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M E R R I T
COALFIELD AND PROPERTY

INFORMATION SUMMARIES
AND REVIEW

OPEN FILE

Prepared

by

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for

IMPERIAL METALS CORPORATION

November, 1983

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M E R R I T T

INFORMATION SUMMARIES AND REVIEW

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x 1 ✓	Merritt in southwestern B.C.: General location map	1:1,000,000
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+	by Crows Nest Resources, 1981	

M E R R I T T
EXECUTIVE SUMMARY

November, 1983

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EXECUTIVE SUMMARY

PAGE ONE

PROPERTY high volatile bituminous thermal coal property,
one freehold lot (506 hectares) and
twenty-three B.C. coal licences (2,185 hectares)
held by Imperial Metals Corporation (100%).

LOCATION Southeastern British Columbia:
N1S 92-1/2
Latitude 50°05'N, Longitude 121°45'W;

TOWN Merritt, one kilometre;

HIGHWAY No. 5 at Merritt to Vancouver (363 km)
Construction of a new highway to Hope commenced,
which will decrease the distance to Vancouver by 90 kilometres.

RAILWAY at Merritt

COAL PORTS Vancouver area, 360 kilometres by rail

TECHNICAL INFORMATION on Page Two

GEOLOGY

Coal occurs in the Tertiary (Eocene) Coldwater Formation in a 100 kilometres long 30 kilometres wide area at Merritt mainly on the south side of the Nicola River. Strata are folded and faulted but the fault blocks are usually large and dips are low to moderate. Coal seam and clean coal thicknesses vary in a wide range increasing in a westerly direction from Normendale, Diamondvale through Coldwater Hill to Coal Gully Hill. In the latter area up to 24 metres of coal occurs in seven seams (two of them exceeding 7 metres) in a 260 metre stratigraphic interval.

PREVIOUS PRODUCTION

2.6 million tonnes in underground mines (1906-1963);

EXPLORATION

at reconnaissance level outside of previous operations;

Shell Canada Resources and its subsidiary Crows Nest Resources operated the property from 1978 to 1982 under an option agreement with Imperial Metals. In this period 24 holes were drilled, a few in each prospective area but most on the north end of Coal Gully Hill. Total exploration expenditures amounted to \$600,000.

Close space drilling is needed to prove surface mineable reserves and feasibility on Coal Gully Hill.

COAL RESERVES

Surface mining potential exists on Coal Gully Hill only: 11.4 million tonnes of geological in-place reserves at an overburden ratio of 7:1 m³ waste per tonne of coal 6.6 million tonnes of additional open pit mining potential;

additional coal resources amenable to underground mining over 120 million tonnes geological in-place in the Coal Gully Hill, Coldwater Hill and Diamondvale areas;

PRODUCTION POTENTIAL

half to one million tonne clean coal annually;

POTENTIAL PRODUCT

high volatile B bituminous (ASTM) coal

<u>Targeted Uses:</u>		<u>t h e r m a l</u>	<u>metallurgical</u>
Coal quality:		electric power generation cement manufacturing	blend, or substitute
Inherent Moisture	%	3.0	2.7
Ash	%	15.0	9.5
Volatile Matter	%	35.0	37.4
Fixed Carbon	%	47.0	50.4
Heat Value	Kcal/kg	6,870	7,200
	Btu/lb	12,300	13,000
Sulphur	%	0.7	0.7
Free Swelling	Index		1- 5
Max. Fluidity	dl/m		420-450

MARKETS

exports overseas for targeted uses

M E R R I T T

RECOMMENDATIONS

1. B.C. Coal Licences 6216, 6217, 6220, 6221, 6222, 6223, 6226, 6227, 6228, 6229, 6230, 6234, 6235, 6236, 6237, 6238, 6240, 6241, 6242 covering 1,741 acres be not renewed.
2. The property should be actively marketed for participation. It has some economic open pit mining potential. If this is proved, the property would be attractive for development due to its desirable coal quality and location.
3. All further work concentrate on surface mineable reserves and potential in the Coal Gully Hill area.
4. All available information from previous exploration and mining from the Coal Gully Hill including the Crows Nest Pit area be compiled and evaluated in detail.
5. Subsequent to above a small approximately five shallow hole drilling program be carried out to confirm or disprove the potential Prospect Pit.
6. Subsequent to and as warranted by encouraging results from works recommended above the Crows Nest Pit, Prospect Pit and additional potential areas be drilled to prove all feasible open pit mineable reserves.

M E R R I T T
TECHNICAL SUMMARY

November, 1983

M E R R I T T

1. EXECUTIVE SUMMARY

PAGE ONE

PROPERTY

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TOWN

Merritt, one kilometre;

HIGHWAY

No. 5 at Merritt to Vancouver (363 km)
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which will decrease the distance to Vancouver by 90 kilometres.

RAILWAY

at Merritt

COAL PORTS

Vancouver area, 360 kilometres by rail

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additional coal resources amenable to underground mining over 120 million tonnes geological in-place in the Coal Gully Hill, Coldwater Hill and Diamondvale areas;

PRODUCTION POTENTIAL

half to one million tonne clean coal annually;

POTENTIAL PRODUCT

high volatile B bituminous (ASIM) coal

Targeted Uses:

Coal quality:		<u>t h e r m a l</u>		<u>metallurgical</u>
		electric power generation	cement manufacturing	blend, or substitute
Inherent Moisture	%	3.0		2.7
Ash	%	15.0		9.5
Volatile Matter	%	35.0		37.4
Fixed Carbon	%	47.0		50.4
Heat Value	Kcal/kg	6,870		7,200
	Btu/lb	12,300		13,000
Sulphur	%	0.7		0.7
Free Swelling	Index			1- 5
Max. Fluidity	cd/m			420-450

MARKETS

exports overseas for targeted uses

M E R R I T T

2. LAND TENURE SUMMARY

LAND DISTRICT YALE, KAMLOOPS DIVISION, B.C.
 YEAR OF ACQUISITION 1980 (B.C. Coal Licences)
 ANNIVERSARY DATE May 21, uniform for all B.C. Coal Licences
 RENTAL \$ 5.00/hectare per term (licence year)
 WORK REQUIREMENTS \$25.00/hectare for the 1983-1984 term
 \$25.00/hectare for the 1984-1985 term
 \$50.00/hectare for the 1985-1986 term
 \$50.00/hectare for the 1986-1987 term and thereafter

PER B.C.C.L.	LEGAL description	AREA hectares	WORK REQUIS. FULFILLED 'till term incl.	EXCESS WORK CREDIT \$/hectare
RESERVE AREAS				
	Freehold	Lot 166	506	N/A
6 2 3 1		Ptn of Lot 172	17	1985-1986
6 2 3 2		SW1/4 of Sec.16, Twp.91	39	"
6 2 3 3		E1/2 of Lot 1227	130	"
6 2 3 9		Sec.14, Twp.91	253	"
	Reserve areas, total	945	1985-1986	40.12
PROSPECT AREAS				
6 2 1 6		Lot 3254	130	1985-1986
6 2 1 7		SW1/4 of Sec.4, Twp.91	65	"
6 2 2 0		Ptn of Sec.11, Twp.91	130	"
6 2 2 1		Lot 3638	45	"
6 2 2 2		Lot 3639	47	"
6 2 2 3		Lot 1219	33	"
6 2 2 6		Lot 186	33	"
6 2 2 7		Lot 1304	261	"
6 2 2 8		Lot 1148	33	"
6 2 2 9		Lot 1305	262	1985-1986
6 2 3 0		Lot 1918	6	1982-1983
6 2 3 4		NE1/4 of Sec.5, Twp.91	65	1985-1986
6 2 3 5		N1/2 of Sec.3, Twp.91	130	"
6 2 3 6		SE1/4 of Sec.10, Twp.91	65	"
6 2 3 7		Lot 167	47	"
6 2 3 8		Lot 122	125	"
6 2 4 0		Sec.14, Twp.91	130	"
6 2 4 1		Ptn of Sec.23, Twp.91	21	"
6 2 4 2		Ptn of Sec.24, Twp.91	118	1985-1986
	Prospect Areas, Total	1,741		
MERRITT PROPERTY				
	freehold	506		
	23 B.C. Coal Licences	2,185		
	TOTAL	2,691		

M E R R I T T

3. SUMMARY OF WORK DONE
EXPLORATION AND MINING

The objective of this summary is to assist further evaluation in finding original records and reports of exploration, mining and evaluation. It was not intended to be a comprehensive historic review or bibliography. Imperial Metals has a very good collection of reports concerning the Merritt Coalfield. Its index is a fairly complete bibliography.

The Geological Survey of Canada reported coal in the Merritt area in 1877-1878. The outcrops along the Coldwater River were mined and at least three holes were drilled between 1892 and 1904. Regular commercial production began in 1906 when railroad connection to the main Trans-Canada line was completed. By 1963, when the last mine closed, approximately 2.6 million tonnes of coal was produced almost all in underground mines.

Almost 80% of the production came from the Coal Gully Hill. All seven seams were mined to a various extent. Seam numbers, 1,5,4,8,6,3,2 in an ascending order, reflect the sequence of production commencement. There were seven relatively larger and a number of small mines in this area. Middlesboro Collieries were the main producer from 1906 to 1944, which company also operated two mines on Coldwater Hill. Mining continued in the latter area after 1945 on a small scale by Mr. Samuel Gerrard from whom Imperial Metals acquired the freehold Lot 166. Coal Hill syndicate operated west of this lot on the west side of Coal Gully Hill.

Pacific Coast Coal Company and Diamondvale Coal and Iron Company sank a shaft on the west and south sides of Coal Gully Hill respectively, which produced no coal. The latter company later developed two small mines east of Merritt. Some 50,000 tonnes production came from this area named after the company. Even smaller were the Normandale (one) and Sunshine (two) mines in the southeastern corner of the coalfield and north of the Nicola River, respectively.

Coal is burning underground on Coldwater Hill and hot steam is coming from some shafts on Coal Gully Hill. However, coal exposed by old mining operations stood well at many other localities. All old portals which could be found were bulldozed in by Crows Nest Resources Limited in 1979 at the request of the District Mining Inspector.

There are incomplete but voluminous records of drilling associated with previous mining activities. Imperial Metals has a good collection of the old mining plans which are also available from the Mining Branch of the B.C. Ministry of Energy, Mines and Petroleum Resources in Victoria. Shell Canada Resources and its subsidiary Crows Nest Resources, the operator of the property between 1978 and 1982, attempted to incorporate the old records into their geological interpretation. Further, such work is advisable concerning the surface mineable areas on Coal Gully Hill where detailed geological analysis is necessary.

There are only a few old drill holes outside of the areas of previous operations. They proved the continuity of the coal measures between the Coal Gully and Coldwater Hills (although the upper seams are eroded) and further on the east side of the Coldwater River. The most significant of such drilling was done in 1946. It was sponsored by the B.C. Department of Mines to rejuvenate coal mining at Merritt. Eleven holes were drilled mostly east of the Diamondvale mines but little economically mineable coal was found. This work is well documented in the 1946 Report of the B.C. Minister of Mines.

In 1960, Imperial Metals had 1157 metres drilled in 16 rotary holes on the Coal Gully and Coldwater Hills. Two of these holes were later deepened by diamond drilling. In 1968 and 1969 Sumicol Consultants of Japan had 821 metres cored in four holes in the same area. They also evaluated the property and recommended underground mining for which they indicated 35 million tonne reserves on the Coldwater Hill. Imperial Metals has reports of these works.

Shell Canada Resources had title to the coal on the property between 1978 and 1982 under an option agreement with Imperial Metals. Shell's wholly owned subsidiary, Crows Nest Resources, operated the property and carried out extensive exploration. Reasonably detailed geological mapping was done and the coal occurrences were trenched usually by a bulldozer. A good location survey was also carried including all coal occurrences, drill holes and mine portals which could be found. Both

reflection and refraction seismic, as well as resistivity, surveys were carried out on the Coal Gully and Coldwater Hills on an experimental basis with questionable results. In 1978 and 1979, a total of 3,877 metres were drilled in twenty rotary holes. On the Coal Gully and Coldwater Hills were all but one hole drilled. Most of them were spudded on the southern end of Coal Gully Hill and on the flat foreground where a small potential pit was delineated containing 5.1 million tonnes of geological in-place coal reserves. In 1980 a total of 663 metres were drilled in three holes in the Normandale area which did not intersect any coal seam of mining potential.

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4. COAL RESERVES SUMMARY

GEOLOGICAL IN PLACE RESERVES, MILLION TONNES

SURFACE MINEABLE:	INDICATED	5.1
	INFERRED	6.3
	<u>TOTAL RESERVES</u>	<u>11.4</u>

ADDITIONAL POTENTIAL	6.6
<u>TOTAL POTENTIAL</u>	<u>18</u>

UNDERGROUND MINABLE	INDICATED	40
	INFERRED	80
	<u>TOTAL RESERVES</u>	<u>120</u>

ADDITIONAL POTENTIAL has not been estimated

SURFACE MINEABLE
RESERVES

<u>SECTION</u>	<u>WASTE</u>	<u>COAL</u>	<u>OVERBURDEN RATIO</u>
m	m ³	t	m ³ waste/t coal

INDICATED RESERVES (COAL GULLY HILL, CROWS NEST PIT)

000	9,280,740	900,765	10.30:1
150S	9,209,749	1,047,901	7.83:1
300S	7,095,750	602,059	11.12:1
450S	6,455,700	825,781	7.15:1
600S	5,304,300	861,052	5.49:1
750S	7,875,000	874,890	8.33:1
<u>TOTAL</u>	<u>42,520,350</u>	<u>5,112,450</u>	<u>8.23:1</u>

INFERRED RESERVES (COAL GULLY HILL, PROSPECT PIT)

000	3,172,500	911,250	3.48:1
150S	5,128,500	1,284,750	3.99:1
300S	13,444,500	1,962,000	6.85:1
450S	16,000,000	2,155,500	7.42:1
<u>TOTAL</u>	<u>37,265,850</u>	<u>6,313,500</u>	<u>5.98:1</u>

INDICATED & INFERRED RESERVES COMBINED

<u>80,265,850</u>	<u>11,425,950</u>	<u>7.02:1</u>
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M E R R I T T

5. COAL GULLY HILL SURFACE MINEABLE RESERVES BY SECTION

COAL AND WASTE VOLUMES

<u>SECTION</u> No.	<u>WIDTH</u> m	<u>PIT AREA</u> m ²	<u>PIT VOLUME</u> m ³	<u>COAL VOLUME</u> m ³	<u>WASTE VOLUME</u> m ³	<u>COAL TONNAGE</u> t	<u>OVERBURDEN</u> <u>RATIO</u> m ³ rocks/t coal	
<u>CROWS NEST PIT - INDICATED RESERVES (CROWS NEST RESOURCES, 1981)</u>								
000	150				9,280,740	900,765	10.30:1	
150S	150				8,209,749	1,047,901	7.83:1	
300S	150				7,095,750	602,059	11.12:1	
450S	150				6,455,700	825,781	7.15:1	
600S	150				5,304,300	861,052	5.49:1	
750S	150				7,875,000	874,890	8.33:1	
TOTAL	900				42,520,350	5,112,450	8.23:1	
<u>PROSPECT PIT - INFERRED RESERVES</u>								
000	150	25,200	3,780,000	607,500	3,172,500	911,250	3.48:1	
150S	150	39,900	5,985,000	856,500	5,128,500	1,284,750	3.99:1	
300S	150	98,350	14,752,500	1,308,000	13,444,500	1,962,000	6.85:1	
450S	150	116,300	17,445,000	1,437,000	16,000,000	2,155,500	7.42:1	
TOTAL	600	279,750	41,962,500	4,209,000	37,265,500	6,313,500	5.98:1	
<u>COAL GULLY HILL SURFACE MINEABLE RESERVES - TOTAL</u>						79,785,850	11,425,950	6.98:1

PROSPECT PIT - COAL TONNAGES IN DETAIL

<u>SECTION</u> No.	<u>WIDTH</u> m	<u>THICKNESS</u> m (av.)	<u>LENGTH</u> m	<u>COAL VOLUME</u> m ³	<u>BULK DENSITY</u> t/m ³	<u>COAL TONNAGE</u> t	<u>COMMENTS</u> SEAM NO.
000	150	4.0	140	84,000	1.5	126,000	#4
	150	3.0	280	126,000	1.5	189,000	#5
	150	5.0	530	397,500	1.5	596,000	#1
TOTAL	150			607,500	1.5	911,250	
150S	150	4.0	190	114,000	1.5	171,000	#4
	150	3.0	600	270,000	1.5	405,000	#5
	150	5.0	630	472,000	1.5	708,000	#1
TOTAL	150			856,500	1.5	1,284,000	
300S	150	1.5	100	22,500	1.5	33,750	#2
		0.8					#3 as waste
	150	1.5	200	45,000	1.5	67,500	#6
	150	2.0	480	144,000	1.5	216,000	#8
	150	4.0	350	210,000	1.5	315,000	#4 as waste old workings
	150	3.0	720	324,000	1.5	485,000	#5
	150	5.0	750	562,500	1.5	843,000	#1
TOTAL	150			1,308,000	1.5	1,962,000	
450S	150	1.5	190	42,750	1.5	64,125	#2
		0.8					#3 as waste
	150	1.5	550	123,750	1.5	185,625	#6
	150	2.0	620	186,000	1.5	279,000	#8
	150	4.0	330	198,000	1.5	297,000	#4 as waste old workings
	150	3.0	720	324,000	1.5	486,000	#5
150	5.0	750	562,500	1.5	843,000	#1	

M E R R I T T

6. COAL QUALITY SUMMARY

RANK (ASTM) high volatile "B" bituminous

TARGETED USES	Thermal electric power generation cement manufacturing	Metallurgical blend, or substitute
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POTENTIAL
SPECIFICATIONS

Proximate Analysis

Inherent Moisture	% adb	3.0	2.7
Ash	% adb	15.0	9.5
Volatile Matter	% adb	35.0	37.4
Fixed Carbon	% adb	47.0	50.4
Capacity Moisture	%	8 - 9	8 - 9
Sulphur	% adb	0.7	0.7
Heat Value	Kcal/kg adb	6,830	7,200
	Btu/lb adb	12,300	13,000
Hardgrove Grindability	Index	55-60	55-60
Ash Softening Temp.	°C	1,550	1,550
Free Swelling	Index		1 - 5
Max. Fluidity	ddl/m		3-500
	°C		420-450

M E R R I T T

7. REVIEW

OBJECTIVES AND NATURE OF THIS STUDY

Coal exploration and mining has taken place on the Merritt Coalfield since 1877 intermittently. A substantial volume of geological information has accumulated, although the coalfield is still not well explored. The objectives of this study were:

- to organize information available and to present summaries of data pertinent to further management, exploration and development of the property;
- to indicate short to middle term development potential and further work or other actions necessary.

Detailed compilation and evaluation of data, the property or the short to middle term prospective areas was not required in this stage beyond a minimum necessary to indicate potential or the lack of it. As various summaries, including an overall executive summary, are presented, this review concentrates on the reasons and recites data only to the extent which is necessary for meaningful discussion.

THE MERRITT COALFIELD

The Merritt Coalfield is a late, continental stage local intermontane sedimentary basin in the Western Cordillera. If developed in a part of a downfaulted graben system along which igneous activities were common throughout the Tertiary time. Coal occurs in the Tertiary (Eocene) Coldwater Formation, which is underlain and, unless eroded, overlain by igneous rocks. The time of coal deposition coincided with (the Laramide) very intensive orogenic activity causing unstable depositional environments. Coal seams in such environments may reach extraordinary thicknesses, but exhibit extreme variations over short distances. The coal seams tend to split, merge and exclude lots of partings. Intense faulting of such basins is also common. On the other hand coal rank is often higher in such basins than expected from the age and stratigraphic overburden. All these are applicable to the Merritt Coalfield. While these conditions are negative for coal development generally, they can be very favourable in a small area. Recognition of such favourable small areas, lots of drilling, meticulously detailed small-scale work and persistence are essential to successful exploration and development on the Merritt Coalfield.

The number and the thickness of coal seams, as well as the thickness of all sediments, decreases in an alluvial fan depositional environment toward the main drainage as follows:

MERRITT-REVIEW

	Coal Gully Hill	Coldwater Hill
Thickness of sediments (m)	260	140
Number of coal seams	7	6
Thickness of coal seams (m)	1-9	1-2
Aggregate coal (m)	24	7

A further decrease in coal is indicated by sparse data in the Normandale area. There are also only few and thin coal seams in the Sunshine area north of the Nicola River which area is a residential subdivision of Merritt.

The coal-bearing strata had been folded into two major plunging synclines and were subsequently faulted. The synclines are relatively large. Dips are at low angles in the center and moderate on the limbs. The tighter western syncline is at Gully Hill. Coldwater Hill is the western, Diamondva is the eastern limb of the broader syncline.

Only on the Coal Gully Hill occur large volumes of coal thick enough cover to consider surface mining. Most of it was mined in the past by underground methods, but the remaining reserves are significant. The rest of geological in-place coal reserves are on Coal Gully and Coldwater Hills and in the Diamondva area but amenable to underground mining only.

THE PROPERTY

Imperial Metals Corporation holds the coal right on all lands prospective for coal in the Merritt Coalfield including one freehold lot (No. 166) and twenty-three B.C. Coal Licences. Some licences could be dropped as recommended, without any loss in coal reserves or potential, open pit or underground.

LOCATION AND INFRASTRUCTURE

The location of the Merritt property is one of its main advantages. It is located along existing railway 400 kilometres from the Vancouver area coal ports. All Western Canadian coal, presently exported, comes from mines more than 1000 kilometres away from ports. All other elements of infrastructure also exist. The area has a pleasant climate for operation and manpower and a long tradition in mining.

COAL DEVELOPMENT POTENTIAL AND RESERVES

Underground development without open pit operations cannot be considered for the short and middle term. All efforts should be concentrated on proving and developing surface mineable reserves. These are estimated to be 11.4 million tonnes geological in-place with an additional potential for 6.6 million tonnes. All these open pit mineable reserves and potential are located on Coal Gully Hill.

Crows Nest Pit

Crows Nest Resources, a wholly owned subsidiary of Shell Canada Resources, optioned the property from 1978 to 1982. A pit was tentatively delineated in this period in the northern foreground (toward Merritt) of Coal Gully Hill for which 5.1 million tonnes geological in-place indicated reserves were estimated at a corresponding overburden ratio of 8.23:1 m³ waste per tonne of coal. There seems to be more coal than the stated volume within the present perimeter of this pit and it appears to be possible to extend the pit toward both the hill and the foreground. These expected coal tonnage increases are included in this study as additional potential. Details of Crows Nest's calculations were not available and without those or similarly detailed new reserve calculations Crows Nest's figures could not be responsibly changed.

Prospect Pit

Potential for an additional pit has been recognized during this study further up on Coal Gully Hill, westward from the Crows Nest pit. It is expected to include 6.3 million geological in-place tonnes of coal at a corresponding overburden ratio of 5.98:1 m³ waste per tonne of coal. As there is no drill hole on this potential pit area, these reserves are placed into the inferred category. Geological projections were made from old workings and surface exposures.

Additional Potential

More coal in and a possible extension of the Crows Nest Pit has already been mentioned. Small possible pits on the upper seams only, areas of old workings and some other possibilities were also excluded. These are estimated to amount to an additional potential of 6.6 million tonnes.

PREVIOUS PRODUCTION

2.6 million tonnes were produced from underground mines between 1906 and 1963 mostly from the Coal Gully Hill area. Records of previous mining provide a vast amount of information not fully utilized to date.

EXPLORATION: WORK DONE AND FURTHER WORK NECESSARY

In the Coal Gully Hill area previous mining, associated exploration and Crows Nest's exploration constitutes most of work done. Further work should concentrate on Coal Gully Hill to find and prove surface mineable reserves.

First a detailed and meticulous compilation of all available information is recommended including the Crows Nest Pit area. It will provide a better understanding of the local Geology in the Coal Gully Hill area, will likely improve the reserve potential and will provide a good basis for targeting drill holes efficiently.

Old mining records require a particular attention. They show the geological structure very well. Significant tonnages are left in the thicker seams, as some of them exceed seven metres and only a maximum of two metres thicknesses were mined in the past. On the other hand the state of the remaining coal is not known and old workings cause difficulties for open pit mining. In the areas of old workings in a potential pit, in Carbonia's calculation, the entire coal seam was added to the rock volumes.

Drilling will be needed to prove the Prospect Pit, additional potential, the possible extension of the Crows Nest pit and to fill some serious information gaps within it. Drilling five shallow holes totalling approximately 1000 metres at a cost of \$100,000 would confirm or disprove the potential of the Prospect Pit without which open pit mining is doubtful. If this program is successful, further infill drilling would follow in the areas of both Crows Nest and Prospect pits and of other additional potential.

COAL QUALITY

The quality of Merritt coal is one of its main advantages. It is high volatile B bituminous by ASTM standards, and if sufficiently clean, it is preferred as thermal coal in electrical power generation and cement manufacturing. It is not a coking coal by itself but has some coking potential and could be useful in a blend with medium volatile (lower range) coals.

MARKETS AND ECONOMY

Merritt coal would command \$55-\$60 per tonne f.o.b. Vancouver in terms of 1983 Canadian dollars even under the presently depressed market conditions. Its transportation to the port and port costs would probably cost not more than \$12 per tonne. If the m³ waste per tonne of clean coal can be kept below 10:1, it would cost (operating now) approximately \$40 per tonne clean coal to produce by surface mining. Accordingly, if sufficient such tonnages are proven, the deposit is instantly competitive for development. Besides the importers, some of the Western Canadian exporters would be interested to participate in development as truly thermal (not metallurgical, oxidized or un-oxidized) coal is in short supply in the Rocky Mountains.

There may be some concern, that with a million tonne annual output, reserves would be depleted too soon considering the capital investment. If Merritt is developed in conjunction with Tulameen (also exportable high volatile bituminous coal and also owned by Imperial Metals) a ten year mine life at each and transferring equipment from one to the other could alleviate this problem.

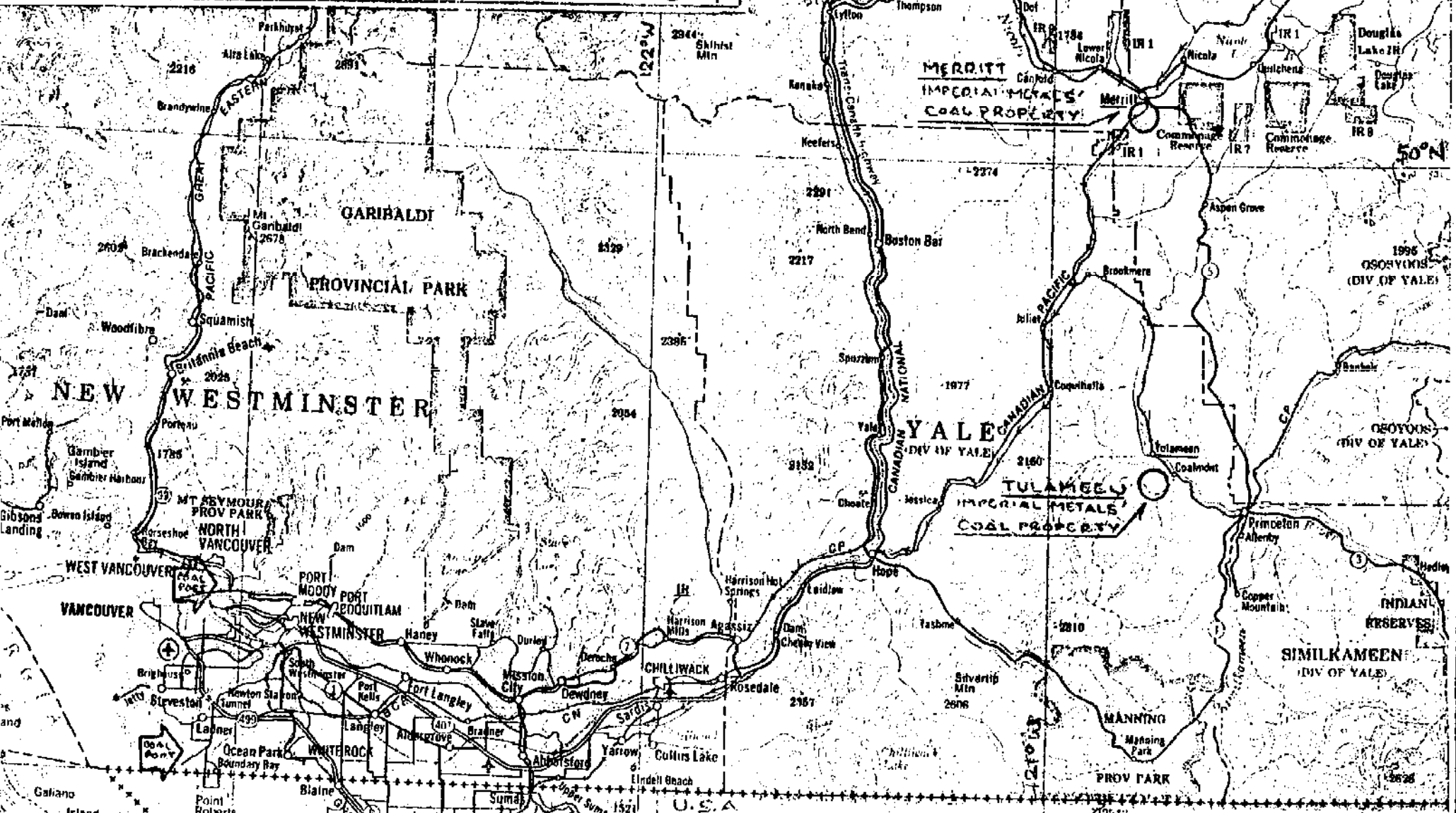
MERRITT

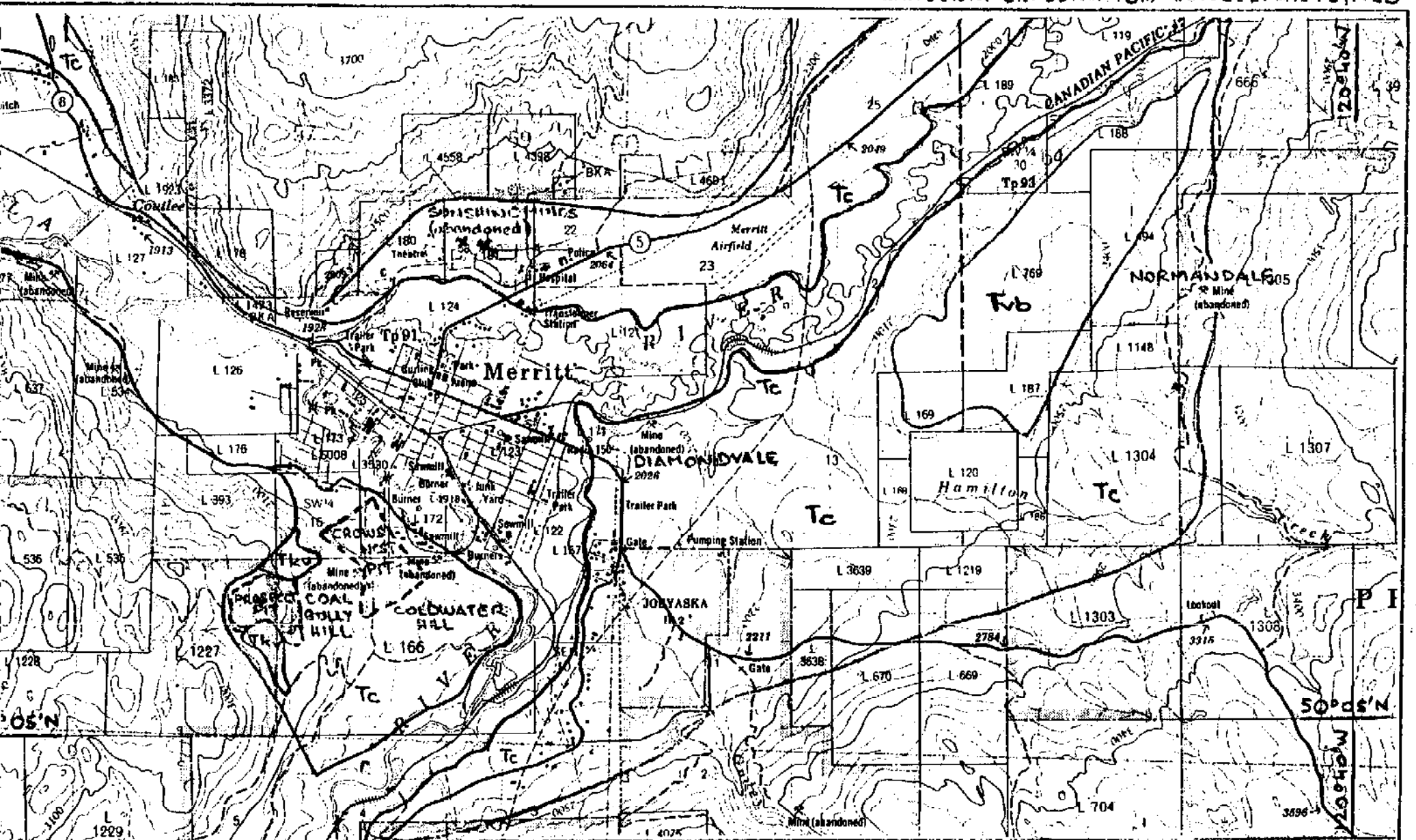
IN SOUTHWESTERN BRITISH COLUMBIA

GENERAL LOCATION MAP

SCALE 1:1 000 000

ENCLOSURE 1





- Tvb Valley Escarpment (Tertiary)
- Tkv Kamloops volcanics (Tertiary)
- Tc Coldwater Formation (Tertiary)
- [Stippled Box] coal measures potential open pit
- Tn Nicola volcanics (Triassic)

**MERRITT COALFIELD
GENERAL GEOLOGY**

SCALE 1:50 000

+ X-SECTION PIT VOL (BCM)

SECTION 00 $0.135 \frac{\text{mm}^2}{100 \text{mm}^2} \times \frac{1 \text{cm}^2}{1 \text{cm}^2} \times \frac{200 \text{m}^2}{1 \text{cm}^2} =$
 $11.35 \text{ cm}^2 \times 400 \text{ m}^2 = 4540 \text{ m}^2 \times 45.72 \text{ m}$
 $= 207,568.8 \text{ m}^3$

$1 \text{ cm} = 100 \text{ mm}$
 $1 \text{ cm} = 20 \text{ m}$
 $\therefore 1 \text{ cm}^2 = 400 \text{ m}^2$

$\therefore \frac{1 \text{ mm}^2}{100 \text{ mm}^2} \times \frac{1 \text{cm}^2}{1 \text{cm}^2} \times \frac{400 \text{m}^2}{1 \text{cm}^2} \times 45.72 \text{ m} =$

$\times 150'$

00

$= 207,568.8 \text{ m}^3$

SECTION 150 $1058 \text{ mm}^2 \times 4 \times 45.72 \text{ m} = 193487.04 \text{ m}^3$

SECTION 300 $1209 \text{ mm}^2 \times 4 \times 45.72 \text{ m} = 221,101.92 \text{ m}^3$

450 $573 \text{ mm}^2 \times 4 \times 45.72 \text{ m} = 104790.24 \text{ m}^3$

600 $702 \times 4 \times 45.72 = 128381.76 \text{ m}^3$

750 $571 \times 4 \times 45.72 = 104424.48 \text{ m}^3$

1×10^6

3×10^4

ADDITIONAL COAL

$$00 \quad 7.6' + 1.6' \times \left(\frac{40.39 \text{ m}}{2} \right) \times 45.72 = 1124.712 \text{ m}^3 \text{ COAL}$$

8.2 m

$$150 \quad \begin{array}{r} 0.6 \text{ m} \times 10.5 \text{ m} \times 45.72 = 288.036 \\ 2.6 \times 6 \times 45.72 = 713.232 \\ 4.2 \times 2 \times 45.72 = 384.048 \\ \hline 1385.316 \end{array}$$

$$300 \quad \begin{array}{r} 1.8 \times 18 \text{ m} \times 45.72 = 1505.256 \\ 2.2 \times 10 \text{ m} \times 45.72 = 1003.04 \\ .8 \times 9 \text{ m} \times 45.72 = 329.184 \\ 3.9 \times 5 \text{ m} \times 45.72 = 891.54 \\ \hline 3589.02 \end{array}$$

$$450 \quad \begin{array}{r} 2.1 \times 2 \text{ m} \times 45.72 = 192.024 \\ 3.1 \times .5 \times 45.72 = 70.866 \\ \hline 262.890 \end{array}$$

$$600 \quad \begin{array}{r} 4.2 \times 4 \text{ m} \times 45.72 = 768.096 \\ 9.2 \times 12 \text{ m} \times 45.72 = 5047.488 \\ \hline 5815.584 \end{array}$$

$$750 \quad \begin{array}{r} 6.0 \times 5.0 \times 45.72 = 1371.600 \\ 2.9 \times 3.0 \text{ m} \times 45.72 = 397.764 \\ \hline 1769.364 \end{array}$$

	CNR GEO. IN PLACE COAL (M ³)	COAL ADD DUE TO HIGHWALL CHANGE	SPECULATIVE TONN CHANGES	NEW VOL	NEW TON.	P.V.T	WASTE NEW	RATIO
00	600,510	1124.712	601635	601635 601635	902452.5	91008819	9487184	10.51:1
150	698,601	1385.316	4.0x 110x 45.72 + 20,116.8	720103	1,080,54.5	9101837	8381734	7.85:1
300	401,373	3589.02	3.4x 160x 45.72 = 24871 4.0x 70x 45.72 = 12801.6	442634	663951	7316852	6874218	10.35:1
450	550,521	262.890		550784	826176	6560490	6009106	7.27:1
600	574,035	5815.584		579850	869775	5432682	4852832	5.58:1
750	583,260	1769.364	-4.5x 43x 45.72 - 8846.82	576182	864273	79792424	7403242	8.56:1
					5206781			8.23:1 8.76