

# CORPORATION FALCONBRIDGE COPPER

MEMORANDUM

827253

DATE: February 21, 1986

TO: A. J. Davidson

COPIES TO: FILE

FROM: D. V. Lefebure

SUBJECT: Property Evaluation of the Tunnel Hill Property, Vancouver Island  
NTS 92B/5E & 92B/12E

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## Introduction

A prospector resident in Duncan, Lionel Scott, showed me his claims located along the Malahat Highway this past fall. The claims are located in the Victoria Mining Division approximately 30km south-southwest of Duncan and 12km west-northwest of Victoria.

## Ownership

The Tunnel Hill Property consists of 9 claims (Figure 1) owned by:

Lionel J. Scott

R. R. #2

Payne Road

Duncan, B. C.

(604) 748-7007

## Previous Work

The Tunnel Hill area was examined in 1966 by the E. and N. Railway Company prior to giving up their mineral rights. They found a weakly mineralized zone (0.16% Pb, 0.02% Cu, 0.01% Zn in a grab sample) beneath the railway tunnel. They carried out soil sampling and self potential lines. The S.P. Survey identified four anomalous areas of questionable significance.

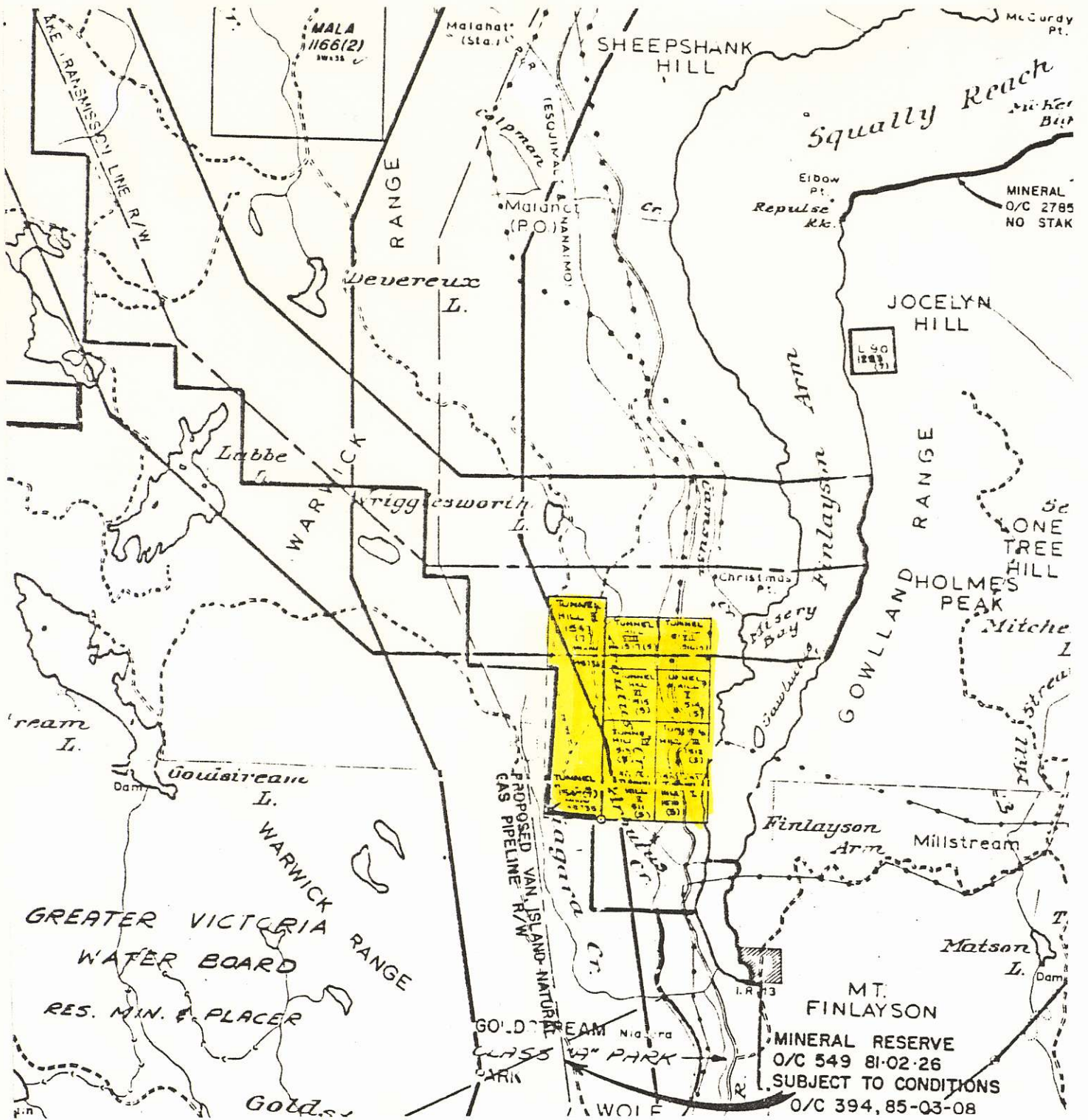


Figure 1 Location of Tunnel Hill claims.

Geology

Triassic to Cretaceous age Leech River argillite, metagreywacke, ribbon chert, metarhyolite and metabasalt (Muller, 1980) underlie the claims. The exposures examined in the field were cherts, sandstones, argillites, cherty argillites and minor felsic(?) tuff. Gossany outcrops are prominent in the Tunnel Hill area and reflect oxidation of disseminated pyrite and arsenopyrite. Analyses of grab samples indicate geochemically anomalous amounts of zinc and possibly copper and gold (Table 1). However, they are not high enough to warrant further investigation.

Conclusion

No further follow up of this property is necessary.



D. V. Lefebvre

DVL/ik

Table 1. List of analyses of grab samples from Tunnel Hill  
Property

Values in %	Al <sub>2</sub> O <sub>3</sub>	Ba	CaO	Fe <sub>2</sub> O <sub>3</sub>	K <sub>2</sub> O	MgO	MnO <sub>2</sub>	Na <sub>2</sub> O	Pb	SiO <sub>2</sub>	TiO <sub>2</sub>	Zr
TUNNEL HILL#1	5.42	.272	1.16	12.65	1.31	2.06	.41	.05	.008	75.49	.30	.005
TUNNEL HILL#2	16.65	.060	5.00	12.95	.63	5.08	.44	4.00	.005	51.10	2.60	.015
TUNNEL HILL#3	2.53	.013	3.89	3.75	.43	.89	.35	.03	.005	82.21	.14	.005
TUNNEL HILL#4	13.89	.262	.57	3.92	6.23	1.50	.42	1.55	.005	69.55	.49	.007
TUNNEL HILL#5	6.75	.043	3.01	19.32	.33	3.25	.58	.02	.012	64.30	.42	.008
TUNNEL HILL#6	4.51	.005	.32	12.62	.19	1.82	.17	.01	.006	78.42	.31	.005
TUNNEL HILL#7	12.88	.072	4.19	12.76	.53	4.74	.44	2.69	.010	58.54	1.77	.011
TUNNEL HILL#8	10.34	.037	.37	6.89	1.52	1.69	.17	.63	.018	75.74	.49	.005

Cu ppm   Zn ppm   Au ppb

TUNNEL HILL#1	190	270	24
TUNNEL HILL#2	109	168	3
TUNNEL HILL#3	74	120	17
TUNNEL HILL#4	71	71	20
TUNNEL HILL#5	230	340	27
TUNNEL HILL#6	40	82	18
TUNNEL HILL#7	100	132	2
TUNNEL HILL#8	49	138	6

# EN. 108

C.P.O.G. Ltd. MINING AGREEMENT NO. 17.

First Annual Report, 1967.

*Tunnel Hill Property*

PERIOD OF REPORT

This report covers work done on the property in the 1966 season to December 31st. It is submitted in advance of the anniversary date of the Agreement, May 1st, 1967, as little further definitive work can be expected prior to that date.

1966 PROGRAM

The initial program was designed to examine the source of heavy rust encrustations found to have developed along the face of the rock cut on the west side of the Island Highway in the vicinity of Mile 13, which appear to be associated with heavy metals indications found in under-water silt sampling along the southwest shore of Finlayson Arm.

GEOLOGY

The rocks of the area are mapped as the Malahat Volcanic Series, and appear to be underlain by two of the early intrusives which outcrop both to the west and east. Some of the rock found is reminiscent of the older Leech series, and contains similar areas of graphitic material, but the quartz injections frequently found in the Leech shales are generally limited to flat lying fracture planes which traverse the area and were apparently produced by heaving on the Finlayson Arm side.

The general run of the formation is almost due east-west, with schistosity and fractures dipping near the vertical. The above mentioned horizontal fracturing appears to be of later origin, probably associated with the heaving of the underlying intrusives from which the quartz filling is presumably derived.

Seepage waters originating in the high ground to the west find their outlet along the steep slope on the Finlayson Arm side. It is at these seepage outlets along the rock cut that the encrustations have developed.

MINERALIZATION

Rock examination showed appreciable sulphide mineralization, the strongest being in the vicinity of the point of land opposite Sawluctus Island and below the Railway tunnel, where a strong east-west fault runs back from the shoreline beyond the first ridge, and then bears round to the south.

Of eight sets of rock samples taken for minerals identification, spectro assays showed the following metals present:

Copper:	Present in 8 samples.	Average 191 ppm.
Lead:	" " 3 "	" 607 "
Zinc:	" " 5 "	" 314 "
Tin:	" " 1 "	" 200 "

Graphite is present in some of the sampled sections, but does not appear to be directly related to the mineralization, and in some cases is present with little or no metal.

The most significant set of samples, (bulked grab samples over 8 ft.) assayed:

Lead 0.16%  
Tin 0.02  
Copper 0.015  
Zinc 0.012  
Considerable Pyrrhotite and Carbon or Graphite are present in this section.

In general, the density of mineralization appears to increase in exposures found at the lower elevations.

GEOCHEMICAL WORK

A total of 18,200 ft. of soil test line was run, using the Dithizone method for field tests supplemented by laboratory assays of check samples. Soil background levels taken over two representative areas at the base of the small root mattress showed low but above average content of Copper and Lead, ( Cu 100 to 150 ppm, and Pb 10 to 70 ppm) with peaks ranging from two to four times background by field test.

While these results were indicative of mineralization, the steep slope of the side-hill, and considerable run-off leads to considerable displacement and mixing of the soils, and the results did not suggest that this method offers a suitable means of detailing.

## GEOPHYSICAL WORK

A total of 19,500 ft. of Self Potential line was run at 50 and 100 ft. stations, with detailing at shorter spacings. Two base lines were established running south to north along the railway and highway rights-of-way from Arbutus Creek to the north boundary of the permit area. These are roughly parallel, cut the strike of the formation at about 90 degrees, and average some 400 ft. apart. Subsequent detailing was then tied in to stations on these lines.

Four anomalous zones are identifiable on both lines, (see attached plan) of which zone B carries the strongest mineralization, and gave the strongest S.P. returns. All four are open to east and west along the strike.

S.P. contrast levels are extremely high, line 26-7 in the B zone showing a drop of 1100 mv. in 530 ft., while variations of several hundred millivolts are found in each anomaly. The presence of graphite appears to be the basic cause of the exaggerated current levels but it is evident from the work to date that the intimate combination of sulphides with carbon is required to produce the more extreme potential differences. In support of this it was found that in a test line run to the south across similar graphitic schist, but with little or no sulphides present, the maximum S.P. contrast was 220 mv., while the same line showed contrast of approx. three times this figure crossing the B anomaly.

An examination was carried out by a consultant familiar with S.P. work. He stated that he had experienced contrast levels of up to 700/800 mv. due to graphite, and agreed that the very high responses appear to be due to the sulphide-graphite combination. He also felt that power line leakage might further exaggerate the currents. The available literature affords no working data on similar conditions.

## PROVISIONAL CONCLUSIONS

The absence of information on the sulphide-graphite effect makes it difficult to evaluate the results so far. It is evident that in each case where strong contrast was encountered the presence of sulphides in appreciable amount is the critical ingredient. It is also noted that the power line leakage theory is doubtful as

contrast increased when the area dried out; and also that a test line run directly under one of the power lines showed no unusual effects other than a high "noise" level, and conformed closely with the parallel lines to the west. Moreover, two electrode stations were within 50 and 30 feet of steel pylon footings, where any appreciable leakage could have been expected to produce rather drastic effects.

The density of mineralization found in the rock exposures in zone B is not sufficient to offer much encouragement on the face of it. However, it has also become apparent in the course of the work that the sulphide content is the critical factor in the stronger S.P. indications. The case of line 26-7 where the potential difference reached 1.1 volts, (also in the B anomaly) closely approaches an efficient carbon-zinc cell voltage, and strongly suggests the presence of Lead/Zinc in much greater density.

In view of the above considerations, and the size of the mineralized area, it is therefore considered that further examination is warranted.



V. H. Patriarche.

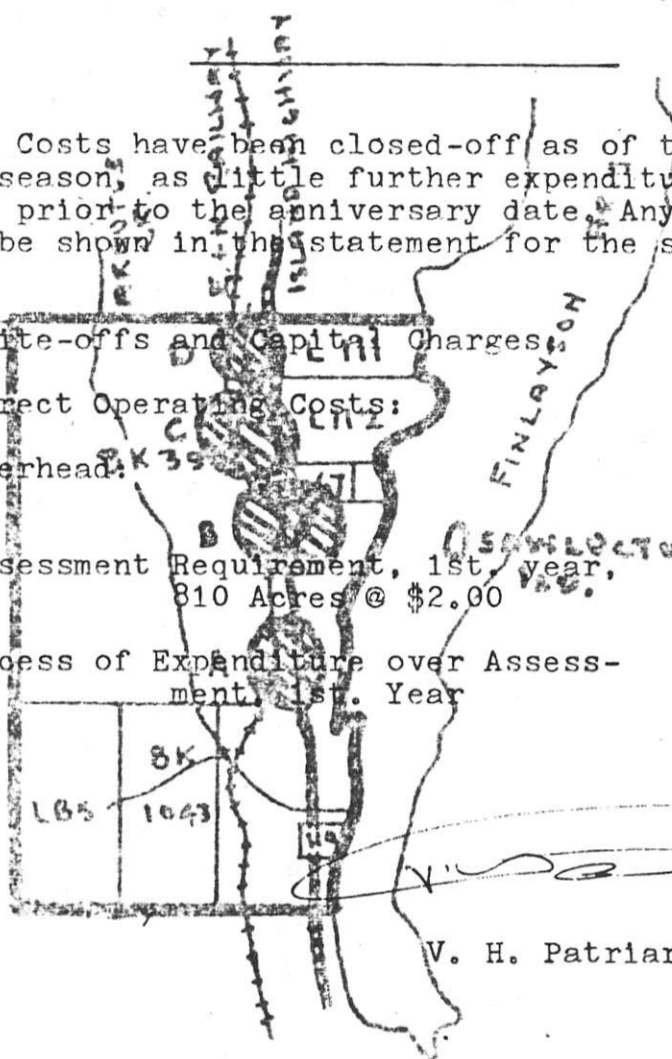


MINING AGREEMENT NO. 17

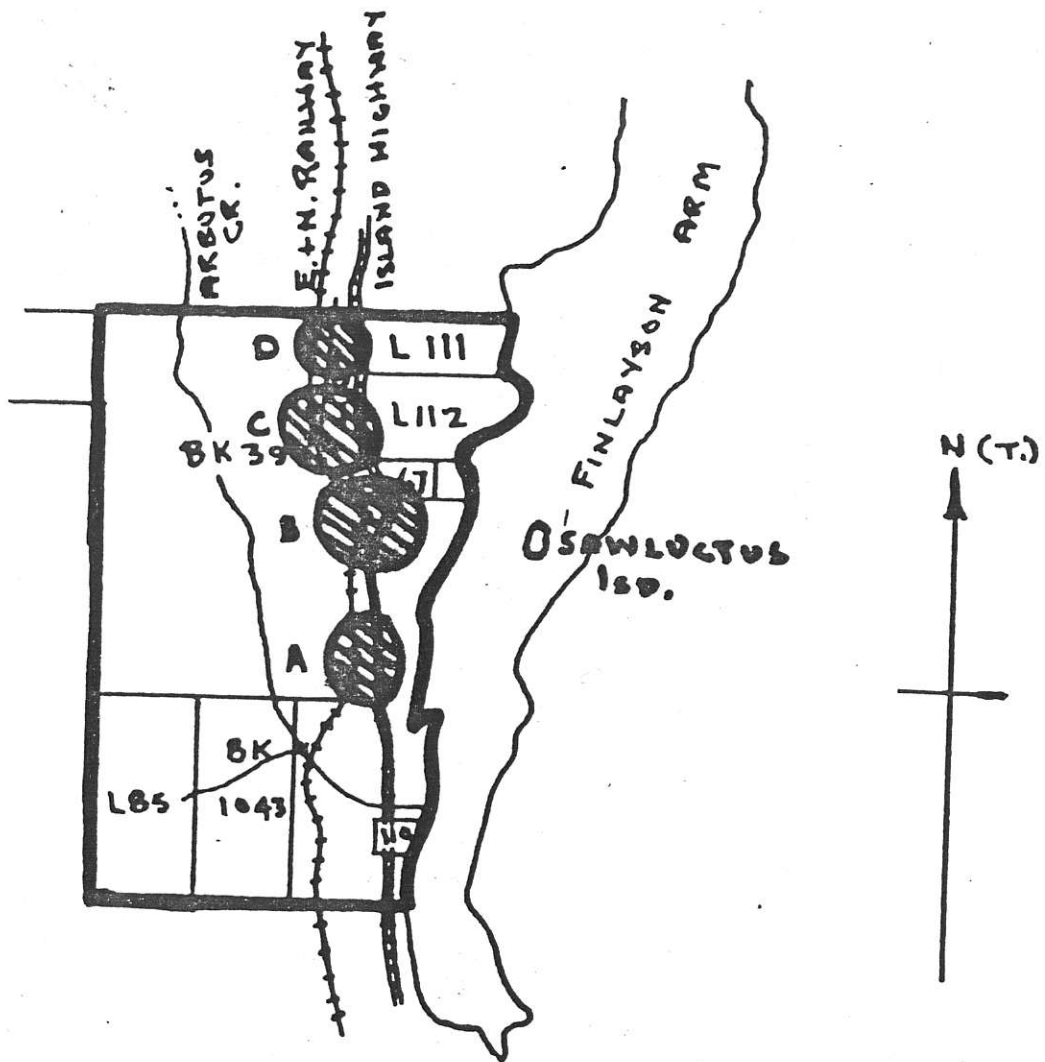
Statement of Exploration Expenditures applicable to the Malahat Permit Area 1 May 66 to 31 Dec 66.

Costs have been closed-off as of the end of the 1966 season, as little further expenditure will be recorded prior to the anniversary date. Any such expenditures will be shown in the statement for the succeeding year.

Write-offs and Capital Charges	\$ 799.31
Direct Operating Costs:	2394.72
Overhead:	268.87
	<u>\$3462.90</u>
Assessment Requirement, 1st year, 810 Acres @ \$2.00	\$1620.00
Excess of Expenditure over Assessment, 1st. Year	\$1842.90:



V. H. Patriarche.



MALAHAT PERMIT  
 AREA,  
 E + N GRANT.  
 SCALE 1 IN. =  $\frac{1}{2}$  MILE.  
ANOMALOUS ZONES SHADED.



Province of British Columbia  
 Ministry of Energy, Mines and Petroleum Resources  
 MINERAL RESOURCES DIVISION—TITLES BRANCH

RECORD OF 2 POST CLAIM — MINERAL ACT

Map No. 92B/5Eh & 12Ea Record No. 1511  
 Mining Receipt No. 215497 E recorded at Victoria B.C. this 22nd day MAY 19 85  
 DO NOT WRITE IN SHADED AREA  
 Dep. [Signature] GOLD COMMISSIONER  
 VICTORIA MINING DIVISION

APPLICATION TO RECORD A 2 POST CLAIM

I. LIONEL JAMES SCOTT (SCOTLJ) RR#2 PAYNE RD.  
 (Name) (Address) DUNCAN B.C.  
 Holder of valid subsisting F.M.C. No. 264078 State that:

On the 18TH day of MAY 19 85 at 10:05 A.M.  
 (Time — indicate A.M. or P.M.)

I completed locating the TUNNEL HILL II 2 post claim in accordance with the regulations.  
 SITUATE AT JUNCTION, NORTH BANK OF ARBUTUS CREEK AND  
 (Here describe the position of the claim relative to known topographical or surveyed features on the map.)  
ESQUIMALT AND NANAIMO RAILROAD VICTORIA M.D.

I have securely fastened to the No. 1 post, metal identification tag no. 392353 M embossed 'Initial Post (No. 1)' upon which the following has been impressed:—

Name of claim TUNNEL HILL II Date of Location MAY 18 1985  
 Locator L. J. SCOTT  
 Compass bearing to No. 2 post DUE NORTH Distance to No. 2 post 457.20 M  
 No. of metres to right -0- to left 457.20 M of location line.

I have securely fastened to the No. 2 post, metal identification tag no. 392353 M embossed 'Final Post (No. 2)' upon which the following has been impressed:—

Name of claim TUNNEL HILL II Date of Location MAY 18 1985  
 Locator L. J. SCOTT

GOLD COMMISSIONER  
 RECEIVED and RECORDED  
 MAY 22 1985  
 M.R. # 215497 E  
 VICTORIA, B.C.  
 RECORDER'S STAMP

[Signature]  
 SIGNATURE

WORK NO.'S OR C/L	DATE RECORDED	MINING RECEIPT	DATE OF EXPIRY	TRANSFERS (BILLS OF SALE, ASSIGNMENTS, CONVEYANCES)

ORIGINAL