.78	34,000	9.98
1250N	47,500	12.55	6,000	14.17
1300N	27,900	12.21	4,700	10.95
1350N	18,100	11.27	4,700	11.69
1400N	18,300	7.53	9,800	7.50
1450N	17,900	7.06	5,200	5.87
1500N	15,000	8.00	1,750	7.19
1550N	6,450	9.51	-	-
1600N	11,200	8.94	-	-
1650N	4,700	7.90	1,300	11.33
1700N	-	-	6,500	8.20
1750N	-	-	5,800	12.17
1800N	4,700	10.08	-	-
Total @ 10 cft	237,450	9.28	105,750	9.12
Total @ 11 cft	215,864	9.28	96,136	9.12
Mined-Out Ore	6,414	7.29	-	-
Sub-Total	209,450	9.34	96,136	9.12
Dilution @ 15%	31,418	1.70	14,420	1.70
Total	240,868	8.34	110,556	8.15
NO. 3 VEIN				
Insufficient drilling and development to estimate ore reserves.				
TOTAL WOLF				
	284,150	10.30	96,136	9.12
Dilution @ 15%	42,623	1.70	14,420	1.70
	326,773	9.18	110,556	8.15

Table 8

DOLLY VARDEN MINERALS INC.

Summary of Proven, Probable and Possible Reserves,
Wolf Deposit
(11 cu. ft./ton)

	Grade (oz. Ag/ton)	Tons (short)
Wolf No. 1 Vein		
Proven	29,091	12.47
Mined-out	1,164	12.50
Total	27,927	12.47
Probable Total	46,773	13.28
TOTAL PROVEN & PROBABLE	74,700	12.98
Dilution @ 15%	11,205	1.70
Total	85,905	11.52
Wolf No. 2 Vein		
Proven	131,818	8.40
Mined-out	6,414	7.29
Total	125,404	8.46
Probable Total	84,046	10.66
TOTAL PROVEN & PROBABLE	209,450	9.34
Dilution @ 15%	31,418	1.70
Total	240,868	8.34
Possible	96,136	9.12
Dilution @ 15%	14,420	1.70
Total	110,556	8.15

6.4 ADDITIONAL ORE POTENTIAL

6.4.1 Wolf #2 Vein

A potential high-grade area has been indicated by three drill holes: WU22, WS83 and WS96, at about the 900 elevation, or 320 ft. below the lower level 1220 adit level. In our opinion this warrants additional development which could logically be done by driving a decline in ore below the 1220 adit level, followed by confirmatory percussion and diamond drilling.

6.4.2 Wolf #3 Vein

The 1220 adit level intersected the north part of the vein where it was low grade; however, additional development is warranted southwards along the strike of the vein to test the area of potential high-grade mineralization indicated by diamond drilling between sections 900N and 1000N, elevation 800 to 950 ft. A.S.L.

Respectfully submitted,

DERRY, MICHENER & BOOTH

I. S. Thompson, P.Eng.

W. N. Pearson, Ph.D.

Toronto, Ontario
February 15, 1981

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7.0 REFERENCES AND PARTIAL BIBLIOGRAPHY

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8.0 CERTIFICATES OF QUALIFICATION

I. S. Thompson, P.Eng.
W. N. Pearson, Ph.D.

CERTIFICATE OF QUALIFICATION

I, Ian Stuart Thompson, residing at 16 Edenbrook Hill, Islington, Ontario, do hereby certify that:-

(1) I am a consulting geologist and partner of the firm Derry, Michener & Booth.

(2) I am a graduate of the University of Toronto in Honours Geological Sciences with the degree of B.A. in 1959 and have been practising my profession since graduation.

(3) I am a registered Professional Engineer in the Province of Ontario and in the Province of British Columbia and am a Fellow of the Geological Association of Canada and of the Society of Economic Geologists.

(4) I have not received, nor do I expect to receive, any interests, directly or indirectly, in the stock of Dolly Varden Minerals Inc.

(5) The statements contained in this report and the conclusions reached are based upon my review of the data made available to me by Dolly Varden Minerals Inc. and by three examinations of the properties.

(6) I visited the property twice in connection with the supervision of a geochemical exploration programme undertaken by Derry, Michener & Booth on the Company's properties from July to September, 1978 and visited the Wolf Mine during the 1980 drilling programme carried out by Derry, Michener & Booth.

(7) I have co-authored all previous reports prepared by Derry, Michener & Booth concerning the Company's properties.

I. S. Thompson, P.Eng.

Toronto, Ontario
February 15, 1981

CERTIFICATE OF QUALIFICATION

I, William N. Pearson, of Suite 2302 - 401 Bay Street, Toronto, Ontario, do hereby certify that:-

(1) I am a geologist employed by the firm Derry, Michener & Booth.

(2) I am a graduate of the University of British Columbia in Honours Geology with the degree of B.Sc. in 1974, and of Queen's University, Kingston, Ontario, with the degree of M.Sc. in 1977 and Ph.D. in 1980.

(3) I have been practising my profession for six years.

(4) I have not received, nor do I expect to receive, any interest, directly or indirectly, in the stock of Dolly Varden Minerals Inc.

(5) The statements contained in this report and the conclusions reached are based upon my review of the data made available to me by Dolly Varden Minerals Inc.

(6) I personally supervised the drilling programme on the North Star Deposit during October and November 1980, undertaken by Derry, Michener & Booth.

W. N. Pearson, Ph.D.

Toronto, Ontario
February 15, 1981

APPENDIX A

ORE RESERVES OF NORTH STAR DEPOSIT

APPENDIX A

ORE RESERVES OF NORTH STAR DEPOSIT

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(Continued)

1.0 INTRODUCTION

Based upon the recommendations of Mr. R. W. Burton, P.Eng., former Mill Superintendent and General Manager of Torbrit Silver Mines, and Mr. L. W. Manning, Mining Consultant to DVM, the initial plan is to develop a high-grade central block of the North Star, above the 1025 level, situated approximately between 6500E and 6900E and 6100N and 6600N.

Although we have restricted our evaluation and estimation to the area in and around this high-grade block there exist other high-grade silver intersections, beyond these limits, which are possibly exploitable. They are also briefly discussed.

The chief economic metal of the Kitsault Valley deposits is silver. Lead and zinc values have not been considered in our reserve computation, as only a minor lead bonus could be expected from a potential silver-lead flotation concentrate and it is unlikely that the zinc content within the high-grade silver block has any value.

The reserve calculations were carried out initially by D. J. Archer, Ph.D., a mining geologist formerly with DMB, and latterly by W. N. Pearson, Ph.D., an economic geologist with DMB, in conjunction with, and under the direct supervision of, I. S. Thompson, P.Eng.

2.0 DRILLING AND DEVELOPMENT

2.1 PRIOR TO 1980

The North Star deposit has been outlined by a combination of surface diamond drilling, underground development and underground diamond drilling, carried out between 1956 and 1963. All the drilling was standard AXT.

Between July 1956 and October 1957, 20 surface diamond drill holes, numbered NS 1-20, were drilled by Torbrit Silver Mines Ltd., for a total of about 7,550 ft. of drilling.

Between 1958 and 1959, an adit was driven southwest at the 1025 level, starting at a bridge across the Kitsault River from the Torbrit workings. This adit was driven about 1,000 ft. southwest from the portal and was subsequently extended over 225 ft. to the south-southwest. At 1,000 ft., a cross-cut was driven 200 ft. to the southeast. In addition, a further 540 ft. of development was completed in four raises, drilling embayments and a short sub-drift, for a total of about 1,965 ft. of development.

From this underground development, Torbrit drilled 82 underground holes, at angles varying from -25^{o} to $+90^{o}$, for a total of about 12,200 ft. of underground drilling. These holes are numbered from 10-U-1 to 10-U-82, but for the remainder of this report the prefix 10 is omitted.

In 1963 Dolly Varden Mines Ltd. drilled an additional 10 underground holes, U-83 to U-92, totalling about 2,970 ft. of drilling, mainly from the southeastern end of the 1,000 cross-cut.

This work brought the total surface and underground exploration drilling on the North Star deposit to over 22,700 ft.

At the southeastern end of the deposit, and separate from the main high-grade block under consideration, three other adits at the 1660, 1560 and 1500 levels have also been developed.

From the 1500 level a short cross-cut was apparently driven to the west, but no further information on exploration in this area is known.

2.2 1980 DRILLING

During November 1980, 1,270 ft. of underground diamond drilling was completed at the North Star deposit. Five of these holes (U93-U97) were collared in the 1000 cross-cut (Section 1000W) and three holes (U98-U100) in the 1025 drift on section 840W. The drilling confirmed the dimensions and tenor of the ore on Section 1000W and indicated an additional tonnage in Section 840W (Hole U98).

2.3 PREPARATION OF PLANS AND SECTIONS

For this reserve calculation, a 1":20' scale master plan was drawn up originally in 1979 to cover the area of the proposed high-grade development; the northeastern boundary of this plan is about 580 ft. from the portal of the North Star Mine. On the plan, we have plotted the existing workings and the traces of both the surface and underground drill holes, projected onto the 1025 level. Holes drilled in 1980 have been plotted on Sections 840W and 1000W and incorporated with the pre-1980 data.

The collar coordinates and attitudes of holes U1 to U82 (Torbrit drilling) had been previously surveyed by Torbrit. Although only one certain dip test for hole NS 8 is recorded in the logs, it does not appear that the majority of the holes deviated more than nominally from the collar orientation and no corrections have been applied. Hole NS 18 was originally included in Section 840W; however, since two new holes were drilled in this area, this hole has been deleted from section.

In regard to the Dolly Varden drilling (holes U83 - U92), the collar coordinates do not appear to have been surveyed and the recorded coordinates are apparently in error by up to several feet. We have consequently plotted these holes at what appears to be their most reasonable position. In addition, several of the Dolly Varden holes, in particular U85, U86 and U88, are shallowly inclined, ($+15^{o}$ to $+30^{o}$) and are over 300 ft. in length; with no information from orientation tests the traces of the deeper portions of these holes are questionable.

The collar coordinates of the 1980 drill holes were surveyed by L. W. Manning, P.Eng.

3.0 DETERMINATIONS OF METAL CONTENT

Nearly 1,000 samples were taken from core recovered from drilling on the North Star deposit. Sample lengths relate to the geology and vary from 0.5 to 11 ft.; most of the samples are 5 ft. in length. Approximately 22% of the total footage drilled was sampled.

The Torbrit core was split on site and samples were fire assayed for silver at the mine site. Some samples were subsequently assayed for lead, zinc and copper.

The assay results from the drilling programme were provided to DMB on copies of the drill logs. Assays from the channel sampling were taken from the 1" to 20' scale plans of the 1025 level, prepared by Newmont Mining Corporation, who carried out an exploration programme on the property in 1967 (see references)

3.1 CHECK ANALYSES - 1974

No check assaying is known to have been carried out either by Torbrit Silver Mines or Dolly Varden Mines.

However, Mann (1974) discovered that about 330 diamond drill core sample pulps had been retained by Dolly Varden Mines and subsequently, 31 of these, distributed over a wide grade range, were re-assayed by Bondar-Clegg Laboratories of Vancouver. The two sets of assay results, together with a graph, as presented by Mann in his report, are included as Table A1 and Figure A1, respectively.

TABLE A1:

North Star Assay Check (from Mann, 1974)

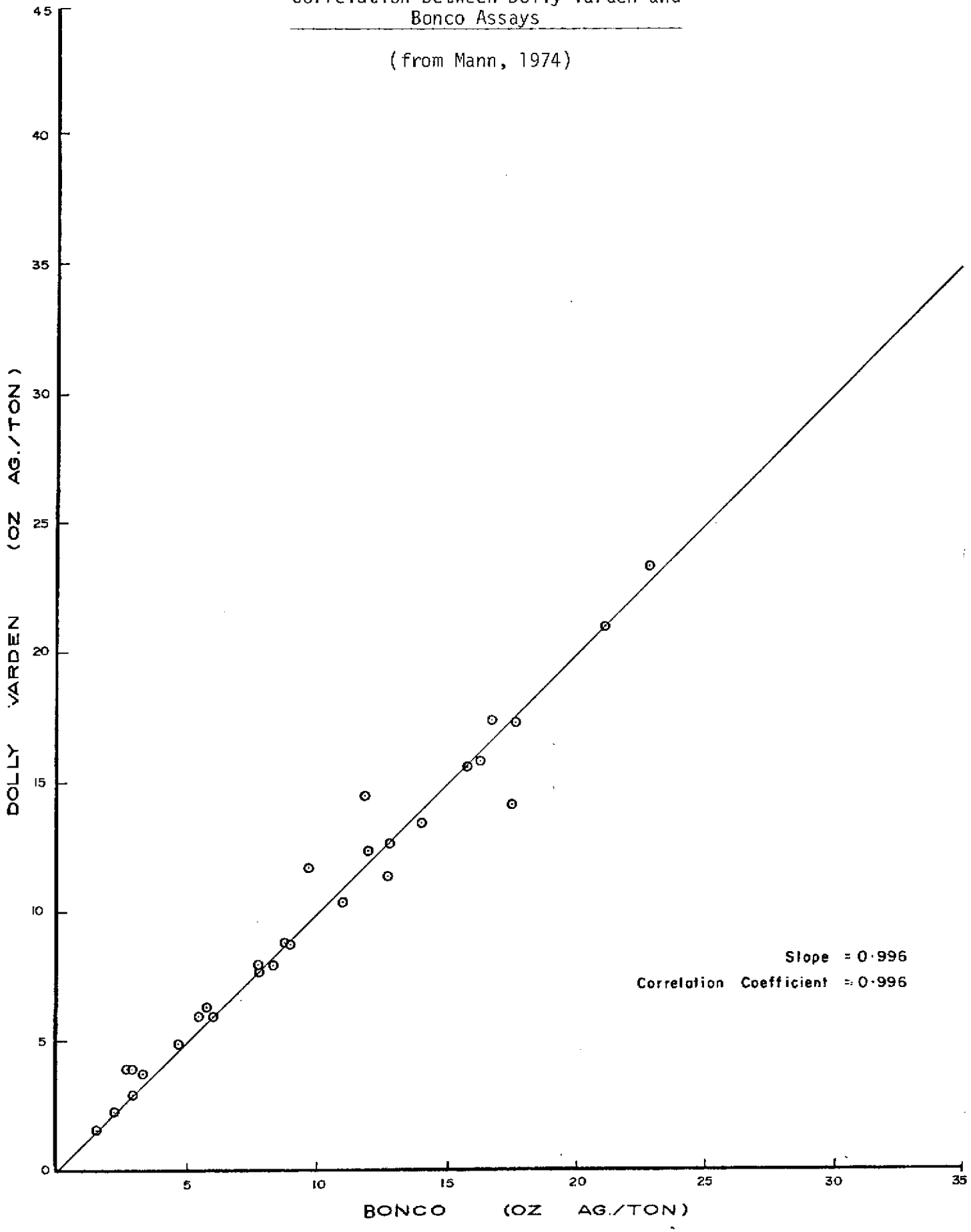
Samples chosen by D.S.E, E.L.M and M.A. Mitchell for check assay from 330 odd pulps available in Vancouver office (samples previously assayed for cu by Chemex Labs Ltd. June 15, 1971) Bondar-Clegg assays by telephone and unconfirmed due to delay caused by mail strike.

SAMPLE #	D.D.H.	Au		Pb			Zn			Cd	Geochem. 24-115
		D.V.	A34-Bonco	D.V. Compos.	D.V.	Bonco	D.V. Compos.	D.V.	Bonco	Bonco	Bonco
50227	NS 18	14.3	11.8		Tr			2.7			Hg= 19,800ppb
50225	NS 18	12.6	12.7		Tr			0.2			
56442	10-U-43	7.6	7.8	(0.57)			(2.92)				
63006	54	5.92	5.5	(2.2)			(4.2)				
63031	56	17.36	16.6	(2.0)			(3.9)				
63038	57	15.8	16.3	(0.5)			(1.7)				Hg= 4,160 ppb
63039	57	7.76	7.8	-			-				Sb= 6,400 ppb
63047	58	1.52	1.5	-			-				
63063	60	17.2	17.6	(0.40)			(2.3)				As=750 ppb
63074	61	66.00	65.3	(0.2)		2.00	(2.5)		1.65	0.01	Hg=49,280 ppb
3081	62	2.24	2.2	-			-				
63089	62	8.8	8.7	(0.7)		1.85	(1.9)		2.85	0.04	
63145	69	3.92	2.9	(0.9)			(1.3)				
63167	73	12.4	12.0	(1.4)			(1.5)				
63174	74	13.44	14.0	(0.4)			(0.5)				
63180	75	10.7	10.8	-			-				
63188	76	3.8	2.8	-			-				Hg=4,820 ppb
63192	77	10.3	11.0	(0.36)			(1.6)				
63196	78	14.1	17.5	-			-				
63200	78	11.66	9.6	(0.26)			(3.0)				
63207	79	4.84	4.8	-			-				
63208	79	23.08	22.7	-			-				
69816	44	11.4	12.6	(1.21)		2.00	(7.64)		8.30	0.10	Sb=114 ppb Hg= 41,360ppb
69827	45	15.6	15.7			3.20			7.60	0.13	
69832	45	7.96	8.3								
69839	42	20.96	21.1	(1.6)			(6.72)				Sb=131ppb Hg=46,200
69847	46	6.18	5.7	(2.15)			(5.16)				
69855	47	3.0	3.0	(0.32)			(1.85)				
69869	48	6.0	6.0	(3.53)			(6.0)				Hg=2,760 ppb
69884	49	8.76	8.9	-			-				
69913	50	3.64	3.2	-			-				

Figure A1

Correlation Between Dolly Varden and Bonco Assays

(from Mann, 1974)



For silver values, although a few individual results show some scatter, the overall correlation is excellent (0.996).

For lead and zinc values, the correlation is more erratic but, as Mann reports, no direct comparison is possible as the original Dolly Varden assays were composites.

3.2 CHECK ANALYSES - 1980

Core samples from the 1980 drilling were wet assayed by Min-En Laboratories using an aqua-regia digestion followed by Atomic Absorption (A.A.). Six pulps were sent to Bondar-Clegg to be checked by fire assay. Results are given in Table A2 and shown graphically in Figure A2. Although the two data sets have an excellent correlation coefficient of 0.998, the wet assay results are consistently about 10% higher than the corresponding fire assay values. According to Min-En Laboratories, wet assay results are typically 3-5% higher than those by fire assay, largely because of the smaller sample size and greater potential for analytical error in the wet assay method. The 10% difference here is significantly higher, suggesting that some Ag may have been volatilized during fire assaying, producing an artificially lower result.

As a consequence of the discrepancies in the check fire assaying weighted average grades for ore blocks defined by the 1980 drilling (U93-U100) have been reduced by 5% (actual wet chemical assays are shown without factoring on drill logs, plan and sections).

Table A2

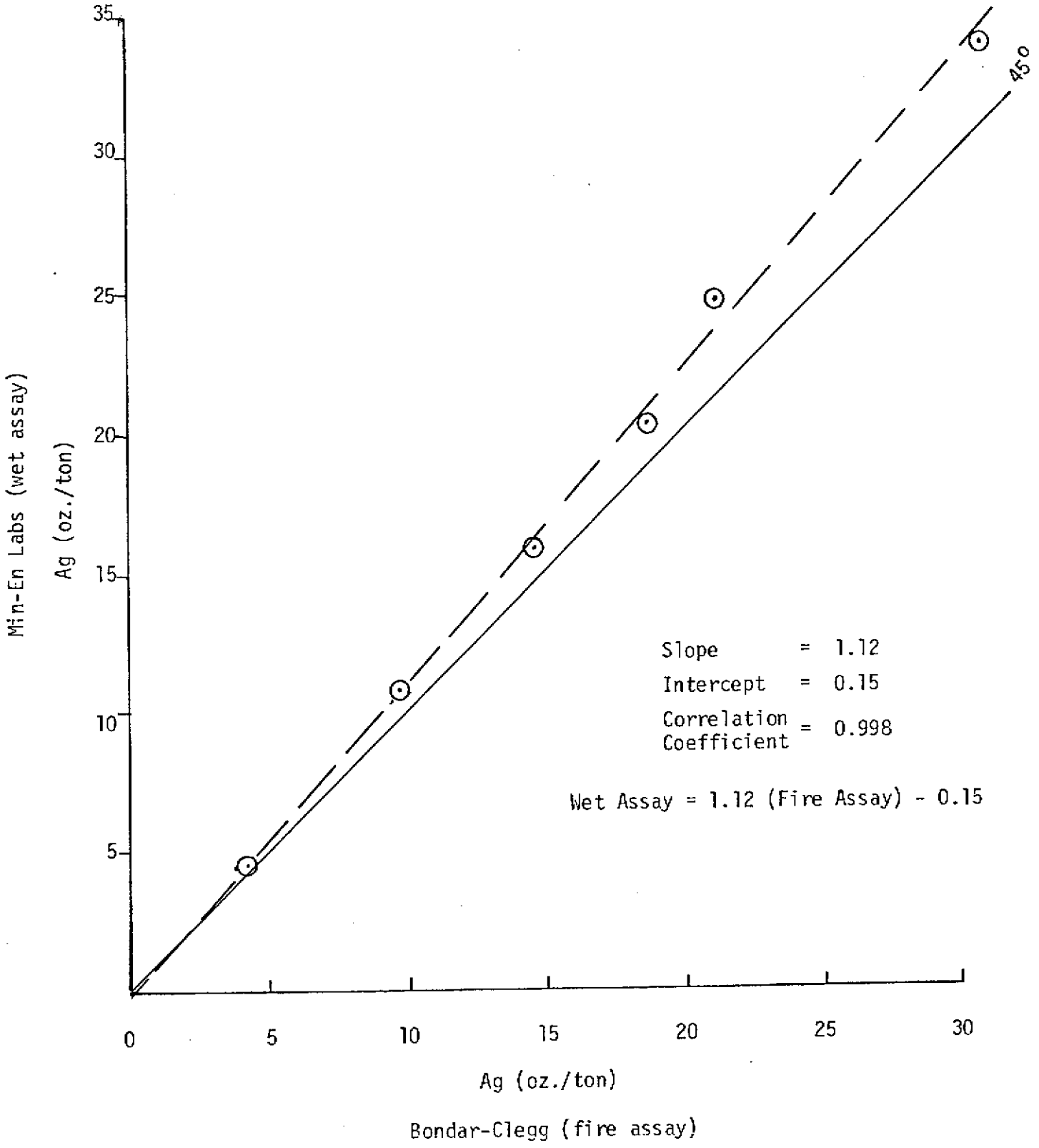
CHECK ASSAYS - 1980 DRILLING
NORTH STAR DEPOSIT

Sample #	Hole	Footage	Min-En Labs (Wet Assay) Ag oz./ton	Bondar-Clegg (Fire Assay) Ag oz./ton
9268	U93	115.3 - 118.5	20.25	18.55
9302	U94	108.1 - 112.4	15.80	14.52
9333	U95	108.7 - 111.0	24.80	21.20
9355	U96	161.3 - 164.3	4.51	4.18
9360	U96	174.6 - 177.9	10.80	9.83
9380	U97	145.3 - 149.3	33.95	30.80

Figure A2

CORRELATION BETWEEN WET ASSAY (MIN-EN) AND FIRE ASSAY (BONDAR-CLEGG) RESULTS

NORTH STAR DEPOSIT



3.3 CORE RECOVERY

Although sections of core loss are noted in the logs, overall core recovery is only recorded for some of the surface drilling, which varied from 94% to 99% and averaged 97%.

In general, core recovery appears to have been quite reasonable and no corrections were considered necessary to take account of core loss in the reserve calculations.

Core recovery during 1980 drilling is comparable to surface drilling, except for a few local sections, the recovery of which is noted in the drill logs.

4.0 CORRELATION OF GEOLOGY AND MINERALIZATION

The geological and mineralogical interpretations are based on correlation from hole to hole and section to section, through the high-grade portion of the deposit.

These correlations were carried out on a set of eight 1" to 20' scale cross sections through the high-grade portion of the deposit, copies of which are included in this report.

The spacing of the sections, as dictated by the underground drilling and development, varies from 50 ft. to 75 ft. The sections are numbered from 715W to 1150W, originating with section 1000W, which is approximately 1,000 ft. from the portal of the 1025 level. Although the sections actually face northeast, the west (W) designation in the section number is the orientation accepted by the operating personnel of DVM.

On each section, we have plotted the underground development, together with the traces of surface and underground drill holes; holes drilled at an angle to the sections have generally been projected to the nearest section. In the area of the high-grade block, we have plotted from the drill logs the geological information (short intersections of less than about 2 ft. have been omitted) and the high-grade intersections of greater than 4 oz. and 8 oz. of silver.

The detailed descriptions of the rocks and their complex alteration products are somewhat variable and we have adopted a simplified nomenclature in order to correlate the geological information from hole to hole. This nomenclature is shown in the legend on Section 1000W.

As we did not have the old drill core, we have relied extensively on the 1":20' plans and the 1":100 ft. sections compiled by Newmont Mining Corporation (1967). Modifications based on the 1980 drilling have been made, however.

The area of the North Star deposit is underlain by massive porphyritic lavas, agglomerates and tuffs of Formation B of the Hazelton Formation. These volcanic rocks are variably coloured from light to dark green, purple and grey. The colouration is often banded and/or mottled and generally appears to relate to alteration in the rocks. In the vicinity of the mineralization, the major alteration, however, is silicification and pyritization.

The major silver minerals are pyrargyrite, native silver and argentiferous galena. These are accompanied by pyrite, sphalerite, galena, chalcopyrite and marcasite.

For the most part, the relationships between mineralization and geology appear to be reasonably well defined and intersections are correlatable with acceptable assurance between pierce points up to 100 ft. apart.

The geometry of the mineralization appears relatively uncomplicated, with the high-grade forming a fairly uniform lens from 5 ft. to 32 ft.

thick, within the quartz-barite-calcite vein, which varies up to 70 ft. thick. The high-grade lens takes the shape of a flat-bottomed saucer, whose diameter is about 350 ft. and which dips to the northwest at about 45^{o}.

The boundaries of this high-grade are variably and incompletely defined. To the southeast, the mineralization terminates where the vein appears to either flatten or fold; however, it is possible that the vein could be disrupted by cross-faulting.

Towards the northeastern boundary, faulting has been recorded on the 1025 level, which appears to disrupt the mineralization. Although brecciation, shearing and intense fracturing, as noted in the logs, are plotted on our sections, the general attitude and the effects of such faulting remains uncertain. The faults do not appear to have a great throw, but it is possible that the continuity of the mineralization may not be as simple as it appears, which would be significant during mining.

To the northwest, the high-grade lens is interrupted by a lamprophyre dyke swarm. As the silver mineralization also appears to be weakening and fingering out in this direction, the grade and continuity of the high-grade in this area are not well assured, particularly as faulting is suspected along some of the dyke contacts. In the area of Section 775W the Newmont cross-sections indicate that the rocks may also be folded.

5.0 CALCULATION PROCEDURES

(Refer to cross sections showing "Reserve Blocks")

5.1 CRITERIA FOR INCLUSION OF INTERSECTIONS

The assumed undiluted economic cut-off grade for calculating the reserves of the North Star is 4 oz./ton Ag over a minimum thickness of 5 ft., measured perpendicular to the dip of the mineralization on cross section.

Contiguous assays from drilling and underground sampling, which meet the cut-off criteria, have been averaged together, weighted by core length, and these intersections have been plotted on section. Geological judgement was exercised to include marginal assays, in order to obtain a more uniform thickness for mining.

Intersections of less than 5 ft. thickness were extended to 5 ft. by incorporating a sufficient portion of either the hanging wall or footwall assay, whichever was the higher in grade. Where neither the hanging wall nor the footwall had been assayed, the extension was carried out at zero grade. These extended intersections were then available for incorporation into the reserves if they still equaled or exceeded the cut-off criteria.

Sub-grade intersections within an ore zone were generally separated out as internal waste if they exceeded 5 ft. in thickness, on the assumption that it would be possible to separate this material from ore during mining. However, on hole U-61, section 1000W, two intersections

8 ft. apart have been merged together, as the potential internal waste block would be isolated and difficult to separate. Intersections falling within the cut-off criteria were included in the reserves if correlation on and between sections indicated that the continuity of the zone appeared reasonably well established. Fifteen intersections omitted from the reserves are listed in Table A3, together with comments on possible exploitation. Additional exploration will be required to confirm the continuity of the mineralization between these intersections.

5.2 RESERVE BLOCKS

Reserves were calculated on cross section by locating reserve blocks around each mineralized intersection, including the 1980 drill intersections, and projected onto the nearest section. Special procedures were adopted for incorporating intersections located some distance off section. For example, intersections on holes U-73 and U-74, located about 20 ft. to the northeast and northwest of section 1075W, respectively, were combined into a single intersection, U-73 - 74. Intersections on hole U-62, between sections 950W and 890W and holes U-77, U95 and U97, between sections 1000W and 1075W, were separated out from blocks on section (refer to plan showing "Reserve Blocks"). Similarly U-93 lies between sections 1000W and 950W.

Table A3

DOLLY VARDEN RESOURCES LTD.

High Grade Reserves Of The North Star Deposit

High Grade Intersections Not Incorporated In The Reserves

Cross Section	Intersection No. U = Upper L = Lower	Unadjusted Grade Oz. Ag/ton	Core Length Ft.	Comments
600-650W	-	-	-	Wright Engineers estimated 14,400 tons grading 9.33 oz. Ag/ton and Dolly Varden Mines 19,300 tons grading 9.64 oz. Ag/ton including ore below the 1025 level track. This ore is probaby accessible from the 1025 level.
775W	U21	17.24	5.0	Interrupted by dykes, but may correlate with U19U (below) and be accessible by subdrifting.
	U88	22.40	5.0	Position of hole U88 is in doubt and additional drilling is required to substantiate the correlation between U88 and Raise No.3.
840W	U19U	14.70	5.0	Both intersections are interrupted by the dyke swarm and lack continuity. U19U may correlate with U21 (above).
	U19L	9.40	5.5	
	NS18U	14.30	5.0	Position of hole NS18 is in doubt, and grade of intersections conflict with those in hole U47.
	NS18L	11.32	10.0	
	U100L	7.63	5.7	A relatively low grade intersection that is separated from the upper block by a section grading 2.65 oz. Ag/ton over 8.0'.
950W	U42U	15.78	10.0	Both intersections are interrupted by a dyke; additional accessible reserves may exist to the northwest of the dyke.
	U42L	13.48	4.5	
	U78L	14.10	5.0	Isolated lens which may be accessible from main workings.
	NS5	34.32	6.0	May form a continuous block with NS2 (see below). May be accessible from the 1660 level.

(cont'd. 2/)

Table A3

(Continued)

Cross Section	Intersection No. U = Upper L = Lower	Unadjusted Grade Oz. Ag/ton	Core Length Ft.	Comments
1000W	U53	13.20	7.0	Both intersections lack continuity and are interrupted by the dyke swarm.
	U14	9.40	6.5	
1075W	U17	11.16	5.0	Lacks continuity and is interrupted by a dyke.
	NS2	8.56	7.2	A relatively low grade intersection which is separated from the main mining block. May form a continuous block with the intersection on NS5, but additional drilling would be required to establish continuity.

Reserve blocks are numbered from the drill hole or development on which they are centered (e.g. U-20 and R-3 refer to blocks centered on underground hole U-20 and Raise #3, respectively). Suffixes U and L designate upper and lower blocks on the same hole or development (e.g. U43U, U42U, U100U, U43L. In the case of the U62 block located between Sections 890W and 950W, the block has been separated into east and west (E and W) parts for incorporation into the tabulation of reserves by cross section (Table 3, p. 5-4).

5.3 RESERVE CALCULATIONS

Reserves were calculated on working tabulation sheets, the original copies of which are available on file in DMB's offices.

The overall grade and thickness of each block is that of the intersections on which the block is centered, as described above. Grades of blocks range from 6.71 to 32.56 oz. per ton silver. Five high-grade samples, 152.5 (U99), 97.5 (U95), 62.5 (U95, 66.0 (U61), and 53.6 (U61), exceed the 50 oz./ton cut-off limit established from Torbrit mining practise. Only one of these, 152.5 oz. cut in hole U-99-80, on Section 840W, was cut to 50 oz. since it was enveloped by significantly lower grade ore. The others occur within much higher grade ore blocks and cutting was felt to be an unnecessary penalty.

Block thicknesses range from 5 ft. to 32 ft.

The width of each block was measured by projecting blocks halfway to intersections in the adjacent holes on section. At the margins of the ore, blocks were projected halfway to the next subgrade intersection, except where either excessive drill hole spacing or geological correlation suggested that a block should be limited. For example, on section 950W, the next (sub-grade) intersection from U-75 is about 200 ft. up-dip and the width of the block centered on U-75 has been based on correlation with ore grade intersections on the adjacent cross sections. On section 950W, block U-42U and U-42L are terminated by dykes, while on section 840W blocks U-46 and U-100 are curtailed by a possible fault.

The widths of blocks, measured in the plane of the sections, vary from 11.0 ft. to 115 ft.

Block lengths were calculated by projecting blocks halfway to the next section. Again, a block length was occasionally restricted, e.g. on Section 775W, blocks R3U and U-20 are curtailed as a result of lack of continuity to the zone in this area. Block lengths range from 18.5 ft. to 62.5 ft.

5.4 TONNAGE FACTOR

In previous reports and internal memoranda, various tonnage factors ranging from 10 to 11 cu.ft. per ton have been suggested for the North Star deposit. Messrs. Manning and Burton have suggested that the tonnage factor is likely to approximate about 10.5 cu.ft. per ton.

However, for this reserve calculation, a conservative factor of 11 cu.ft. per ton has been used to convert volumes to short tons, for both ore and waste material. The proportion of barite in the gangue has the most direct effect on ore density; however, the barite content is variable and is not well documented in the drill logs.

5.5 MINED-OUT ORE

Three blocks on two sections, R3L and R3U on 775W and R4 on 890W, were partially mined out during the exploration and development of the 1025 level; consequently, the reserves have been adjusted to take this feature in account.

6.0 DILUTION

Assumed dilution for this reserve calculation is based on advice by Mr. L. J. Manning.

For undiluted ore thicknesses of less than 10 ft. it has been assumed that the dilution for the hanging wall and the footwall will each be 1 ft. and 6" in thickness, respectively.

For undiluted ore thicknesses of 10 ft. or greater, it has been assumed that the hanging wall and footwall dilution will be, respectively, 2 ft. and 1 ft. in thickness.

The tonnage of the diluted reserves was calculated, along with the undiluted reserves, on the working calculation sheets.

The average grade of dilution has been calculated separately for each cross section, as the arithmetic average of the mean hanging wall assays and the mean footwall assays, using those intersections incorporated into the reserves.

As a result of the 1980 drilling it is apparent that the hanging wall of some parts of the high-grade ore zone consist of broken and faulted rock. Although we have allowed for 2 ft. of dilution it is possible that overbreak and some caving may still occur in this region.

The drill hole intersections in the suspect area are listed in Table A4, together with notes on the geology in the hanging wall. In many cases, the hanging wall consists of subgrade vein material and it may be possible to control dilution during mining by exercising close grade control and underdrilling the high-grade mineralization.

Table A4

DOLLY VARDEN MINERALS INC.

ORE RESERVES OF THE NORTH STAR DEPOSIT

INTERSECTIONS IN THE HIGH-GRADE AREA
WHICH ARE OVERLAIN BY FAULTED MATERIAL

(Note: All thicknesses in plane of section)

Cross Section	Block Number	Geology in the Hanging Wall of Intersection
775W	None	-
840W	U98	2.5 ft. of sheared quartz breccia grading into 9.8 ft. of strongly foliated siliceous blastomylonite.
	U99	3.2 ft. of strongly altered (clays) fault breccia.
	U100	0.9 ft. of silicified mylonitic breccia followed by 4.3 ft. of vein.
890W	U43U	8 ft. of silicified and altered volcanics; then (?) minor fault.
	U45	4 ft. of vein, with fragments of country rock; then soft broken core.
950W	U62U	5 ft. of vein; then soft altered volcanics.
	U78	3 ft. of ground core in 4 ft. section of volcanic breccia.
	U75	8 ft. of vein, including about 2 ft. of lost core.
1000W	U44	4 ft. of vein, then fractured volcanics.
	U60	1 ft. with evidence of faulting.
	U79	4 ft. of vein; with 4 inches of gouge approximately 6 ft. above the hanging wall.
	U61	silicified and pyritized volcanics.
	U69	5.5 ft. of volcanic breccia; then broken core and fault.

Table A4
(Continued)

Cross Section	Block Number	Geology in the Hanging Wall of Intersection
1000W	U93*	2.5 ft. of vein then 3.7 ft. wide chlorite-rich zone.
	U94	5.4 ft. of vein then 3.5 ft. of strongly sheared and chloritized volcanic rock (tuff?).
	U95*	4.3 ft. of vein then 2.1 ft. of siliceous blastomylonite which grades into 2.8 ft. of chloritized fault breccia.
	U96	5.6 ft. of siliceous blastomylonite then 2.5 ft. of chloritized breccia.
	U97*	3.6 ft. of siliceous, friable mylonite then 5.3 ft. of chloritized fault breccia.
1075W	U74	2 ft. of broken core.
1150W	None	-

* Ore intersections in Holes U95 and U97 are between sections 1000W and 1075W. Hole U93 plots between sections 950W and 1000W. Hanging wall intersections have been projected into the plane of section to correct thicknesses.

6.1 PREPARATION OF BULK SAMPLE FOR ORE DRESSING

On the instruction of Wright Engineers Limited we selected assay sample rejects of the ore grade intervals from the 5 holes drilled on section 1000W in 1980. Proportions of hanging and footwall assay rejects were added on a weight basis to represent 2 ft. and 1 ft. of dilution from hanging wall and footwall, respectively. The resultant composite sample and its head grade should therefore be reasonably representative of stope muck grade. The weighted average grade of the samples composited above is 13.94 oz. Ag/ton.

7.0 CALCULATION OF RECOVERABLE RESERVES

Based on preliminary drawings by Mr. L. J. Manning in 1979 on the proposed development of the North Star deposit, DMB originally calculated that approximately 14% of the area of the high-grade block would be retained as pillars during mining. On the advice of Mr. Manning, we had assumed that 50% of these pillars would ultimately be recovered, for an overall recovery of 93% of the diluted reserves.

Since the preparation of Mr. Manning's original mining plans there have been numerous alternative refinements and/or modifications. In our opinion, an estimation of recoverable reserves is more properly the function of Wright Engineers and we have accordingly made no provision for mining recovery in this report.

B. & C. LTD.

APPENDIX B

ORE RESERVES OF THE WOLF DEPOSIT

APPENDIX B

ORE RESERVES OF THE WOLF DEPOSIT

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(Continued)

1.0 INTRODUCTION

Dolly Varden Minerals Inc. (DVM) plans to exploit the drill-indicated and partially developed reserves of the Wolf #1 and #2 veins by conventional trackless mining techniques. Substantial development and drilling would be required to prove up reserves on the #3 vein.

In our 1979/80 report to DVM we did not carry out an independent assessment of the deposits but relied upon previous ore reserve estimates by M. A. Mitchell (1972) for Dolly Varden which had been reviewed by D. Wortman, P.Eng., of Wright Engineers (1977). In addition, we examined earlier reports by Dr. G. Skerl (1961 and 1964) and Chapman, Wood and Griswold (CWG)(1969).

For this estimation we have relied chiefly on factual data plotted by Mitchell on a series of cross-sections and level plans, together with a review of all available surface and underground diamond drill logs and results of the detailed ring percussion drilling programme carried out by Dolly Varden on the various adit levels.

The chief economic metal of the Wolf deposit is silver. Lead and zinc values have not been considered in our reserve computation as only a minor bonus could be expected from a potential silver-lead concentrate and is unlikely that the zinc content within the orebody has any value. The DMB reserve calculations were carried out by W. N. Pearson, Ph.D., an economic geologist with DMB, in conjunction with, and under the direct supervision of I. S. Thompson, P.Eng.

Our review is partially based upon a limited programme of test core drilling on three percussion drilling rings on the 1220 level of the Wolf #2 deposit. This was completed late in 1980 under the field supervision of Mr. E. J. Horney, a mining geologist with DMB. Mr. Horney also remapped part of this level. I. S. Thompson examined the drill core and accessible portions of the 1220 adit level during this programme.

2.0 GEOLOGY AND MINERALIZATION

The area of the Wolf deposit is underlain by massive andesitic-dacitic(?) lavas and pyroclastic breccias of the Hazelton Group of Lower Jurassic age. These volcanic rocks are vari-coloured, from green, purple to gray. In the vicinity of the veins these rocks are strongly silicified.

The Wolf deposit comprises three sub-parallel veins striking N15°E and N30°E and dipping steeply (70° to vertical west). These veins, which vary in width from 20 ft. to 52 ft., are considered by Skerl (1964) to be segments of a single vein that has been offset by two faults striking due east and dipping 45°S and a third fault striking northwest and dipping 60°N.

A low-grade section of the Wolf #3 vein was intersected in the 1220 adit level but the better grade sections have been intersected in only four drill holes and thus the #3 vein has been excluded from our current ore reserve.

Major silver minerals are pyrargyrite and native silver which are accompanied by pyrite/marcasite and minor sphalerite and galena. Pyrite/marcasite locally comprise up to 65% in tension fractures, vein fillings and surrounding breccia fragments. Crustiform and colliform vein textures are common with jasper locally abundant.

The footwall and hanging walls of the vein are strongly jointed with both horizontal and vertical movement indicated by slickensiding; these joints are typically carbonate/quartz filled.

In contrast to the North Star deposit, the geometry of the mineralization in the Wolf deposit is irregular. High-grade zones in the Wolf #2 vein can generally be correlated from ring to ring; however, the boundaries are highly variable and internal waste is frequent. As a consequence a strict cut-off grade cannot be applied to these deposits.

Mitchell (1969) shows the southern limit of the ore zone in the #2 vein to be interrupted by a lamprophyre dyke swarm. Although small intersections of lamprophyre dykes are commonly noted in the drill logs, it is uncertain whether this feature dictates the southern mining limit as considered by Wright Engineers (1977).

3.0 SAMPLING, DRILLING AND DEVELOPMENT

3.1 PRIOR TO 1980

The most complete review of the previous exploration carried out is Skerl (1964). Since a detailed examination of surface showings and trenches was beyond the scope of our work in 1980, we have relied upon his description of the Wolf deposits and have included direct quotations from his report wherever applicable.

Work on the Wolf veins, chiefly prospecting and trenching, was carried out in the early years of the century and in 1917 a number of holes were drilled to test the Wolf #1 and #2 veins at shallow depths. Nothing further was done until 1960 when further limited diamond drilling was carried out by Dolly Varden to test some of the older work. Extensive diamond drilling was carried out in 1962 which resulted in the decision to develop the Wolf #1 and #2 veins in 1963. This development comprised 900 ft. of drifting and 12,500 ft. of underground ring percussion drilling. An adit was driven at the 1450 level to gain access to the Wolf #1 vein for drilling. A raise was driven in ore from this level followed by sub-drifting on the #1 vein on the 1550 level. Three adits at the 1220 level, 1325 level and 1550 levels were driven on the Wolf #2 vein; in addition, a cross-cut was driven to connect the #1 and #2 veins and the 1220 level adit on the #2 vein was extended westward through the bounding fault and intersected a low-grade part of the #3 vein segment. Following this, underground holes U-1 to U-23 were drilled to test the downward continuity of all Wolf veins.

In 1969, Chapman, Wood, and Griswold (CWG) carried out extensive channel sampling and horizontal ring percussion holes on the 1220 level of the Wolf #2 vein for Bralorne Mines. A detailed comparison was made of grades between this channel sampling and earlier Dolly Varden percussion drilling data. This is described in Section 3.1.

Following this, and up to 1973, M. A. Mitchell, Dolly Varden's geologist, prepared a series of level plans and cross-sections at 50 ft. intervals, as well as a vertical longitudinal section, and estimated the ore reserves. No further work was carried out on the Wolf deposits until 1980.

3.2 1980 DRILLING

During the fall of 1980, 17 diamond drill holes totalling 887 ft. were drilled on rings 17, 21 and 23 in the 1220 level drift, Wolf #2 vein. The purpose of this programme was to check the accuracy of the Dolly Varden percussion drilling (1969) on which Mitchell based his estimation of proven and probable ore reserves.

3.3 COMPARISON OF PERCUSSION AND CORE DRILLING

Table B1 shows weighted (by core length) averages for each core drill and percussion hole in rings 17, 21 and 23. Cross sections of each ring showing detailed assay results are in the map pocket. Although there is considerable variation between individual percussion and diamond drill holes, the overall weighted average is very close. This indicates that the percussion ring drilling results are representative of the overall average grades.

Chapman, Wood and Griswold (1969) reported a correlation of Dolly Varden versus CWG percussion hole sampling and assaying. The Dolly Varden results are those employed by Mitchell, Wright Engineers and subsequently by DMB in the ore reserve calculations for the Wolf deposit. Table B2 shows the reported values. The correlation between individual assays from respective holes is generally poor; however, if the entire data set is considered, the correlation (0.82) is reasonable. The mean and standard deviation of the old set is 3.43 and 4.52, respectively, and for the present set 3.79 and 4.28. A t-test indicates that there is no significant difference between these two data sets at the 99.5% confidence level.

Results of comparative diamond and percussion drilling emphasize the need for a large number of drill samples in order to minimize overall statistical variation.

Table B1

Comparison of Percussion and Diamond Drilling Results

Rings 17, 21 and 23 - Wolf #2 Deposit

	Percussion (Dolly Varden)	Diamond Drill - 1980
Ring 17		
#1	8.87/32.8'	12.86/32.8'
#3	4.72/38.0'	4.99/38.0'
#4	6.03/26.0'	3.68/26.0'
#6	37.47/50.2'	37.82/50.2'
Avg.	17.06 (100)	17.73 (104)
Ring 21		
#1	14.30/28.0'	21.17/28.0'
#2	10.80/14.0'	13.72/14.0'
#3	10.13/35.7'	4.22/35.7'
#4	3.41/20.60'	2.57/20.60'
#5	4.07/7.2'	14.26/7.2'
#6	10.07/18.6'	8.49/18.6'
Avg.	9.67 (100)	Avg. 10.06 (104)
Ring 23		
#1	14.66/26.0'	24.17/26.0'
#2	32.09/12.2'	21.32/12.2'
#3	14.84/31.8'	10.78/31.8'
#4	3.83/13.5'	7.99/13.5'
#5	0.90/4.1'	0.57/4.1'
#6	8.33/10.1'	4.24/10.1'
Avg.	14.17 (100)	14.17 (100)

Weighted by core length (uncut)

Table B2

Correlation of Dolly Varden Versus
C.W.G. Percussion Hole Sampling and Assaying

(from Chapman, Wood & Griswold, 1969)

Horizontal Holes Only

4 Foot Assay Intervals

	Footage	D.V.	C.W.G.
Ring 7-W	4	.5	.28
	8	.5	.3
	12	.2	.12
	16	trace	.05
	20	.9	3.86
	24	.9	2.68
	28	.3	2.64
	32	.5	3.68
	36	3.1	5.1
	40	6.2	10.6
Ring 7-E	4	5.1	4.72
	8	3.7	5.2
	12	1.9	2.0
	16	1.9	1.4
	20	2.4	1.24
	24	2.3	2.56
Ring 13-W	4	.1	.88
	8	.3	1.12
	12	18.0	11.56
	16	5.2	7.68
	20	3.6	7.36
	24	11.7	2.24
Ring 13-E	4	2.8	2.08
	8	4.0	1.12
	12	2.4	4.1
	16	2.0	6.76
	20	2.4	1.52
	24	.3	.8
	28	.6	1.92
	32	.4	.24
	36	.1	2.4
	40	trace	2.12
Ring 19-E	4	2.9	2.76
	8	16.2	11.48
	12	9.0	1.52
	16	2.8	2.82
	20	.8	0.9
Ring 19-W	4	6.0	5.32
	8	8.1	10.00
	12	2.1	2.6
	16	1.0	1.56
	20	.3	1.24
	24	1.3	1.36
	28	.4	1.02
Ring 21-E	4	17.5	20.68
	8	15.3	17.92
	12	4.4	7.68
	16	1.2	1.58
	20	1.1	1.08
Ring 21-W	4	3.8	2.64
	8	4.4	6.84
	12	1.9	.88
	16	.4	2.12
	20	.1	.52

Correlation Coefficient = 0.82

Old

$\bar{X}$ = 3.43
S = 4.52
N = 54

Present

$\bar{X}$ = 3.79
S = 4.28

3.4 PREPARATION OF PLANS AND SECTIONS

Drill hole and average ore intercept assay data for the Wolf #1 and #2 veins have been plotted by Skerl on a vertical longitudinal section striking N26^{O}E and showing the equivalent horizontal widths for each drill hole or intersection, average of grades from ring drilling, trenches and back samples. Scale is 1" = 40'. This format was followed by Mitchell from 1969 to 1973 and has been used as a basis for our current estimation of reserves.

We have used the same series of 1" = 40' scale level plans and cross sections (at 50 ft. intervals, from 1100N to 1800N, along the strike of the vein) which were originally prepared by Mitchell in 1969. Data from ring percussion drilling and surface diamond drilling have been projected onto each section. Several of these cross sections were replotted to check for accuracy, which was found to be good. The longitudinal section prepared by Mitchell, however, was completely redrawn because it contained several projection errors; in particular, the fault separating the #2 and #3 veins was incorrectly plotted in the #3 vein segment of the drawing.

4.0 DETERMINATIONS OF METAL CONTENT

The sample procedures and techniques employed at the Wolf Mine are summarized by CWG as follows:-

"Long Hole Drilling

(a) Equipment: Gardner Denver SFH D-123 long-hole drill. Air-Trac and/or column mounted where applicable. One inch drill rods, two inch bits, sludge collection via plastic casing and sludge "tee's" where possible. Eight inch bottom section of forty-five gallon drum for sludge collection. Plastic sample bags. Water at 90 P.S.I. for cutting removal.

(b) Rings at twenty foot intervals drilled normal to the strike of the mineralization, six holes per ring where possible and applicable. Two holes at minus 60^{0}, two holes flat and two holes at plus 60^{0}. Holes numbered one through six starting at lower-left hole on section looking $N25^{0}E$ and continuing clockwise.

(c) Sampling: Four foot intervals, cleaning hole with air and water after each interval until clean water runs from hole. Sludge allowed to settle in collecting pans until water is murky-clear (i.e. only rock flour in suspension). Total sludge placed in plastic bag and identified by marking on bag with a marking pencil. Samples delivered to assay office."

Chip-channel back samples were taken between percussion hole collars by Dolly Varden at variable widths depending on geology. Surface diamond drill holes were sampled at variable intervals with the extent of sampling apparently dependent on the presiding geologist. Some holes have been extensively sampled and assayed whereas in others the assay interval was strictly confined to perceived high-grade parts of the vein. According to CWG, all sampling and drilling was referred to surveyed points.

All samples were fire assayed by Dolly Varden at their own assay office at the Torbrit mine site. A comparison of Dolly Varden assays and Coast Eldridge on duplicate pulps, as given by CWG, is shown in Table B3. The correlation coefficient between these two data sets is 0.9976; hence, as noted by CWG, there is no significant statistical difference.

The majority of the split core samples provided during the 1980 drilling programme at the Wolf deposit were wet assayed by Min-En Labs. Ten check assays of pulps of these samples were done by fire assay at Bondar-Clegg. Results of these check assays are shown in Table B4, and graphically in Figure B-1.

Excluding sample #9218, for which analytical error or very poor representivity is probable, the two data sets define a best fit line having essentially a perfect correlation. The wet assay results are consistently about 5% higher than the fire assay values. In the range of silver values throughout most of the deposit, however, this difference is not significant and hence these wet assay results have not been cut.

Table B3

Correlation of Dolly Varden Assays and Coast Eldridge Assays
(from Chapman, Wood & Griswold, 1969)

DV	CE	DV	CE
9.14	8.8	38.00	37.8
35.76	34.4	11.48	11.1
19.92	18.8	22.18	22.0
6.58	6.3	4.60	5.2
4.74	4.7	47.80	46.3
10.80	10.6	4.34	4.1
8.90	7.8	32.64	33.3
18.82	19.2	26.74	25.3
5.02	4.6	38.56	35.9
14.82	130.5	5.04	9.0
15.88	17.0	4.86	5.4
26.48	25.2	37.98	38.7
10.32	10.3	trace	1.6
12.60	12.4	7.98	9.0
38.66	42.4	3.06	3.6
7.28	7.3	.90	.80
5.94	5.8	.80	.72
10.00	9.9	.20	.16
17.00	17.0	5.30	5.5
8.00	7.8	4.46	4.9
52.16	50.8	3.10	3.4
5.80	5.8	39.60	40.4
6.36	6.1	15.26	15.8
29.40	28.8	200.00	200.9
8.62	8.7	1.90	3.0
5.58	5.3	1.90	3.7
		.80	1.4

Correlation co-efficient = 0.9976

Table B4

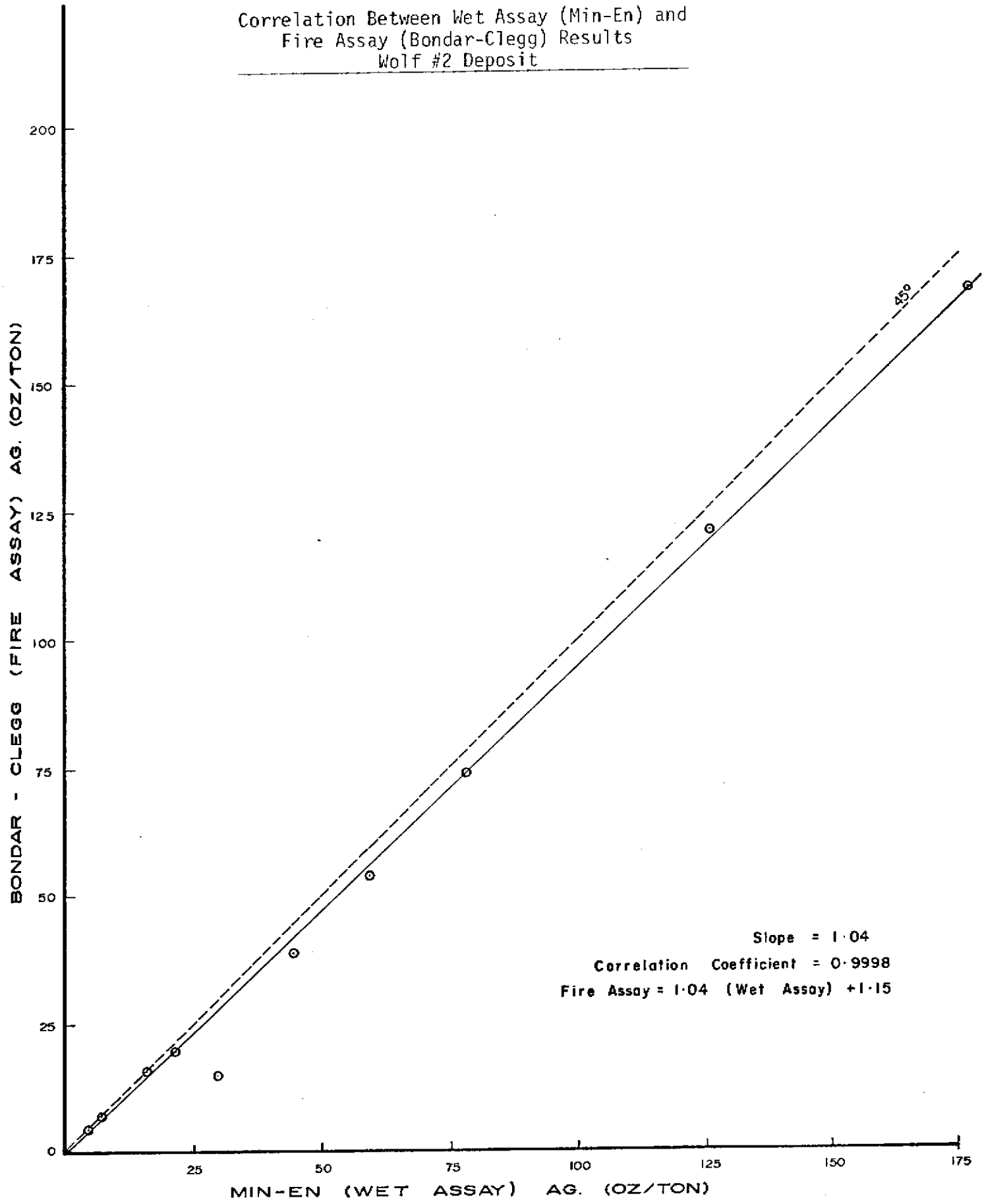
Check Assaying - 1980 Drilling

1220 Level, Wolf #2 Vein

SAMPLE NO.	HOLE	SILVER (oz./ton)	
		Bondar-Clegg (fire assay)	Min-En (wet assay)
9102	WU36	4.13	4.35
9115	WU36-1	6.95	7.55
9133	WU36-1	39.20	43.50
9134	WU36-1	15.25	16.10
9135	WU36-1	19.00	21.60
9169	WU-27	53.80	59.40
9183	WU-37	74.10	78.80
9184	WU-37	120.90	126.00
9185	WU-37	168.40	177.00
9218	WU-39	15.15	30.10

Figure B1

Correlation Between Wet Assay (Min-En) and
Fire Assay (Bondar-Clegg) Results
Wolf #2 Deposit



4.1 ASSAY VARIABILITY IN ADJACENT DRILL HOLES, WOLF #2 DEPOSIT

Diamond drill hole WU-36 was redrilled 6" away as WU-36-1 after the original hole was lost due to welding the bit to the face. Figure B-2 shows assays for both holes. The weighted average over the ore width of 20.6 ft. is 2.95 oz. Ag/ton in WU-36 as compared to 2.57 oz. Ag/ton in WU-36-1. Over the total length of WU-36 the weighted average is 2.66 oz. Ag/ton. The corresponding average in WU-36-1 is very close, i.e. 2.67 oz. Ag/ton. Results from these two holes emphasize the fact that a larger number of samples minimizes overall statistical variation. For this reason, inclined holes through the deposit are more likely to be representative of overall grade than flat holes.

4.2 CORE RECOVERY

All of the ring drilling, except for the 1980 drilling, were percussion holes. Core recovery for surface diamond drilling is only recorded for hole WS-85 (96.6%). Small sections of lost core are, however, noted in the logs.

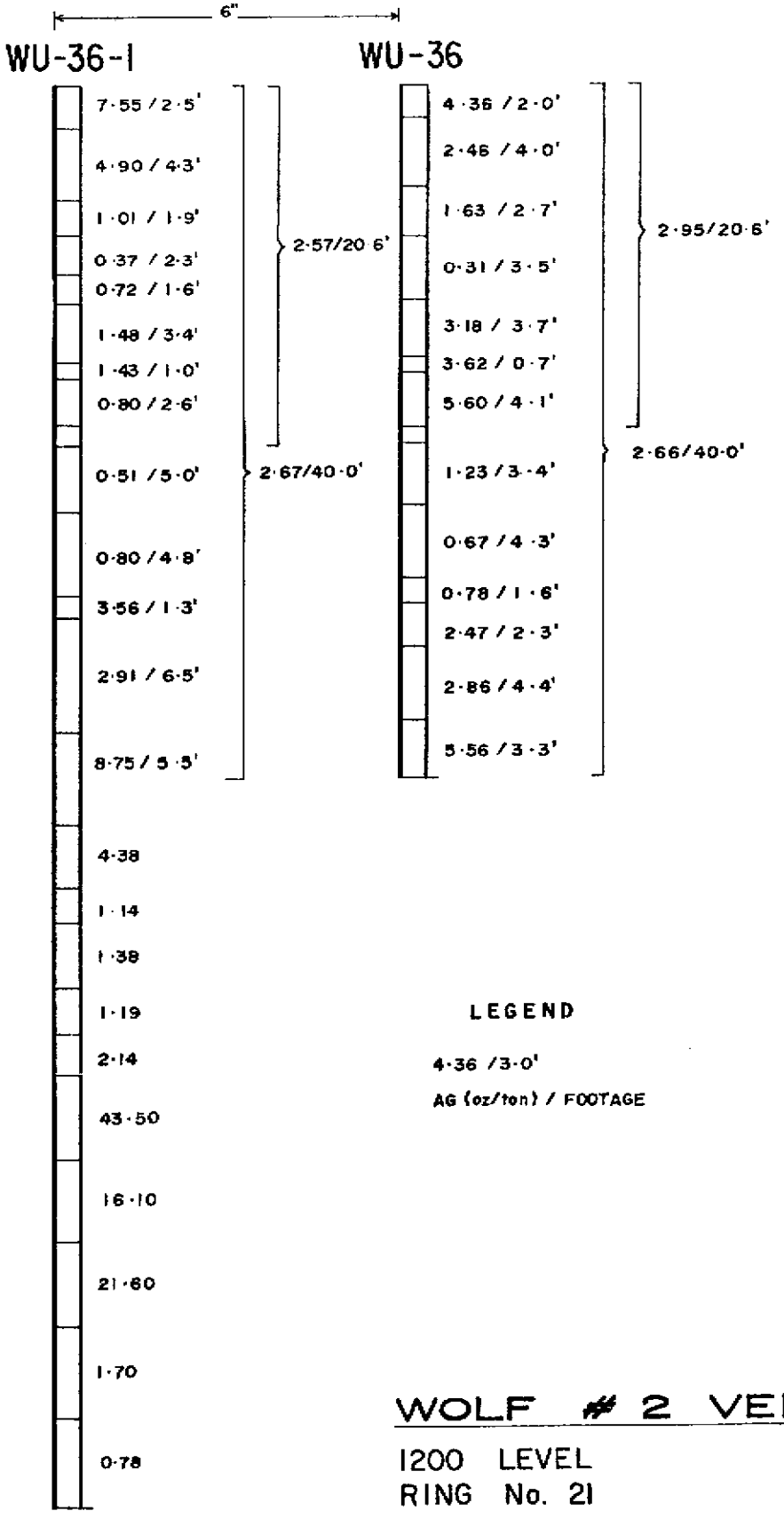
By comparison, recovery for surface diamond drilling at the North Star deposit varied from 94% to 99% averaging 97%. In view of the ground conditions at the Wolf deposit, a core recovery at least equal to that of the North Star is probable.

Core recovery in the 1980 drilling is estimated to be greater than 95%.

Figure B2

Comparison of Silver Assay Results in Diamond Drill Holes WU-36 and WU-36-1 Wolf #2 Deposit

(1980 Drilling)



5.0 CALCULATION PROCEDURES
(Refer to Cross Sections Showing Reserve Blocks)

5.1 CRITERIA FOR INCLUSION OF INTERSECTIONS

Because of the erratic nature of the mineralization, a cut-off grade varying from 0 to 4 oz. Ag/ton was employed. Geological judgement was exercised to include marginal assays to maintain mining continuity. Contiguous assays from drilling and underground sampling were weighted by length and averaged, the results of which are plotted on each section. Average grades were calculated for each ring percussion hole following which the true horizontal width calculated for overall weighting in the blocks. Back samples were typically taken between the collars of the upper percussion holes. These samples, plus one or two, i.e. 2 ft. or 4 ft., adjacent drill hole assay sections, where applicable, were used to estimate the average grade of the drifts.

Normally, Mitchell averaged the nearest pair of back samples bracketing each ring; however, in some cases only one back sample at the ring was used. We have followed Mitchell's practice except for the 1325 drift. Here, the back samples on the ring cross-sections do not correlate with those on the 1325 level map. Since this drift accounts for much of the weighting in the ore blocks, and back samples along the drift are quite variable in silver content, all samples up to one-half the distance to the next ring have been averaged to obtain a more representative mean.

Assays greater than 50 oz. Ag/ton have been cut to 50 oz. following the Torbrit Mine practice. Only one hole, #6 in ring 23 on the 1220 level, was not cut because the high-grade intersections were contiguous along the hole and were confirmed by the 1980 drilling. Although Mitchell (1969) cut the highs on his working sheets, he showed uncut values throughout the deposit in his final cross sections.

As a consequence of cutting these highs several blocks had significant overall grade reductions. These are indicated by an asterisk on the longitudinal section.

Table B5 gives high-grade intersections that were not included in the reserves, together with comments on possible exploitation. Additional exploration will be required to confirm the continuity of the mineralization between most of these intersections.

Table B5

Wolf #2 Vein

Potential Ore Adjacent Existing Workings and at Depth

Cross Section	Hole No.	Grade (oz.Ag/ton)	True Width (feet)	COMMENTS
	Potential Ore adjacent existing workings			
1050N-1100N	1220 Level Ring #3, Hole #3 (+60° W)	21.90	6.0 (0-12') along hole	CWG level assay plan shows a series of back samples from 5' south of Ring #3 (1066N) to Ring #5 (1106N) which average 7.49 oz.Ag/ton 8.5' over a strike length of 40 feet. Although the holes in Ring #5 are of marginal grade in vicinity of the drift, Hole #3, an uphole in Ring #3, intersected a 12 foot section grading 21.90 oz.Ag/ton. A small ore block may therefore be present above the 1220 Level, to the east of the ore reserves in sections 1050N-1100N.
	Back samples Rings #3-#5	7.49	8.5' (strike length 40')	
1300N-1350N	1220 Level Ring #21 Hole #4 (+60°E)	11.90	6.0 (24'-36') along hole	A small potential ore shoot with a 50 foot strike length on the eastern upper side of the 1220 drift.
	Ring 23 Hole #4 (+60°E)	10.15	4.0 (20'-28') along hole	
	Ring 25 Hole #4 (+60°E)	6.03	6.0 (32'-44') along hole	
	Potential ore at depth			
1050N	WU 22	5.30	7.3	Additional drilling and development will be required to prove up reserves.
1000N	WS 83	42.53 (51.53 uncut)	8.3	
900N	WS 96	24.15 (11.77)	3.5' (7.4')	

Table B5
(Continued)

Wolf #3 Vein

Cross Section	Hole No.	Grade (oz.Ag/ton)	True Width (feet)	COMMENTS
	Potential Ore at depth			
1350N	WS79	10.97	21.6	Additional drilling and development will be required to prove up reserves. Hole WS75 is incompletely sampled.
	WU11	3.53	22.0	
1400N	WS80	5.82	7.2'	
1500N	WU16	5.11	15.1	
		(6.83)	(10.0)	
1600N	WS67	6.35	7.1	
	WS73	5.36	7.9	
1700N	WS75	14.30	1.0'	

5.2 RESERVE BLOCKS

Reserves were calculated following Mitchell by locating reserve blocks around each mineralized intersection, and projecting these on to the nearest section. Two, and in some cases three adjacent rings were averaged for blocks centered about the drifts. The average grades in drill holes and in rings in all blocks where data was available were recalculated. Reserve blocks having significant changes in grade, as a result of cutting highs, from Mitchell's reserves are shown with an asterisk on the longitudinal section. The majority of drill logs in the Wolf #1 vein (WS-1 to WS-50) are unfortunately unavailable; hence, only a cursory check of reserves was possible.

Reserve blocks were labelled following Mitchell, i.e. the upper block in a given section is labelled A and subsequent lower blocks B, C, D, etc.

5.3 RESERVE CALCULATIONS

The overall grade and thickness of each block is that of the intersections on which the block is centered. For blocks and sections lacking drill holes, grade has been determined by averaging adjacent blocks, or assuming vertical continuity of grade from the above block. Geological judgement has been exercised to decide which method is the most reasonable for a given block.

As discussed in Section 5.1, high-grade assays were cut to 50 oz./ton except those at hole #6 of ring 23, where cutting was felt to be an unnecessary penalty.

Vertical block thicknesses range from 6 to 142 ft. Widths of blocks measured in the plan of section were determined by projecting blocks half-way to intersections in adjacent holes. Block widths vary from 4.8 to 45.9 ft. The cross-sectional area of each block was measured in the plane of the section. Each block was projected half-way to adjacent sections; hence, the length is a constant 50 ft.

5.4 TONNAGE FACTOR

Mitchell used a 10 cu.ft. per ton factor in his ore reserve calculations and this has been used in this report to enable a ready comparison to his results. The final reserve figure, however, was recalculated at 11 cu.ft. per ton, or the same as for the North Star deposit, on the advice of L. Manning, P.Eng.

5.5 MINED-OUT ORE

A small percentage of ore was mined out during development of the Wolf #1 and #2 veins; this is summarized in Table B6. The average grade of each drift was determined by averaging back samples over the length of ore blocks centered on the drift. As a consequence of this method, the grades of individual drifts in Table B6 are constant across all sections. The grade of the 1220 level is significantly lower than that of the associated ore blocks because the drift is on the lower-grade portion of the vein with the best grade intersections centered to the west of this drift. The average grade of the cross-cuts was determined by averaging the north and south wall channel samples taken by C.W.G. (1969).

Table B6

Summary of Mined-Out Ore

Wolf #1 and #2 Veins
(Tonnage Factor 10 cu.ft./ton; undiluted)

Wolf No. 1. Vein

1550 Sub-Drift

Section	Block	Tonnage (short)	Grade (oz.Ag/ton)
1250N	B	400	12.50
1300	D	400	12.50
1350N	E	400	12.50
1400N	B	80	12.50
TOTAL - @ 10 cft		1280	12.50
@ 11 cft		1164	12.50

1.5% of Wolf #1 ore reserves

Wolf No. 2 Vein

1220 Level

Section	Block	Tonnage (Short)	Grade (oz.Ag/ton)
1150N	B	400 (Drift)	5.31
		96 (W-x-cut)	1.38
1200N	B	500 (Drift)	5.31
		200 (W-x-cut)	7.21
		70 (E-x-cut)	4.27
1250N	C	500 (Drift)	5.31
		49 (W-x-cut)	0.76
		63 (W-x-cut)	7.62
1300N	C	500 (Drift)	5.31
		115 (W-x-cut)	9.71
		85 (E-x-cut)	4.70
1350N	C	500 (Drift)	5.31
		63 (W-x-cut)	11.30
1400N	C	500 (Drift)	5.31
		64 (W-x-cut)	11.02
1450N	D	500 (Drift)	5.31
1500N	D	150 (Drift)	5.31
	TOTAL	4355	5.55

Table B6
(Continued)

1325 Level

Section	Block	Tonnage (Short)	Grade (oz Ag/ton)
1250N	A	450	10.10
1300N	A	450	10.10
1350N	B	450	10.10
1400N	C	450	10.10
1450N	C	450	10.10
1500N	C	450	10.10
	TOTAL	2700	10.10

Total Mined-out ore	1220 Level	4355	5.55
Wolf No.2 Vein	1325 Level	2700	10.10
TOTAL - @ 10 cft		7055	7.29
@ 11 cft		6414	7.29

3.0% of Wolf #2 ore reserves.

Tonnages of individual ore blocks on the longitudinal section have not been corrected for mined-out ore because of the relatively small percentage in each block; however, the overall reserve figure has been adjusted.

6.0 DILUTION

Mitchell (1973) estimated dilution to be 10% at nil grade whereas WEL (1977) assigned a 15% dilution at nil grade. The latter volume estimate of 15% is considered to be conservative for dilution in the Wolf deposit and has been used in this reserve calculation. The Wolf veins are almost vertical and control of dilution should be better than the North Star. Grade of dilution, however, is better than nil and has been calculated using ring percussion drilling in the 1550 sub-drift of the Wolf #1 vein and on the 1220, 1325 and 1550 levels in the Wolf #2 vein. Width of dilution was determined by taking 15% of the ore width in each ring and applying this dilution equally to the footwall and the hanging wall. Grade of dilution in the Wolf No. 1 vein is 1.65 oz. Ag/ton over a length of 1.47 ft. In the Wolf #2 vein grade of dilution is 1.70 oz. Ag/ton over 1.68 ft. For our estimate we have accordingly assigned a dilution of 1.7 oz. Ag/ton for both Wolf #1 and #2 veins.

6.1 PREPARATION OF BULK SAMPLE FOR ORE DRESSING

On the instruction of WEL, we selected assay sample rejects of split drill core of the ore-grade sections from 16 of the holes drilled in rings 17, 21 and 25 in the 1220 level of the Wolf #2 vein. Proportions of hanging and footwall assay rejects were added on a weight basis to represent 15% overall dilution, equally from hanging wall and footwall. The resultant composite sample and its head grade should therefore be reasonably representative of stope ore grade. The weighted average grade of the samples composited above is 12.25 oz. Ag/ton.

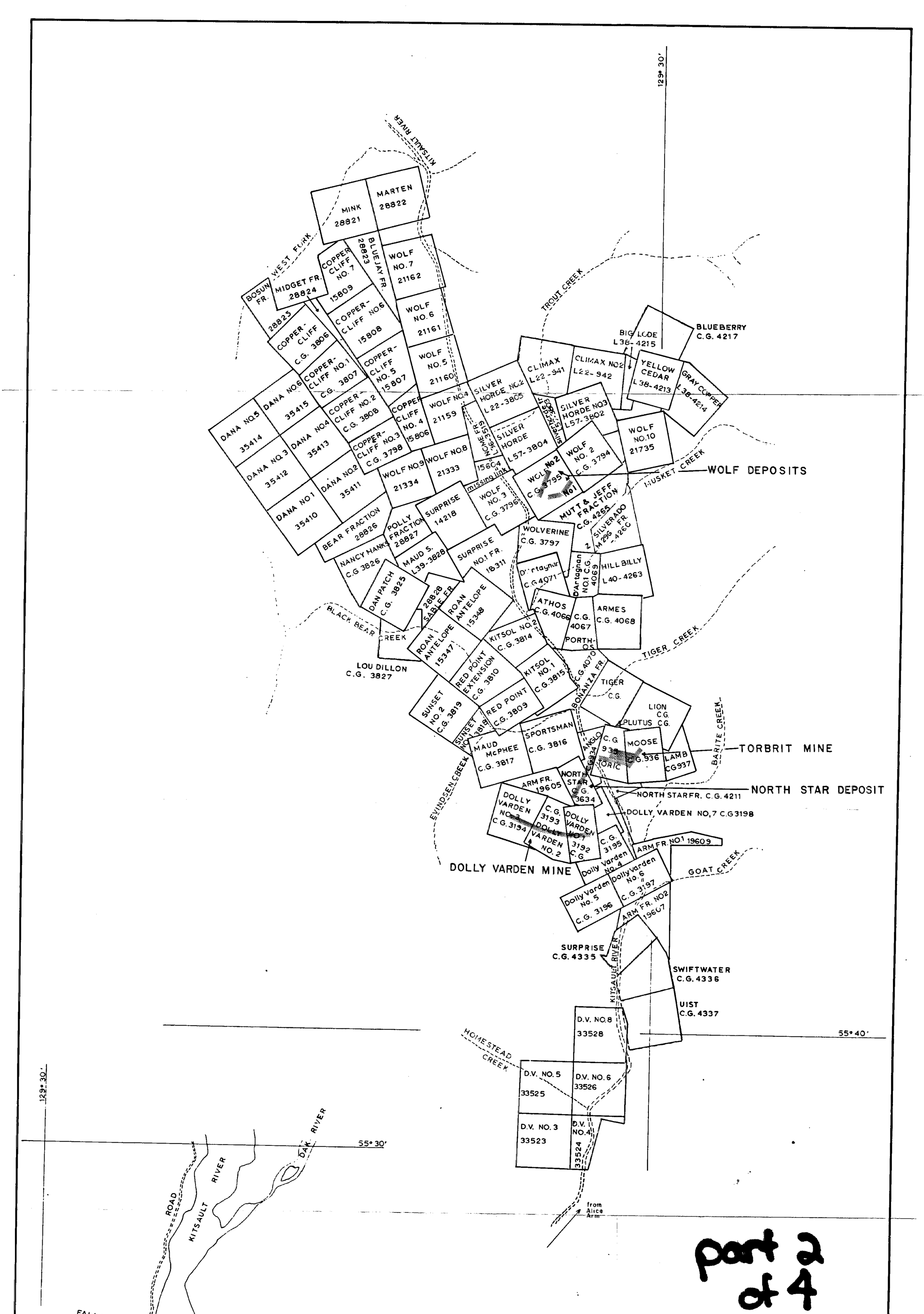
7.0 CALCULATION OF RECOVERABLE RESERVES

In our previous ore reserve estimations in 1969, we allowed for 9,665 tons of ore to be left as surface pillars based on recommendations by Mr. L. J. Manning. Since the preparation of Mr. Manning's provisional mining plans there have been numerous modifications. In our opinion, therefore, the estimation of recoverable reserves is more properly the function of Wright Engineers and we have accordingly made no provision for mining recovery in this report.

8.0 CATEGORIZATION OF RESERVES

The Wolf #1 and #2 deposits have been defined and sampled by 4 levels, 1 raise, 126 diamond drill holes, and 45 rings of percussion drill holes, the latter at 10 to 40 ft. intervals. Core recovery in drilling and the reliability of the assays from the ring percussion drilling programme have been satisfactory and independent check assaying of duplicate samples has confirmed the general validity of the wet chemical analyses.

Our correlation of geology and mineralization, although not as well documented as for the North Star deposit, indicates, however, that three-dimensional continuity of the mineralization is reasonably well-established and provides an appropriate base for this reserve calculation, which we are of the opinion meets the criteria for classification as Proven, Probable and Possible ore.



part 2 of 4

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
10042

DERRY, MICHENER & BOOTH

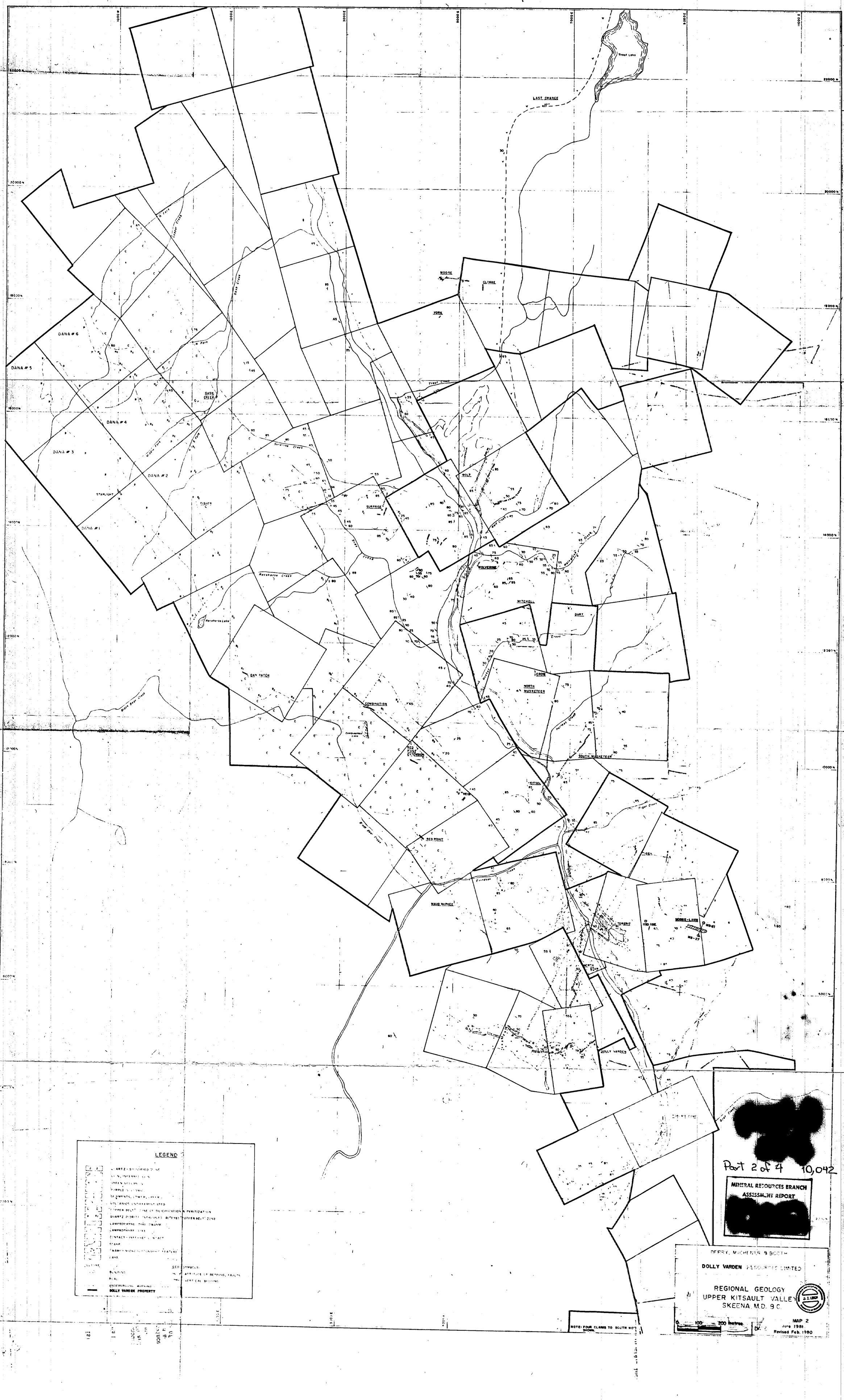
DOLLY VARDEN RESOURCES LIMITED

CLAIM MAP

N.T.S. SHEET 103 P

SCALE: 1 Inch = 1500 Feet | DATE: November 1979

Map 3



LEGEND

- QUARTZ - SILICIFIED ZONE
- SILICIFIED ZONE
- GREEN VOLCANICS
- PURPLE VOLCANICS
- SEDIMENTS, LOWER, UNDIV.
- VOLCANICS UNDIFFERENTIATED
- UPPER BELT - ZONE OF SILICIFICATION & PYRITIZATION
- QUARTZ DIORITE INTRUSIVES ALTERED - UPPER BELT ZONE
- LAMPROPHYRE DIKE SWARM
- LAMPROPHYRE DIKE
- CONTACT - INFERRED, CONTACT
- SCARP
- SWAMP, MUSKEG OR SWAMPY FEATURE
- LAKE
- CULTURE
- BUILDING
- ROAD
- UNDERGROUND WORKING
- DOLLY VARDEN PROPERTY
- GEO SYMBOLS
- ATTITUDE OF BEDDING, FAULTS
- VERTICAL BEDDING

Part 2 of 4 10,042

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT

[redacted]

DERRY, MICHENER & BOOTH

DOLLY VARDEN RESOURCES LIMITED

REGIONAL GEOLOGY
UPPER KITSAULT VALLEY
SKEENA M.D. B.C.

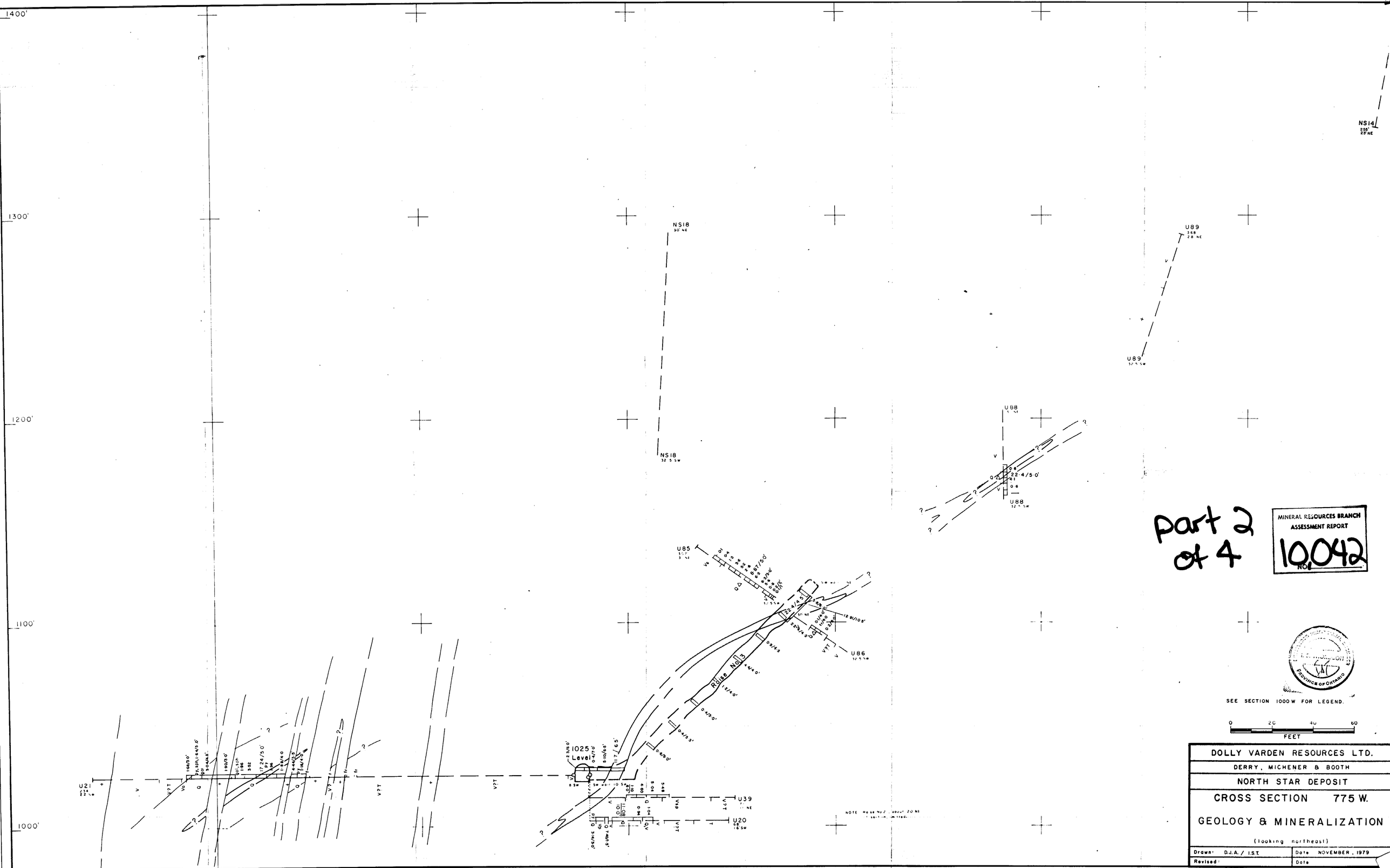
0 100 200 metres

MAP 2
June 1981
Revised Feb. 1980

SEE SECTION 1000 W FOR LEGEND.

0 20 40 60
FEET

DOLLY VARDEN RESOURCES LTD.	
DERRY, MICHENER & BOOTH	
NORTH STAR DEPOSIT	
CROSS SECTION 715 W.	
GEOLOGY & MINERALIZATION (looking northeast)	
Drawn: DJA / I.S.T.	Date NOVEMBER, 1979
Revised:	Date:



part 2 of 4

SEE SECTION 1000 W FOR LEGEND.

0 20 40 60
FEET

DOLLY VARDEN RESOURCES LTD.

DERRY, MICHENER & BOOTH

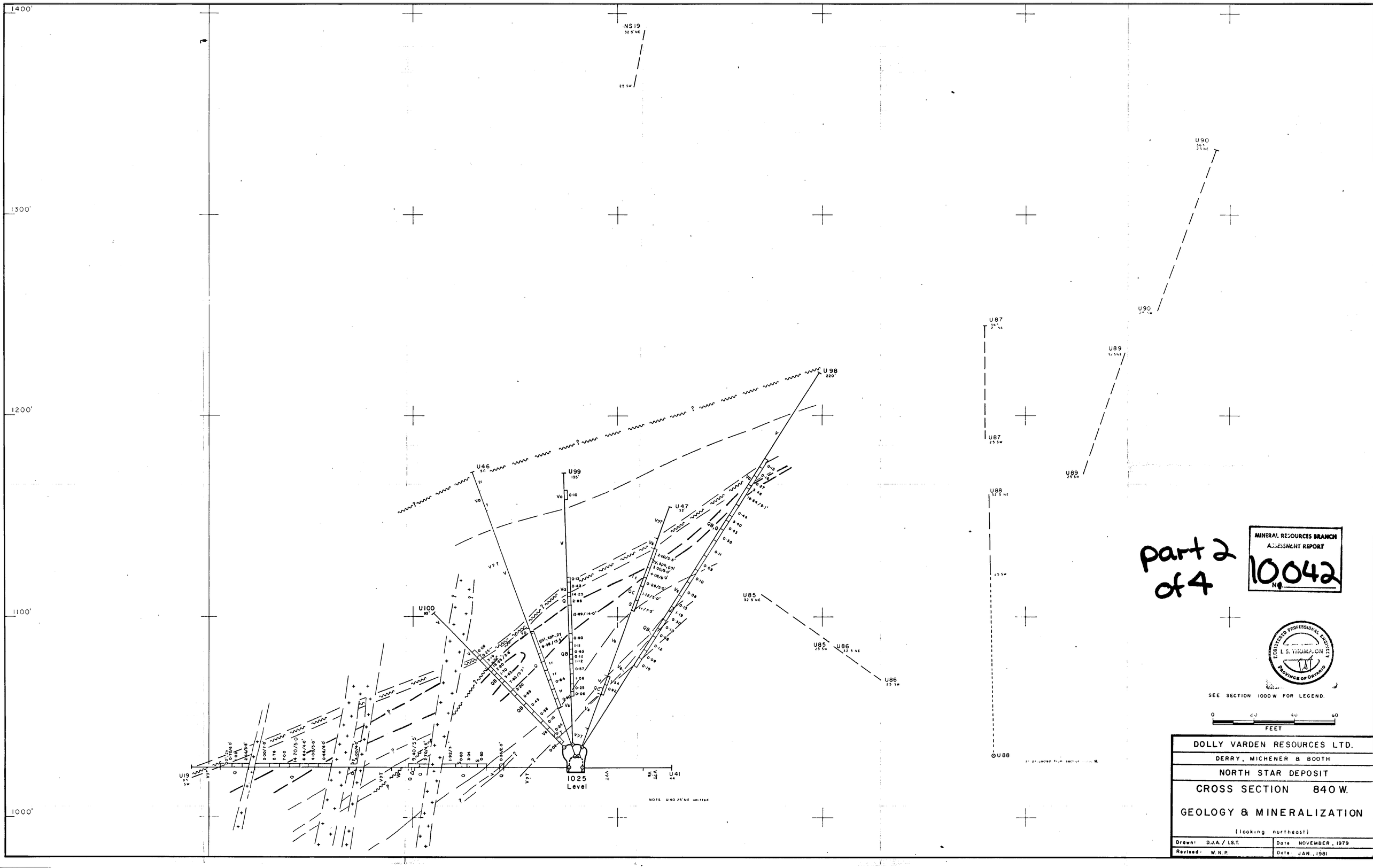
NORTH STAR DEPOSIT

CROSS SECTION 775 W.

GEOLOGY & MINERALIZATION

(looking northeast)

Drawn: D.J.A. / I.S.T.	Date NOVEMBER, 1979
Revised:	Date



part 2 of 4

MINERAL RESOURCES BRANCH
ASSESSMENT REPORT
10,042
NO.

REGISTERED PROFESSIONAL ENGINEER
I. S. THOMPSON
PROVINCE OF ONTARIO

SEE SECTION 1000 W FOR LEGEND.

0 20 40 60
FEET

DOLLY VARDEN RESOURCES LTD.

DERRY, MICHENER & BOOTH

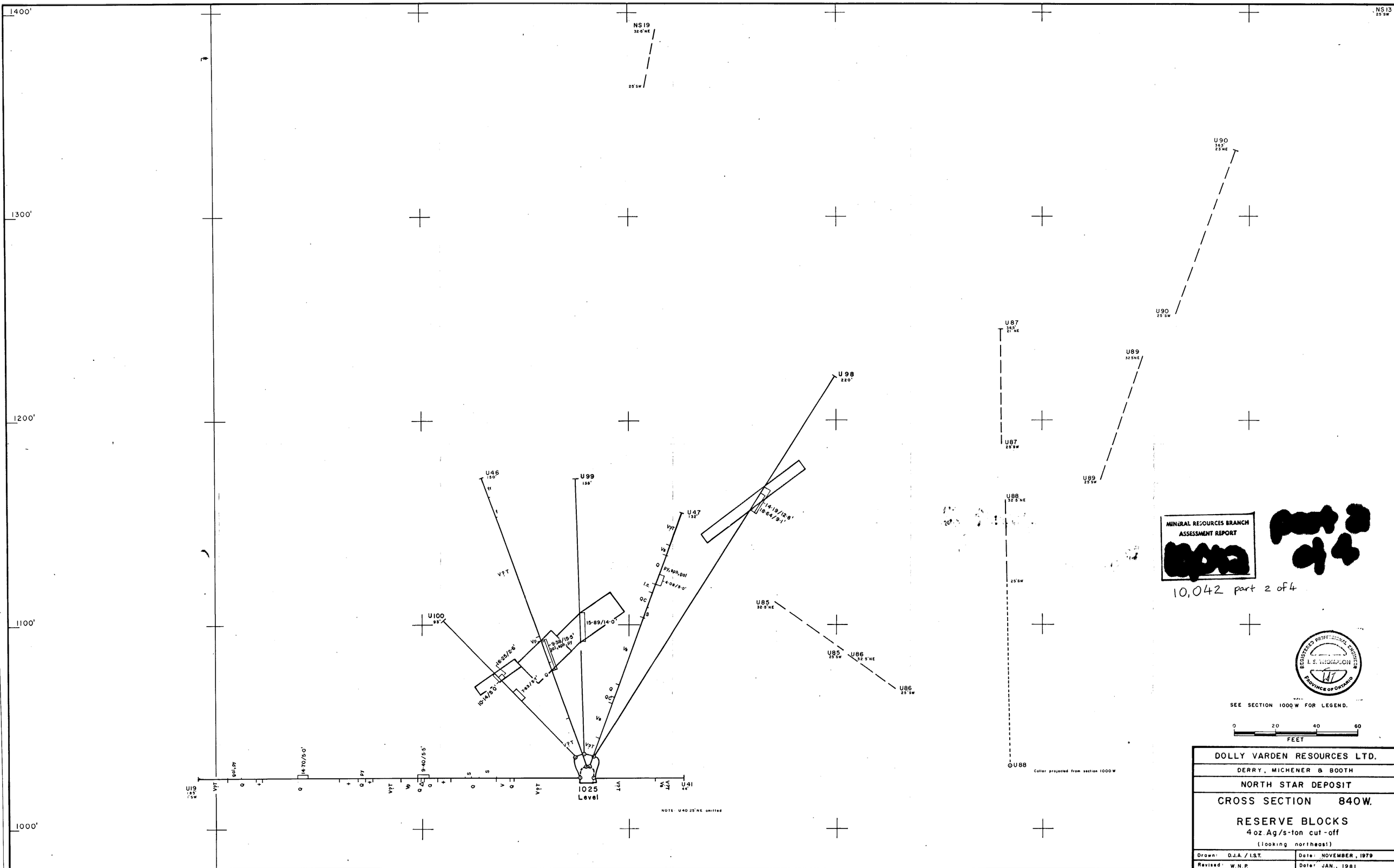
NORTH STAR DEPOSIT

CROSS SECTION 840 W.

GEOLOGY & MINERALIZATION

(looking northeast)

Drawn: D.J.A. / I.S.T.	Date NOVEMBER, 1979
Revised: W.N.P.	Date JAN., 1981



SEE SECTION 1000W FOR LEGEND.

0 20 40 60
FEET

DOLLY VARDEN RESOURCES LTD.
DERRY, MICHENER & BOOTH
NORTH STAR DEPOSIT
CROSS SECTION 840W.
RESERVE BLOCKS
4 oz. Ag/s-ton cut-off
(looking northeast)

Drawn: D.J.A. / I.S.T.	Date: NOVEMBER, 1979
Revised: W.N.P.	Date: JAN., 1981