



Crew Natural Resources Ltd.

Developing Copper-Gold Projects In British Columbia
(VSE - CWT)

THE RED DOG PROJECT Vancouver Island

"Crew Natural

Resources

Limited is in

the enviable

position of

having at

least three

highly

prospective

properties . . ."

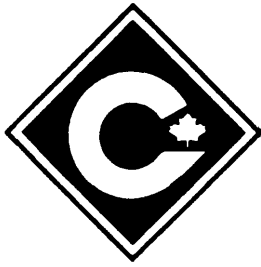
David Williamson
October, 1990



- ◆ Estimated geologic reserve exceeding 100 MT in three prospective zones, including Red Dog Hill
- ◆ Proven reserves for Red Dog Hill zone calculated at over 45 MT containing 23.3 M lb. Cu; 453,000 oz Au, 5.43 M lb. Mo
- ◆ Estimated stripping ratio 0.36 : 1
- ◆ 100% working interest in Project. To date, over 70 diamond drill holes completed on the property
- ◆ Located near Island Copper Mine; close to tide water, main road and high voltage electrical power



View west from Island Copper Mine to the Red Dog project area.



Crew Natural Resources Ltd.

“Crew’s major project is the “Red Dog” copper/gold deposit on Vancouver Island which is in close proximity to BHP-Utah’s major Island Copper mine. Island Copper has a short mine life and, in the immediate future, may suffer a downturn in production as the pit wall is stripped back to expose additional reserves. Crew is presented with a range of choices for the development of Red Dog. The property can either be drilled

out fully and, dependent upon its ultimate size, could be developed on a stand-alone basis. On the other hand, it could be operated as a quarry supplying crushed ore to Island Copper on a toll basis.”

Excerpted from a report on Crew Natural Resources dated October, 1990 by David Williamson Associates Limited, noted mining analysts and publishers of International Mining Review.

“Main asset is

the Red Dog

copper/gold

deposit. Total

mineral

resources 47.7m

tonnes at 0.3%

Cu. 0.45g/t Au.

Potential for

100m + tonnes

deposit.

David Williamson
October, 1990

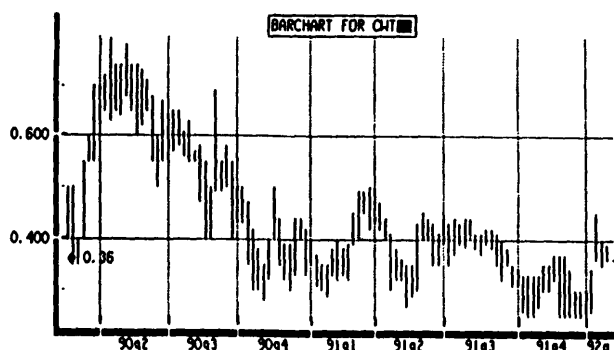
Red Dog Hill Zone : Significant Drilling Results				
Hole No.	Interval ft	Length ft	Copper %	Gold oz/t
77-023	2-122	120	0.38	no assay
77-024	12-180	168	0.20	no assay
EC-133	90-510	420	0.30	0.012
EC-134/135	4-104	100	0.45	0.020
EC-141	71-386	315	0.16	0.010
EC-142	240-310	70	0.20	0.011
EC-143	20-146	126	0.56	0.035
88-1A	10-490	480	0.44	0.014
88-2	15-350	335	0.43	0.013
88-3	15-160	145	0.17	0.009
88-4	12-322	310	0.24	0.008
90-2	12-433	421	0.18	0.006
90-3	10-679	669	0.36	0.017
90-4	12-413	401	0.31	0.013
90-5	39-167	128	0.23	0.010
90-6	20-58	31	0.32	0.010
90-7	39-344	305	0.21	0.010
90-8	138-226	88	0.18	0.007
90-9	12-325	313	0.29	0.013
90-10	18-301	283	0.32	0.017
91-2	10-276	266	–	0.013
91-3	4-226	222	0.34	0.015
91-4	60-183	123	0.21	0.007
91-5	6-282	276	0.42	0.020
91-6	22-315	293	0.58	0.023
91-7	36-487	451	0.30	0.013
91-8	24-525	501	0.50	0.016

Note: i) Hole 90-6 entered a post-mineral dyke at 58 ft.
 ii) Hole 91-2 angled sub-parallel to topo – copper leached
 iii) Drill hole spacing 300 ft. and less.



Crew Natural Resources

Sector: Junior Minerals Explorer
Listed: Vancouver
Code: CWT
Price: C\$0.38
Shares Issued: 9,838,815
Market Cap: C\$3.74m
Warrants Issued: 2,075,000
Float: 25% approx
Long term Debt: Nil
Cash: Nominal
12 month range: C\$0.25-0.50
Av monthly volume: 620,000
Major Shareholder: Crew Group & Associates (40%)



Major Potential Can Now Be Realised

Now that Crew has unencumbered control over its Red Dog Hill copper/gold deposit on Vancouver Island it is free to negotiate with the management of BHP Copper to supply ore to their nearby Island Copper complex. We calculate that if Crew receive 50% of the profits generated from such an ore supply contract then, from early 1993, their annual earnings would amount to about 80¢/share and the net present value (discounted at 10%) of the immediately envisioned cash flow would be about \$22.m, some 225¢/share. The Company is now seeking to raise about CDN\$350,000 for a modest work programme. *We continue to recommend Crew as a company with excellent growth prospects.*

- Crew has now regained 100% control of their Red Dog project and is negotiating with BHP Copper to deliver ore to their Island Copper mine.
- 25 million tons of copper/gold ore can be supplied to Island Copper.
- Profits per ton, inclusive of smelter costs, should be about CDN\$3.34, totalling over \$80m.
- If divided 50:50 between Island Copper and Crew, earnings would be 80¢/share and the net present value (10% discount) over \$22m, some 225¢/share.
- Crew is now seeking to raise CDN \$350,000 to undertake a little additional drilling, environmental permitting work and metallurgical testing of their ore.

I N D E P E N D E N T R E S E A R C H U P D A T E

DAVID WILLIAMSON ASSOCIATES LIMITED
116 Borough High Street, London, SE1 1LB

FEBRUARY 1992

Background

Crew controls two properties. The first, with immediate cash flow potential, is the Red Dog Hill deposit whilst the second, Kalder Lake, is a grass roots exploration property. This note focuses entirely on the Red Dog deposit, located on Vancouver Island, as it has the immediate potential of generating an enormous cash flow for a company the size of Crew. The copper/gold Red Dog deposit is of particular interest as it is located close to BHP Copper's huge Island Copper mine which has nearly exhausted its in-pit reserves. It is believed by the management of Crew, and we concur with their assessment, that ore from the Red Dog deposit could be quarried, crushed and transported by road and barge to the Island Copper milling facility to the mutual benefit of both the Island Copper operation and to Crew itself.

Until recently, Crew had an agreement with Moraga (another junior Canadian company) whereby, Moraga would eventually earn a substantial interest in the Red Dog deposit by expending significant agreed sums on the property's development. The arrangement was formulated in such a way that were the agreed expenditures not committed by a given date then Moraga would lose all its previously accrued interest in the Red Dog deposit which would revert 100% to Crew. Last year, Moraga was taken over by Jordex (another Canadian resources company) and, under its new management, the arrangement between Moraga and Crew was recently terminated. This means that Crew is once again in 100% control of their Red Dog deposit. The market, recognising that there had been differing corporate priorities between the management of Moraga and Crew reacted positively to the news and marked Crew's shares up by over 50%. The market perceived that the way is now clear for Crew to negotiate directly with BHP Copper for the development of their Red Dog deposit.

BHP Copper's Island Copper Facility

The Island Copper open-pit deposit is located close to the Holberg Inlet and the original deposit has been mined out to depth. The company is now stripping back its sea wall face in order to develop an additional 45Mtons of ore at depth. It is expected that during this "push back" period production will decline before recovering again during 1993. Nonetheless, it is estimated, that at their annual milling rate, of about 50,000tpd, the mine's current reserves will be exhausted by early 1996. Consequently, if ore from Crew's Red Dog deposit can be economically shipped to the Island Copper milling facility it should extend the operation's life until at least 1999. The attendant economic and social cost savings, not to mention delaying final close down and environmental costs associated with closure would be considerable. Furthermore, it would give BHP Copper's management additional time to delineate additional reserves in the locality.

The Red Dog Deposit

The Red Dog deposit is located at the summit of a small clear cut hill at an elevation of about 1500ft and is only 1.5 miles from the Holberg/Port Hardy road which provides good access to tidal water at Holberg, some seven miles away. As well as a 38 kv power supply the Holberg port is sound, having previously been used by the Canadian military forces. The proposed logistics would be to mine and crush the Red Dog ore, which has virtually no stripping ratio, transport it to the port and barge it to the Island Copper milling facility. It is on this premise that the economics below are based.

Quite extensive drilling has been undertaken over the Red Dog Hill. According to JB Engineering, an independent consultant, the following reserve estimates have been provided for the Red Dog Hill reserves. Various cut off grades were used for the computations.

Tonnage (mt)	Average grades	
	Cu (%)	Au(oz/t)
0-5	0.50	0.020
5-10	0.44	0.018
10-15	0.40	0.016
15-20	0.36	0.015
20-25	0.35	0.014

Interestingly, the grade of copper is very similar to that mined at Island Copper although the gold grade is significantly higher and, therefore, the recovery will be higher than that obtained by Island Copper. Initial ideas are that some 20,000tpd of Red Dog ore (7.3Mtpa) could be shipped to the Island Copper facility and that this would be sufficient for 3½ years of operations thereby extending Island Copper's life to 1999. Nevertheless, Crew would commit a portion of its income stream to develop further reserves at Red Dog where the potential for additional ore is excellent.

Indicated Economics

The costs of the operation can be divided into four main groupings. The first consists of mining and crushing the ore with associated site maintenance, waste disposal and grade control. The second concerns loading the crushed ore onto trucks and barges and the costs associated with trucking and barging it to the Island Copper facility. The third cost is the milling cost at Island Copper and finally there is the associated smelter costs for extracting the copper from the concentrate produced.

The total cost of the first two categories of mining and transportation are estimated at C\$4.12/t whilst milling costs are estimated at \$2.40/t. Hence, total operational costs equate to \$6.50/t. Smelter charges have been assumed at 33 c/lb of refined copper. Allowance has been made for a net smelter royalty payment of 3% and credits for molybdenum and silver of 40c/t. Full details of the assumptions and economics are given below.

Assumptions:

Quarry	20,000 tonnes per day (7.3mt pa)
Minimum average grade (recovery)	0.35% copper (90%) 0.014 oz ton gold (72%)
Copper price	\$1.00/lb
Gold price	\$375/oz
Silver/Molybdenum credits	40¢/ton
Smelter costs	33¢/lb copper refined \$1.00 US = \$1.16 CDN

Revenue/ton: US\$

Copper: 1.00x 0.35x 0.90 x 2205	6.95
Gold: 0.014x 0.72x 375	3.78
Mo/Ag:	<u>0.40</u>
Total	11.13
Less 3% NSR	0.33
Net revenue US\$	10.80
Net revenue CDN\$	12.52

Costs/ton: CDN\$

Mining, crushing and barging	4.12
Milling costs at Island Copper	2.40
Smelter cost	<u>2.66</u>
Total	9.18
Minimum Estimated profit per ton	
CDN\$ 12.52 -9.18	\$3.34

The Economics for Crew

Two cases have been examined; the first where Crew and BHP Copper split profits on a 50:50 basis. The second assumes that Crew will only retain 25% of the profits generated from the operation. The economics of the two cases are shown below:

Assuming that Crew/BHP Copper split profits:

	<i>Case (1) 50:50</i>	<i>Case (2) 25:75</i>
Total annual revenues (\$)	7,300,00 x 3.34 x 0.50	7,300,000 x 3.34 x 0.25
	\$12.19m	\$6.096m
Pre-tax profits	<u>124¢/share</u>	<u>62¢/share</u>
After tax profits*	80¢/share	40¢/share

* Assumes tax rate of 35%

On the assumption that Crew and BHP Copper will agree to split their profits on a 50:50 basis we calculate that Crew will earn after tax profits of about 80¢/share in their first full year of operation. On the other hand, were Crew only able to receive 25% of the profits generated then their after tax earnings would still amount to some 40¢/share. Even in the very unlikely event that no further ore reserves are found at Red Dog Hill then we calculate that the net present value of the cash flows that would accrue on a 50:50 profit basis to Crew, at a 10% discount rate, would be \$22.1m, equivalent to 225¢/share. Even if Crew were only to receive 25% of the profits then the net present value on the above basis would still be 112.5¢/share. We believe that these are highly conservative numbers as other reserves do exist within Crew's leases notably at their Slide Creek and M2 zones. Indeed, it is quite possible that ultimate reserves will end up between 50-100Mtons. If this were to be the case, then the long term effect on Crew's earnings and net present values would be significantly higher.

Current Funding Requirements

Crew has learned, through discussion with Island Copper engineering staff, that a final business plan proposal should contain data from the following additional studies budgeted by the company at \$250,000. A limited drill programme of six holes budgeted at \$100,000 is required on the southwest margin of the Red Dog Hill zone to established final pit design limits and further to enhance the overall reserve base. Metallurgical compatibility and optimized gold recovery studies, costing \$30,000 have been suggested. Essential environmental impact studies and project permitting through the Stage III submissions are budgeted at \$80,000 and must begin soon as an estimate of up to 12 months is required for permitting. Feasibility engineering studies are required as part of the permitting process and have been estimated at \$40,000. At a minimum therefore, the company must begin soon on work programmes costing \$250,000, in order to take the project to the development stage. Making allowance for working capital, Crew now need a further \$350,000 to reach the point where delivery of ore to Island Copper can commence, which should be during the first quarter 1993.



Crew Natural Resources Ltd.

“The
Company’s
current market
capitalization
does little
justice to either
the Company’s
assets or
potential”



ARTIST IMPRESSION RED DOG PIT

SHARE STRUCTURE

Authorized	: 50,000,000 shares
Issued	: 9,838,815 shares
Warrants	: 2,075,000
Directors/Employees Options	: 305,000
Fully Diluted Position	: 12,218,115
Present Market Capitalization	: \$4 million
Major Shareholders	: Crew Group & Assoc. (4,000,000 approx.)
Approx. Public Float	: 3,000,000

David Williamson
October, 1990

MANAGEMENT

The Board of Directors comprises:

Gerald D. Wright	- President and Director
John M. Darch	- Secretary and Director
Wayne Fallis	- Director
Robert B. Anderson	- Director

Mr. Darch and **Dr. Wright** are Senior Partners of the Crew Group, having backgrounds in commercial financing and professional engineering, respectively, and holding directorships in Asia Pacific Resources Ltd. and Canadian Crew Energy Corp. **Mr. Fallis** has a long and distinguished business career in international shipping and trading and is President and Chief Executive Officer of

of his own shipping company which is active in both Europe and the Pacific Rim. **Mr. Anderson** is currently employed as Manager of Explorations by the Crew Group of Companies. **Mr. Anderson's** background includes 20 years experience as an exploration geologist in various Pacific Rim countries involved in developing base metals, precious metals and coal projects.