

44-912 - 15451

ASSESSMENT REPORT  
1986 DIAMOND DRILLING

LITTLE GEM PROPERTY

Crown Grant Lots 7566, 7567, 7568, 7727  
7728, 7729, 7730, and 7731

Located Claims Aura 1-20 (4 units)  
Henabil 1 (20 units)  
Roxey (15 units)

Work done on Little Gem Crown Grant - Lot 7567

Lillooet Mining Division  
NTS 92 J 15W  
538'  
50° ~~E4~~'N; 122° 57'W

for

ANVIL RESOURCES LTD

Owner and Operator

by

Charles A.R. Lammle, PEng

17 Dec 1986

**GEOLOGICAL BRANCH  
ASSESSMENT REPORT**

**15,451**

*Charles A.R. Lammle PEng*

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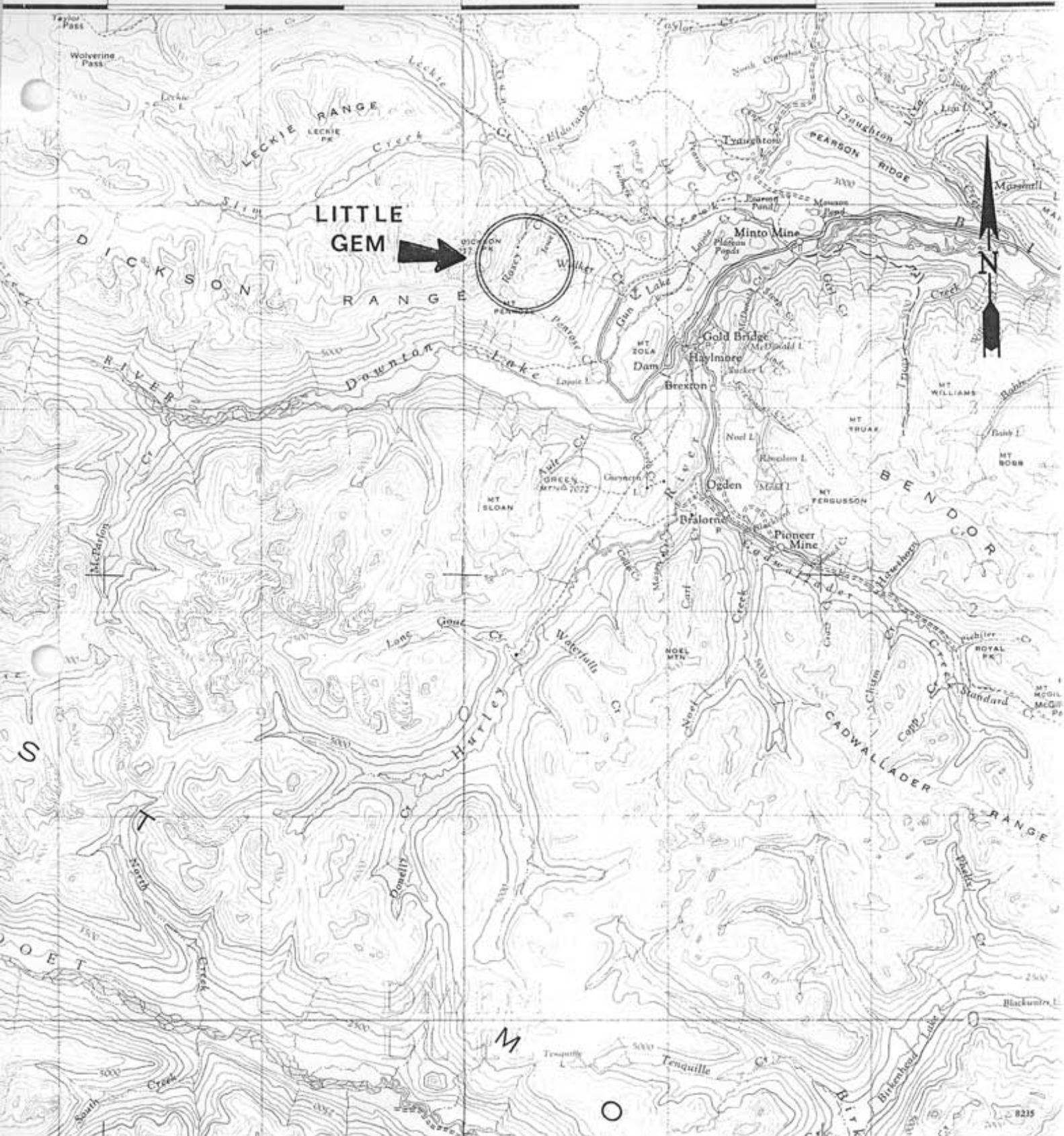
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Plate 1. Little Gem Property, Surface Plan	Pocket

15'

123°00'

45'



**LITTLE GEM**  
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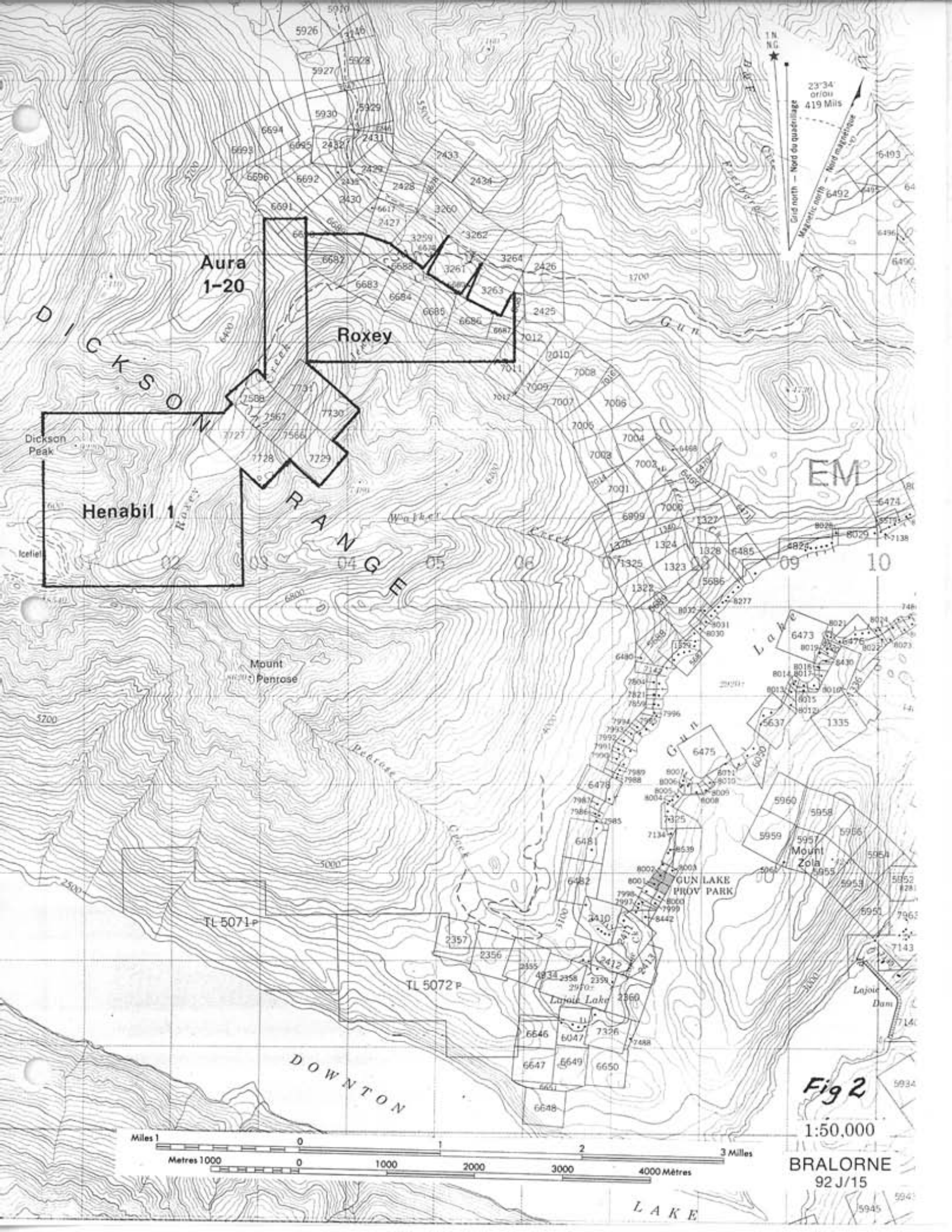
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PEMBERTON  
 T 92 J

Fig 1

Pemberton Meadows

IFIC



**Aura 1-20**

**Roxey**

**Henabil 1**

**EM**

**Mount Penrose**

**GUN LAKE PROV PARK**

**Mount Zola**

**Fig 2**

1:50,000

**BRALORNE 92J/15**



TL 5071 P

TL 5072 P

**L A K E**

ASSESSMENT REPORT  
1986 DIAMOND DRILLING WORK  
Little Gem Property  
Lillooet Mining Division NTS 92J15

INTRODUCTION AND SUMMARY

During 26Sept-5Nov1986, Anvil Resources drilled 373.8m of BQ core in two holes centrally on the Little Gem Crown Grant - DDH 86-1 and 86-2 - after having earlier prepared drill sites and pads by Caterpillar 977 track-type front end loader. The site work commenced 5Jul86 and was completed during mid-summer at irregular intervals subject to break-up, snow conditions, and frequent heavy rains. The drilling was directed to test an exploration concept that resulted from ancillary surface geological mapping done during 15-18Jul86 by C.A.R. Lammle, PEng. Results of the drilling are described herein and logs for the two holes are attached.

The Little Gem crown grant hosts a small high-grade Co-Au-As deposit in hornblende biotite quartz diorite of the Bendor Intrusives which are part of the Coast Crystalline Complex. The property is located 9.6 km northwest of Gold Bridge, B.C., which is in the eastern part of the Pacific Ranges of Coast Mountains, and is accessible from that town via the Gunn Lake and Gunn Creek roads to Jewel Creek bridge, and then via old overgrown 4x4 road up Roxey Creek to an old camp on the crown grants.

Over the past several decades much work has been done on the Little Gem 4, including three adits, and appreciable underground diamond drilling. Typical engineering reserve estimates are in the range of 10,000 to 20,000 tons with grade ranges of:

gold	0.5 - 0.7 oz/short ton
cobalt	2.5 - 3.0%
arsenic	25 - 27%

The dominant sulphide mineral is arsenopyrite which is both cobaltiferous and auriferous. Intergrown with the arsenopyrite is some safflorite and 20 $\mu$  gold. Additionally, appreciable allanite is present, bearing some considerable amounts of cerium and very likely some thorium as well. Smaller amounts of lanthanum- and neodymium-bearing bastnaesite and monazite are also among the ore minerals.

The object of the drilling was to test the west-northwesterly projection of a fault that passes through the showings for additional mineralization. Additional complicating faults with both steep and flat dips, and with generally unknown displacements were recognized as contributing to exploration risks.

## PROPERTY DESCRIPTION

The property consists of the following claims:

### Crown Grants

Little Gem 2	Lot 7566	34.90 acres
Little Gem 4	Lot 7567	34.49 acres
Little Gem 6	Lot 7568	46.99 acres
Little Gem 11	Lot 7729	51 acres approx
Little Gem 15	Lot 7727	49.87 acres
Little Gem 16	Lot 7728	49.57 acres
Little Gem 17	Lot 7730	51.63 acres
Little Gem 18	Lot 7731	49.14 acres

-----  
367.59 acres or 148.87 ha

### Located Claims

Roxey	15 units
Aura 1-20	4 units
Hensabil 1	20 units

Configuration and location of these claims are shown on Figure 2, attached.

## ACCESS

The Little Gem 4 workings are located 9.6km due northwest of Gold Bridge, B.C., a small town accessible from Lillooet, and during summer months via Pemberton over the Hurley Forest Access road.

From Gold Bridge, the property may be reached by following the Gunn Lake Road to the north end of the lake, some 35 km, then northwesterly up Gunn Creek valley some 13 km, and then westerly and southwesterly up the mountain along Roxey to the old Gem Camp, about 10 km, at elevation of 1710m, and to the lower workings at elevation 1890m. The upper tunnel is at elevation 1905m.

## PHYSIOGRAPHY

The property is located in the eastern part of the Pacific Ranges of Coast Mountains. The Pacific Ranges are characterized by granitic mountains having a width of 125 - 160 km. The high peaks have been sculptured by cirque glaciers; many projected as nunataks above the Pleistocene ice cap, the upper surface of which was 1500 - 2500m above sea level. The lower summits were covered by the ice sheet and are rounded and domed, but their northeast sides are scalloped by the cirque weathering action, and more recently by alternate freezing and thawing of cornice meltwater. The effects of ice erosion are everywhere to be seen, and extensive ice fields remain.

Drainage patterns are controlled by bedrock structures, principally strong northwesterly faults and lithological contacts. The mountains are openly timbered to elevation 1800m with fir, spruce, and pine with light undergrowth.

#### PREVIOUS WORK

The showings were discovered by W.H. Ball and William Haylmore who sold the property in 1937. Underground work was begun during 1938-1939. Bralorne Mines optioned the ground in 1940. During 1952, Estella Mines did limited drilling from the lower level and relinquished the property in 1953. J.L. Stevenson of the Department of Mines sampled the workings in 1948; generalized grade from his 39 samples taken over widths from 0.3-2.0m are as follows:

gold	0.78 oz/ton
cobalt	2.91%
arsenic	38%

Anvil's work has consisted of data compilation, geology, geochemistry, geophysics, trenching and drilling.

#### OBJECT OF THE PRESENT WORK

Limited geological mapping done in mid July 86 by C.A.R. Lammie, PEng, with the aid of Messrs W. Smith and H. Gebauer defined a known west-northwesterly fault that passes through the main workings on the steep mountain face, and through old hand cuts with mineralization, on the divide between Jewel and Roxey Creeks. Exploration possibilities under overburden along strike of this fault in Roxey Creek Basin were conceived. Two holes were recommended to test the easterly projection of the fault at the headwaters of Jewel Creek; and the two holes herein documented were recommended to test the strike extension of the fault in Roxey Creek Basin.

Projection of this fault line for any great distance is risky because the area of the Gem Mineralization through which it passes is an area of complex faulting and complex fracturing, and hence there is an inherent risk that the fault itself is cut and offset.

#### GENERAL GEOLOGY

The workings are located centrally, or along the axial region of an apophysis of Bendor quartz diorite (Cretaceous or Tertiary) that extends southeastwards from Dickson Mountain across Roxey Creek to Gunn Lake. It is intrusive into Fergusson Series cherts, argillites and limestones on the southwest; Noel Formation argillites and tuffs, and serpentine and serpentinitized peridotite

on the northeast. Being on the axial portion of the apophysis, it is reasonable to expect that near the workings, the quartz diorite is only shallowly unroofed, or in other words, that a vertical geological section would suggest that prior to erosion, the area of the workings would not be far below a former contact with the older rocks, probably those of the Noel Formation.

The preliminary mapping supports this thought. The country rock is medium grained hornblende biotite quartz diorite which contains in places fairly abundant xenoliths of recrystallized volcanic? rock that in all probability represents blocks that were incorporated into the quartz diorite during intrusion.

The mapping generally shows the hornblende biotite quartz diorite to be relatively unaltered. At the showings, however, it appears to be contain a younger more felsic intrusion, and an occasional lamprophyre dyke, and it is much faulted and fractured. Some of the stronger faults have acted as a plumbing system along which hydrothermal fluids migrated, and these have ankeritic alteration along them, and at the workings heavy to massive sulphide mineralization. The principal controlling fault system mapped trends east-southeasterly and dips at a steep angle into the mountain to the south; it is mineralized at the workings and near the divide between Roxey and Jewel Creeks, and is covered by overburden in the cirque basin of Roxey Creek.

The projections along strike of this fault system have exploration potential both to the west and east, but complicating later faults of both steep and flat dips could offset the projections.

#### DIAMOND DRILLING WORK

During 26Sept-5Nov86 two BQ diamond drill holes were drilled by Anvil Resources Ltd. on the Little Gem 4 Crown Grant. Details of these holes are as follows:

	Bearing	Inclination	Length
DDH 86-1	Az 123°	-47°	166.1m
DDH 86-2	Az 123°	-41.5°	207.7m

The only measurement taken for inclination of these holes was taken at the collars. Cores were recovered with 1.524m core tube, and placed in 1.524m core boxes. Collar locations and elevations were not surveyed. Recovery was very high, probably exceeding 98 or 99%, although no effort was made to measure it; suffice to say that almost every run looked complete. Cores are presently stored out of the weather in the town of Gold Bridge at the residence of W.T.A. Smith, Esq.



#### DIAMOND DRILL HOLE 86-1

Diamond Drill Hole 86-1 cored igneous rock throughout. It was collared in medium grained, slightly magnetic, hornblende biotite quartz diorite that contains occasional dark coloured, recrystallized xenoliths. In places the rock is propylitically altered, particularly between depths of 76 and 134m, and generally where altered, the rock has a very inhomogeneous igneous texture, somewhat suggestive of xenoliths and former country rock in all stages of dioritization, mixed in with the quartz diorite. The usual suite of alteration minerals - principally chlorite, quartz, some epidote and pyrite - in locally variable quantities, accompany the propylitic alteration, and in several places small veins and seams of pink potassium feldspar with translucent quartz may represent potassic metasomatism or potassic segregation. Minor chalcopyrite mineralization was noted in a number of places in the core.

Minor faulting was noted at 73.7m.

A fine grained hybrid-looking dacite-like rock was cored between 105 and 111.5, and a very interesting fine grained red-brown ankeritic looking rock between 119.5 and 125.5m. The latter section of red-brown rock contains several percent of disseminated fine sulphides, mostly iron sulphides and minor chalcopyrite, and some sections are suggestive of allanite, sphene and carbonate minerals. Mineralogical work would be necessary for accurate identification of all minerals present. During drilling, it was believed that this zone was an extension of the alteration zone so prominent at the working on the steep mountain side.

Rock in the last 30m or so of the hole is relatively unaltered, or fresh hornblende quartz diorite, medium grained and moderately to weakly magnetic as tested with suspended pencil magnet.

#### DIAMOND DRILL HOLE 86-2

This hole cored similarly hypidiomorphic granular hornblende biotite quartz diorite, as in hole 86-1, and the rock contains similar but fewer fine grained dark coloured xenoliths. Propylitic alteration is present but weaker than in the first hole, and there is a smaller amount of pink seams of potassium feldspar-quartz segregation or metasomatism. Several stronger faults with crushed gougy envelopes are present, a number of which are near the bottom of the hole.

The main differences in the second hole to be noted is that large portions of the core consist of a finer grained, lighter coloured quartz diorite that sometimes has gradational contacts with the usual variety, but sometimes has sharp contacts as at 54.9m. The significance of this rock type is not presently known: it was not

noted on the surface, and was not recognized as such in the first hole - it may be a separate intrusive type, or it may possibly be large blocks of recrystallized felsic country rock.

Minor fine disseminated sulphides, mainly iron sulphides and minor chalcopyrite are present at rare intervals, and there is no zone of red-brown altered-looking rock as in 68-1, and as was suspected to be present because of the alignment of the drilled sections and the Little Gem Workings.

The hole ends in relatively fresh, unaltered hornblende biotite quartz diorite. No important mineralization was recognized in it.

#### MINERALIZATION

Limited mineralogical work has been done recently by two large companies on hand specimens gathered during an examination during the summer in one case, and in the other case, during 1984. Those companies' work indicated that the principal sulphide present was heavy to massive arsenopyrite, partly altered to safflorite, which contain important amounts of both cobalt and gold. Skutterudite is associated with the arsenopyrite. From polished sections, gold with associated maldonite was reported as being present as 20 $\mu$  inclusions in the arsenopyrite. Minor molybdenite and gersdorffite have also been reported.

Appreciable allanite was shown by X-ray diffraction to be present, and is assumed to be the carrier of important amounts of cerium and of small amounts of thorium; lanthanum-bearing bastnaesite and monazite were also found.

#### INTERPRETATION OF DRILLING RESULTS

Continuation of the Little Gem 4 mineralization was not encountered in either 68-1 or 68-2, and it is not certain whether the projection of the target fault zone was intersected. Faults mapped in 68-2 could well be the same as the target fault, but could equally well be unrelated faults of different attitudes. Strong flat-dipping faults have been mapped on the cliffs above the collar, between the workings and the drill holes, and these flat faults have been suspected by previous workers to offset the mineralization.

The alteration noted in the two holes suggests intensity increasing with distance westerly. This is generally away from the Little Gem Workings, and so is unexpected and not readily explainable on the basis of the information at hand.

Both holes contained minor disseminated fine sulphides, mostly iron sulphides, but no important mineralized sections were noted.

ITEMIZED STATEMENT OF EXPENDITURES INCURRED

Drilling Costs

Boyles Brothers BBS-1 rental and crew, Cat 977 loader;  
all up rental rate  
15.00/ft all up

1226 ft x \$15.00/ft = \$18,390

Certificate of Core Logger

I, Charles A.R, Lammle, PEng, resident of Burnaby, B.C. hereby certify that:

1. I am a registered member of the Association of Professional Engineers of the Province of British Columbia.
2. I am a 1962 graduate of the University of British Columbia, BAsC. Geological Engineering.
3. I have practiced my profession nearly continuously since graduation, mostly in British Columbia and Yukon, and partly in the western United States including Alaska.
4. I am personally familiar with the Little Gem Property, with the literature available on the property, and have carried out limited geological mapping at the prospect. I have personally examined and logged all of the core from the 1986 drilling, and have made it available to Anvil Resources for purposes of this assessment report.

Respectfully submitted



C.A.R. Lammle, PEng.  
18Dec1986

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# DIAMOND DRILL RECORD

DIP TEST		
		Angle
Footage	Reading	Corrected

PROPERTY NORTHERN GEM

HOLE No. 86-1

Hole No. 86-1

Sheet No. 7

Lat. \_\_\_\_\_

Total Depth \_\_\_\_\_

Section \_\_\_\_\_

Dep. \_\_\_\_\_

Logged By \_\_\_\_\_

Date Begun \_\_\_\_\_

Bearing \_\_\_\_\_

Angle \_\_\_\_\_

Claim \_\_\_\_\_

Date Finished \_\_\_\_\_

Elev. Collar \_\_\_\_\_

Core Size \_\_\_\_\_

*ift = 0.305 m*

Box	Block	Rec'd	Depth	Rock	Alt'n	Struc	Description	Mineralization	Min	Sample No.	Width				
1	2	3	350	5		7	f.g. gray to light gray dacite-looking or quartz dacite rock, weakly magnetic	minor sulphides py, cpy pyr on fracture planes							
			360	d			dacite rock terminates at a reticulate fracture zone	minor py.							
			370				orange-pink alteration mineral coats fracture planes								
			380	gd			weakly magnetic f.g. gray altered gtz diorite. Appearance is similar to rocks up the hole, but fewer quartz eyes								
			390				altered gtz diorite - grading thru alt gtz dior to porphyry & back to alt gtz diorite	moderately magnetic							
			400	rd			fine grained red-brown rock looks like ankeritic alt, but is hard, doesn't scratch, pinkish cast, some phlogopite mica peculiar fine grained mineral like sphene, or possibly something like allanite? quartz seams	mag, py, cpy epidote, mariposite? in drusy open- space fillings							
			406												

16  
17

17  
18

























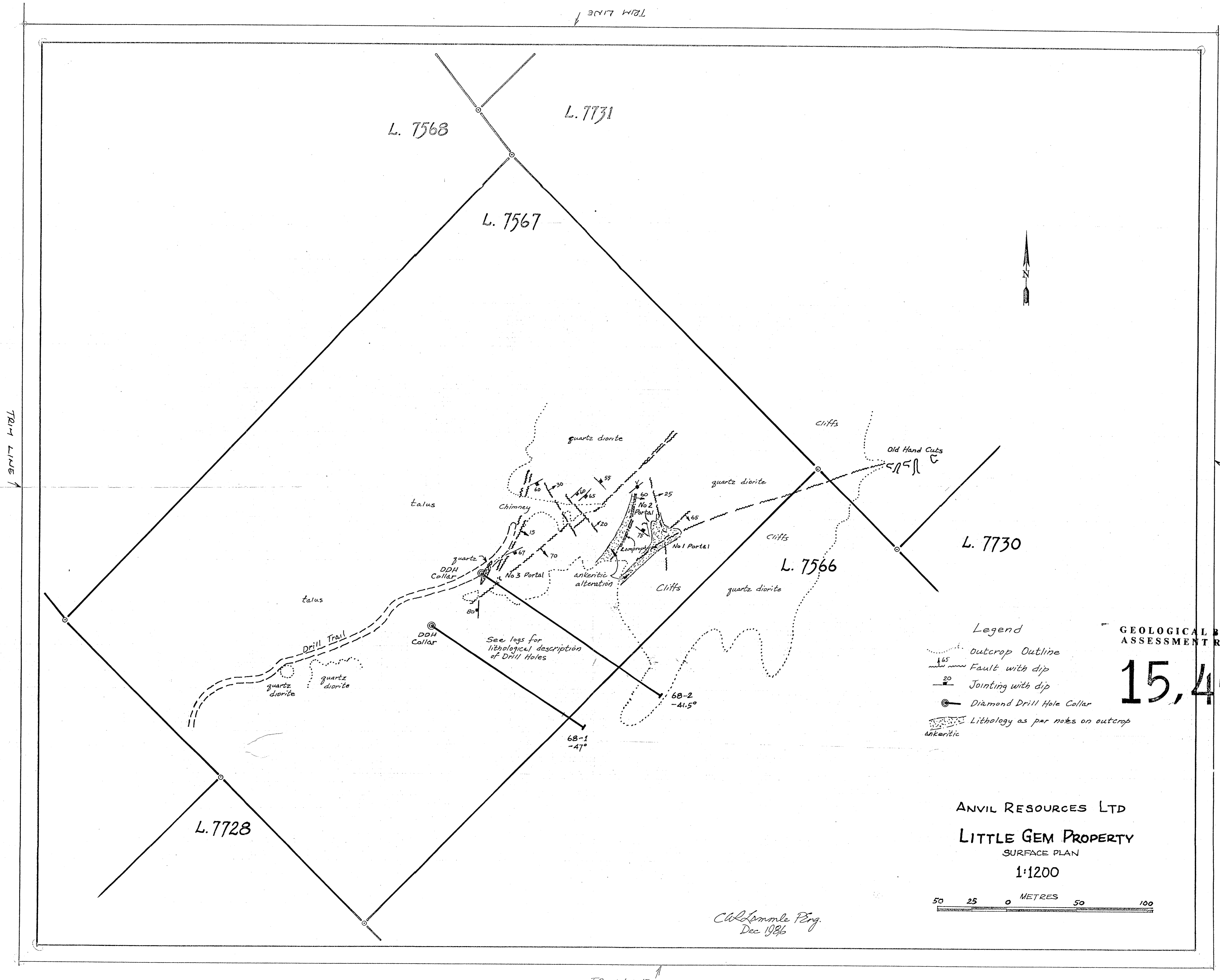












GEOLOGICAL BRANCH  
ASSESSMENT REPORT

15,451

ANVIL RESOURCES LTD

LITTLE GEM PROPERTY

SURFACE PLAN

1:1200

50 25 0 METRES 50 100

C. W. Lamonde P. Eng.  
Dec 1986