FEASIBILITY STUDY
KERR ADDISON MINES LIMITED
ADANAC PROJECT

VOLUME I

SUMMARY

FOREWORD

In April, 1970, Chapman, Wood & Griswold Ltd. was retained by Kerr Addison Mines Limited to undertake a feasibility study and report on the Adanac Project involving evaluation of the Ruby Creek molybdenum deposit near Atlin, British Columbia.

Shortly thereafter, Kaiser Engineers Division of Henry J. Kaiser (Canada) Ltd. was engaged by Kerr Addison in the capacity of mill design engineers to prepare engineering studies, cost estimates, and conceptual layout for proposed concentrator and surface plant facilities.

CW&G has acted as coordinating consultant, with prime responsibility for producing the final feasibility report.

The end product, however, represents a team effort to which many individuals contributed their various specialized talents; and it is fitting that full acknowledgement be given to the principal participants forthwith:

Mr. J. H. Stovel, President	Kerr Addison Mines Limited
Dr. P. M. Kavanagh, Vice-President	" " " "
Peter Stym, Project Manager	" " " "
William Sirola, Resident Geologist	" " " "
J. E. Wallis, Project Engineer	" " " "
John W. Britton, Consulting Metallurgist	Britton Research Limited
F. Walton Maund, Construction Consultant	
F. R. Charles, Project Manager	Kaiser Engineers
H. Lyall Ames, Milling Consultant	Associate, CW&G Ltd.

Particular acknowledgement is due to Mr. Peter Stym for the expeditious manner in which the field program was implemented, as well as for his contributions in mine planning and general overall review.

Mr. William Sirola likewise supplied much valuable assistance in planning; and in review and interpretation of geologic, drilling and sampling data.

The CWG staff members directly involved in the Adanac Project were:

E. P. Chapman Jr.	President
John A. Wood	Vice-President, Project Coordinator
C. R. D. Miller	Chief Geologist
W. A. Hepenstall	Chief Mining Engineer
E. S. Holt	Project Geologist
A. M. Coode	Director, Systems Engineering Department
J. L. McCrea	Metallurgical Engineer
R. H. Janes	Geologist
E. C. Holt	Geologist

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I

SUMMARY & CONCLUSIONS

I

SUMMARY AND CONCLUSIONS

The Ruby Creek molybdenum occurrence is a bulk low grade type of deposit amenable to extraction by open pit mining methods.

The principal mineral of economic importance is molybdenite (MoS_2).

Mineable open pit reserves are estimated at 104,234,000 tons with an overall average grade of 0.16 percent MoS_2.

In our opinion mill feed during the first 5 or 6 years of operation could be upgraded by selective mining and stockpiling to a range of 0.18 to 0.20 leaving residual reserves averaging approximately 0.148.

Engineering and economic studies have been made on proposed operations of 15,000; 18,000; and 20,000 tons per day milling capacity. Of the rates investigated 18,000 TPD appears to be optimum when considering rate of return vs. magnitude of investment capital.

Results of economic projections clearly indicate that if the source of investment capital were to be 100 percent borrowing at an interest rate of $7\frac{1}{2}$ percent, the loan cannot be fully repaid; and therefore that an operation at any of the three tonnage rates would not be viable under current economic conditions.

A cash flow analysis at the 18,000 ton milling rate, a market price per pound of Mo of $1.92 U.S., 100% equity capital and present tax laws applicable showed that accumulated net cash flow equals the initial investment of $73,763,000 in 8.9 years after the start of production. The total accumulated cash flow over the estimated life of the operation amounts to $112,708,000. The present value of this cash flow discounted at a rate of 12% compounded annually is $49,871,000. The present value would equal the initial investment at a discount rate of approximately 5.5 percent.

While overall grade of the Ruby Creek deposit is in the range of some established viable open pit operations, there are several factors which at the present time adversely affect the economics of any proposed operation. These are:

1. Precipitous increase in plant capital costs due to abnormal escalations in construction labour rates which are magnified in areas remote from population centres.

2. Lack of a cheap power source.

3. Excessively high transportation costs.

In conclusion it is our opinion that in the short term the Ruby Creek deposit could not sustain an operation with adequate profit margins. However we consider it to be a significant source of molybdenum having an appreciable long term potential. Viability will depend on future major improvements in power development, transportation, and metal prices.

Respectfully submitted,
CHAPMAN, WOOD & GRISWOLD LTD

C.R D. Miller

W.A. Hepenstall

E.S. Holt

A.M. Coode

J. L. McCrea

APPROVED:

E.P. Chapman, Jr.,
President

John A. Wood,
Vice President

April 14th, 1971

CERTIFICATE

I, Carl R. D. Miller of Vancouver, British Columbia, do hereby certify:

1. That I am a Geologist residing at 2732 Oliver Crescent, Vancouver, British Columbia.

2. That I am a registered Professional Engineer in the Province of British Columbia.

3. That I am employed by Chapman, Wood & Griswold Ltd., Consulting Mining Engineers and Geologists, 145 East 15th Street, North Vancouver, British Columbia.

4. That I have practised my profession for over twenty years.

5. That I have no direct, indirect, or contingent interests in Kerr Addison Mines Ltd., Adanac Mining and Exploration Ltd. (N.P.L.), or any of the properties controlled by these Companies.

6. That I do have personal knowledge of this deposit, having visited the property on different occasions during 1970.

Carl R. D. Miller, P. Eng.

April 13, 1971

CERTIFICATE

I, William Alan Hepenstall, of North Vancouver, British Columbia, do hereby certify:

1. That I am a Mining Engineer residing at 4108 Skyline Drive, North Vancouver, British Columbia.

2. That I am employed by Chapman, Wood & Griswold Ltd., Consulting Mining Engineers and Geologists, with offices at 145 East 15th Street, North Vancouver, British Columbia.

3. That I am a registered Professional Engineer in the Province of British Columbia.

4. That I have practised my profession for more than thirty years.

5. That I have no direct, indirect, or contingent interests in Kerr Addison Mines Ltd., Adanac Mining and Exploration Ltd. (N.P.L.), or any of the properties controlled by these Companies.

6. That I do have personal knowledge of this property, having visited the property on different occasions during 1970.

Wm. Hepenstall

William Alan Hepenstall, P. Eng.

April 13, 1971

CHAPMAN WOOD & GRISWOLD LTD.

CERTIFICATE

I, E. S. Holt of North Vancouver, British Columbia, do hereby certify:

1. That I am a Geologist residing at 4091 St. Albans Ave., North Vancouver, British Columbia.

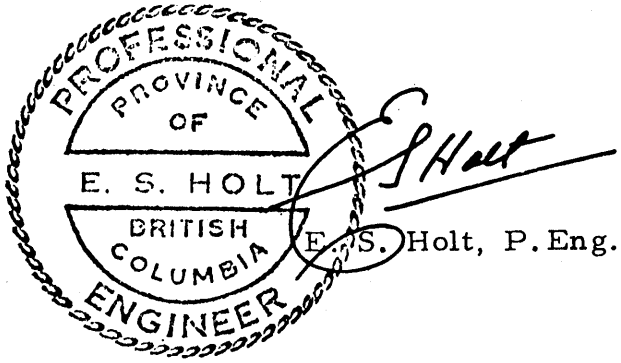
2. That I am a Professional Engineer registered in the Province of British Columbia.

3. That I am employed by Chapman, Wood & Griswold Ltd., Consulting Mining Engineers and Geologists, 145 East 15th Street, North Vancouver, British Columbia.

4. That I have practised my profession for more than ten years.

5. That I have no direct or indirect interest in Kerr Addison Mines Ltd. or Adanac Mining and Exploration Ltd. (N.P.L.) nor do I expect to receive any such interest.

6. That I have personal knowledge of the Ruby Creek molybdenum deposit being developed by Adanac Mining and Exploration Ltd. (N.P.L.) in the Atlin Mining Division, British Columbia, having personally examined the property and sampling methods on several occasions during both 1969 and 1970. I have evaluated the data and information furnished to us by Adanac Mining and Exploration Ltd. (N.P.L.) and Kerr Addison Mines Ltd.



E. S. Holt, P. Eng.

April 13, 1971

CHAPMAN WOOD & GRISWOLD LTD.

CERTIFICATE

I, Alan M. Coode, of North Vancouver, British Columbia, do hereby certify:

1. That I am a Geological Engineer, residing at 702 Barnham Road, West Vancouver, British Columbia.

2. That I am employed by Chapman, Wood & Griswold Ltd., Consulting Mining Engineers and Geologists, with offices at 145 East 15th Street, North Vancouver, British Columbia as Manager and Director of the Systems Engineering Department.

3. That I have practised my profession for two and a half years.

4. That I have no direct, indirect or contingent interests in Kerr Addison Mines Ltd. or Adanac Mining and Exploration Ltd. (N.P.L.) or any of the properties controlled by these companies, nor do I expect to receive any such interest.

5. That I am personally familiar with technical and geological data pertaining to the Ruby Creek Molybdenum Deposit, although I have not visited the property.

A. M. Coode.

Alan M. Coode, Ph.D.

April 14, 1971

CERTIFICATE

I, J. L. McCrea of North Vancouver, British Columbia, do hereby certify:

1. That I am a Metallurgist residing at 4271 Highland Blvd., North Vancouver, British Columbia.

2. That I am employed by Chapman, Wood & Griswold Ltd., Consulting Mining Engineers and Geologists, 145 East 15th Street, North Vancouver, British Columbia.

3. That I have practised my profession for seven years.

4. That I have no direct or indirect interest in Kerr Addison Mines Ltd. or Adanac Mining and Exploration Ltd. (N.P.L.), nor do I expect to receive any such interest.

5. That I am familiar with plants of this type and have reviewed the data supplied by Kaiser Engineers Division of Henry J. Kaiser Company (Canada) Ltd.

J. L. McCrea

April 13, 1971

CERTIFICATE

I, E. P. Chapman Jr. of North Vancouver, British Columbia, do hereby certify:

1. That I am a Mining and Geological Engineer residing at 2135 Argyle Avenue, West Vancouver, British Columbia.

2. That I am President of Chapman, Wood & Griswold Ltd., Consulting Mining Engineers and Geologists, with offices at 145 East 15th Street, North Vancouver, British Columbia.

3. That I am a registered Professional Engineer in the Province of British Columbia and in the States of Colorado, New Mexico and Texas, and that I am a member of the Consulting Engineers' Division of the Association of Professional Engineers of British Columbia.

4. That I have practised my profession for more than 30 years.

5. That I have no direct or indirect interest in Kerr Addison Mines Ltd. or Adanac Mining and Exploration Ltd. (N.P.L.), nor do I expect to receive any such interest.

6. That I have personal knowledge of the Ruby Creek molybdenum deposit being developed by Adanac Mining and Exploration Ltd. (N.P.L.) in the Atlin Mining Division, British Columbia. I personally visited the property during 1970 and have critically reviewed and evaluated the data and information contained in this report.

PROFESSIONAL ENGINEER PROVINCE OF BRITISH COLUMBIA E. P. CHAPMAN, JR.

E. P. Chapman Jr., P. Eng.

April 13, 1971

CHAPMAN WOOD & GRISWOLD LTD.

CERTIFICATION

I, John A. Wood of North Vancouver, British Columbia, do hereby certify:

1. That I am a geologist, residing at 5019 Howe Sound Lane, West Vancouver, British Columbia.

2. That I am Vice President of Chapman, Wood & Griswold Ltd., Consulting Mining Engineers and Geologists, 145 East 15th Street, North Vancouver, British Columbia.

3. That I have practised my profession for more than 35 years.

4. That I have no direct or indirect interest in Kerr Addison Mines Limited nor in Adanac Mining and Exploration Ltd. (N.P.L); and that I do not expect to receive any direct or indirect interest in said companies.

5. That I have personal knowledge of the Ruby Creek molybdenum deposit by reason of having visited the property on several occasions during the 1970 development - feasibility program.

John A. Wood

John A. Wood

April 14th, 1971

II

TERMS OF REFERENCE

PROJECT CRITERIA

Chapman, Wood & Griswold Ltd., as coordinating consultant, has been responsible for interfacing functions of the various firms and individuals involved in producing or securing the engineering data upon which evaluation of the Ruby Creek molybdenum deposit has been based.

Kerr Addison Mines Limited set conceptual guidelines to be followed within a permissible budget and the general outline of a development program recommended by CW&G to Adanac Mining and Exploration Ltd. prior to agreement by Kerr Addison to implement such a program.

The basic concept of the evaluation has been to develop all data from a realistic standpoint consistent with good mine operating procedures.

Any proposed production scale plan was to be adequate in design, but not over-designed.

The attitude toward environmental problems was to be one of compliance instead of circumvention of control regulations.

The policy on housing of personnel was to provide an integrated townsite of a standard which would tend to attract permanent employees.

Effect of severe winter conditions on operations and costs was to be thoroughly assessed, and adequate provisions made for same.

METALLURGICAL RECOVERY

Even though the pilot mill operation attained exceptionally high recovery of molybdenite on a sustained basis - frequently over 95 percent - the consensus of opinion of the Technical Coordinating Committee was that there is little likelihood that a production scale plant could achieve the same results.

In the economic projections the controls applied to milling recoveries are as follows:

1.	Pit mill feed above 0.145% MoS_2	-	94%
	Except 1st operating year	-	92%
2.	Stockpile re-claim	-	89%
3.	Mill feed average 0.13 to 0.144	-	92%
4.	Mill feed average 0.12 to 0.129	-	91%
5.	Mill feed below 0.12	-	90%

MARKETING

Since Kerr Addison had made arrangements for marketing of molybdenite concentrate through Noranda Sales Corporation in event the property was to be brought into production, it has not been within the scope of this report to present more than a brief commentary on marketing.

The economic analyses have been based on the assumption that whatever amounts of molybdenite could be produced would be sold, and as a premium grade product.

SOURCE OF INVESTMENT CAPITAL

On instructions from Kerr Addison, the cash flow projections have treated the source of capital as being 100 percent loan; and a mutally acceptable interest rate was set at $7\frac{1}{2}$ percent.

One case assuming 100 percent equity capital has been shown for comparative purposes.

The only Present Value analysis included in the report is that for the equity case.

III

ECONOMIC PROJECTIONS - SUMMARY

SUMMARY OF CASH FLOW PROJECTIONS

Data Refer to End of Mine Life

Units in 1000 Canadian Dollars

Case Number	Description	Operating Profit	Interest Paid	Total Taxes	Loan Repayment	Unpaid Loan Balance Minus Cum. Cash Flow [1]	Cum. PV @ 12% [2]	Cum. PV @ 14% [2]	Cum. PV @ 16% [2]	Equity Repayment Time - Years -
UNDER PRESENT TAXES										
5 A-1	15,000 TPD, $1.82 Mo. Loan	92852	92852	0	0	69588	-	-	-	-
5 B-1	18,000 TPD, $1.82 Mo. Loan	105945	92039	0	12515	59857	-	-	-	-
5 B-2	18,000 TPD, $1.92 Mo. Loan	125151	78027	0	42411	26640	-	-	-	-
5 B-3	18,000 TPD, $1.92 Mo. Equity	125151	-	12443	-	(112708) [3]	49871	44902	40692	8.879 [4]
5 C-1	20,000 TPD, $1.82 Mo. Loan	112790	89127	0	21296	56777	-	-	-	-
UNDER WHITE PAPER PROPOSALS OF NOVEMBER, 1969 AND AMENDMENTS OF AUGUST, 1970										
5 A-1	15,000 TPD, $1.82 Mo. Loan	92852	92852	0	0	69588	-	-	-	-
5 B-1	18,000 TPD, $1.82 Mo. Loan	105945	94724	0	7716	62543	-	-	-	-
5 B-2	18,000 TPD, $1.92 Mo. Loan	125151	81579	0	34812	30192	-	-	-	-
5 B-3	18,000 TPD, $1.92 Mo. Equity	125151	-	18510	-	(106641) [3]	48064	43405	39449	9.330 [4]
5 C-1	20,000 TPD, $1.82 Mo. Loan	112790	92030	0	15100	59679	-	-	-	-

1 Cum. Cumulative

2 PV Present Value

3 Figures in Brackets are Cumulative Net Cash Flow

4 From Start of Production

IN THE FIRST TABLE NEW CAPITAL ASSETS ARE DEDUCTED AFTER LOAN REPAYMENT

IN THE SECOND TABLE NEW CAPITAL ASSETS ARE DEDUCTED BEFORE LOAN REPAYMENT

DETAILS OF ECONOMIC PROJECTIONS APPEAR IN VOLUMES II & IV

IV

COSTS - SUMMARY

IV

COSTS - SUMMARY

CAPITAL COSTS

SUMMARY OF INVESTMENT CAPITAL

The estimates as tabulated are based on the assumption that a decision to bring the property into production would be made by mid-year, 1971, and that a construction schedule could be maintained which would permit start of tune-up operations in October, 1973. Allowances have been made for escalations and contingencies, but not specifically for any major work stoppages due to strikes or lockouts. Details of cost estimates appear in Volume II of this report.

	A. 15,000 TPD	B. 18,000 TPD	C. 20,000 TPD
Pre-Production Pit Preparation	$ 3,465,000	$ 3,465,000	$ 3,465,000
Road Construction	500,000	500,000	500,000
Mine Equipment	4,920,000	5,417,000	6,543,000
Concentrator and Surface Plant (including Water and Tailings)	50,672,000	53,350,000	57,900,000
Townsite	5,551,000	5,551,000	5,551,000
Options and Advance Royalty	480,000	480,000	480,000
Working Capital	4,600,000	5,000,000	5,600,000
Total Investment Capital	$70,188,000	$73,763,000	$80,039,000

OPERATING COSTS

All estimated operating costs have been escalated to date of production start-up, January, 1974.

It should be noted that operating costs vary slightly from year to year depending on the changing stripping ratios during the life of the mine.

ESTIMATED OPERATING COSTS BY YEARS - VARIOUS MILLING RATES

A. 15,000 TPD Mill

Year		Tons Milled	Grade % MoS_2	Cost Per Ton $				Annual Cost $
				Mining	Milling	G & A	Total	
1974 =	1	5,250,000	.210	.9147	1.2716	.5175	2.704	14,196,000
	2	"	.190	.9147	1.2716	.5175	2.704	14,196,000
	3	"	.185	.9147	1.2716	.5175	2.704	14,196,000
	4	"	.184	.9147	1.2716	.5175	2.704	14,196,000
	5	"	.183	.9147	1.2716	.5175	2.704	14,196,000
	6	"	.183	.9147	1.2716	.5175	2.704	14,196,000
	7	"	.161	.8142	1.2716	.5175	2.603	13,666,000
	8	"	.149	.6233	1.2716	.5175	2.412	12,663,000
	9	"	.149	.6233	1.2716	.5175	2.412	12,663,000
	10	"	.149	.6233	1.2716	.5175	2.412	12,663,000
	11	"	.149	.6233	1.2716	.5175	2.412	12,663,000
	12	"	.148	.6233	1.2716	.5175	2.412	12,663,000
	13	"	.148	.6233	1.2716	.5175	2.412	12,663,000
	14	"	.148	.6233	1.2716	.5175	2.412	12,663,000
	15	"	.148	.6233	1.2716	.5175	2.412	12,663,000
	16	"	.148	.6233	1.2716	.5175	2.412	12,663,000
	17	"	.148	.6233	1.2716	.5175	2.412	12,663,000
	18	"	.148	.4874	1.2716	.5175	2.276	11,949,000
	19	"	.148	.3882	1.2716	.5175	2.177	11,429,000
	20	4,484,000	.111	.1200	1.2716	.5175	1.909	8,560,000

B. 18,000 TPD Mill

Year	Tons Milled	Grade % MoS_2	Cost Per Ton $				Annual Cost $
			Mining	Milling	G & A	Total	
1974 = 1	6,300,000	.210	.9010	1.2302	.4546	2.586	16,292,000
2	"	.185	.9010	1.2302	.4546	2.586	16,292,000
3	"	.184	.9010	1.2302	.4546	2.586	16,292,000
4	"	.183	.9010	1.2302	.4546	2.586	16,292,000
5	"	.183	.9010	1.2302	.4546	2.586	16,292,000
6	"	.161	.6006	1.2302	.4546	2.285	14,395,000
7	"	.148	.5949	1.2302	.4546	2.280	14,364,000
8	"	.148	.5949	1.2302	.4546	2.280	14,364,000
9	"	.148	.5949	1.2302	.4546	2.280	14,364,000
10	"	.148	.5949	1.2302	.4546	2.280	14,364,000
11	"	.148	.5949	1.2302	.4546	2.280	14,364,000
12	"	.148	.5949	1.2302	.4546	2.280	14,364,000
13	"	.148	.5949	1.2302	.4546	2.280	14,364,000
14	"	.148	.5949	1.2302	.4546	2.280	14,364,000
15	"	.148	.5949	1.2302	.4546	2.280	14,364,000
16	"	.142	.2995	1.2302	.4546	1.984	12,499,000
17	3,434,000	.110	.1200	1.2302	.4546	1.805	6,198,000

C. 20,000 TPD Mill

Year		Tons Milled	Grade % MoS_2	Cost Per Ton $				Annual Cost $
				Mining	Milling	G & A	Total	
1974 =	1	7,000,000	.207	.8779	1.2086	.4219	2.508	17,556,000
	2	"	.185	.8779	1.2086	.4219	2.508	17,556,000
	3	"	.184	.8779	1.2086	.4219	2.508	17,556,000
	4	"	.183	.8779	1.2086	.4219	2.508	17,556,000
	5	"	.177	.8779	1.2086	.4219	2.508	17,556,000
	6	"	.148	.5936	1.2086	.4219	2.224	15,568,000
	7	"	.148	.5936	1.2086	.4219	2.224	15,568,000
	8	"	.148	.5936	1.2086	.4219	2.224	15,568,000
	9	"	.148	.5936	1.2086	.4219	2.224	15,568,000
	10	"	.148	.5936	1.2086	.4219	2.224	15,568,000
	11	"	.148	.5936	1.2086	.4219	2.224	15,568,000
	12	"	.148	.5462	1.2086	.4219	2.177	15,239,000
	13	"	.148	.5462	1.2086	.4219	2.177	15,239,000
	14	"	.146	.3958	1.2086	.4219	2.026	14,182,000
	15	6,234,000	.122	.1200	1.2086	.4219	1.750	10,909,000

MINE OPERATING COSTS BY YEARS

Year	A. 15,000 TPD Mill			B. 18,000 TPD Mill			C. 20,000 TPD Mill		
	Tons Mined	$ Year	$ T Milled	Tons Mined	$ Year	$ T Milled	Tons Mined	$ Year	$ T Milled
1974 = 1	11,795,000	4,802,300	.9147	14,175,000	5,676,000	.9010	15,750,000	6,145,400	.8779
2	11,795,000	4,802,300	.9147	14,175,000	5,676,000	.9010	15,750,000	6,145,400	.8779
3	11,795,000	4,802,300	.9147	14,175,000	5,676,000	.9010	15,750,000	6,145,400	.8779
4	11,795,000	4,802,300	.9147	14,175,000	5,676,000	.9010	15,750,000	6,145,400	.8779
5	11,795,000	4,802,300	.9147	14,175,000	5,676,000	.9010	15,750,000	6,145,400	.8779
6	11,795,000	4,802,300	.9147	9,450,000	3,783,800	.6006	9,500,000	4,155,300	.5936
7	10,500,000	4,274,500	.8142	8,450,000	3,748,100	.5949	9,500,000	4,155,300	.5936
8	6,875,000	3,272,100	.6233	8,450,000	3,748,100	.5949	9,500,000	4,155,300	.5936
9	6,875,000	3,272,100	.6233	8,450,000	3,748,100	.5949	9,500,000	4,155,300	.5936
10	6,875,000	3,272,100	.6233	8,450,000	3,748,100	.5949	9,500,000	4,155,300	.5936
11	6,875,000	3,272,100	.6233	8,450,000	3,748,100	.5949	9,500,000	4,155,300	.5936
12	6,875,000	3,272,100	.6233	8,450,000	3,748,100	.5949	9,000,000	3,943,200	.5462
13	6,875,000	3,272,100	.6233	8,450,000	3,748,100	.5949	9,000,000	3,943,200	.5462
14	6,875,000	3,272,100	.6233	8,450,000	3,748,100	.5949	5,862,000	2,771,000	.3958
15	6,875,000	3,272,100	.6233	8,450,000	3,748,100	.5949	6,234,000	748,100	.1200
16	6,875,000	3,272,100	.6233	3,237,000	1,886,800	.2995			
17	6,875,000	3,272,100	.6233	3,434,000	412,100	.1200			
18	5,300,000	2,559,100	.4874						
19	4,160,000	2,038,200	.3882						
20	4,484,000	538,100	.1200						

Further details of unit mining costs appear in Section X MINING PLAN.

TABLE XVIII-1

SUMMARY OF MILLING COSTS AT VARIOUS MILLING RATES

Item	15,000 T.P.D.		18,000 T.P.D.		20,000 T.P.D.	
	$ Per Year	$/Ton Milled	$ Per Year	$/Ton Milled	$ Per Year	$/Ton Milled
Labour	$1,244,080	$0.2370	$1,255,990	$0.1994	1,255,990	$0.1794
Steel	2,166,150	0.4126	2,599,380	0.4126	2,888,200	0.4126
Flotation Reagents	988,500	0.1883	1,186,200	0.1883	1,318,000	0.1883
Power	1,840,200	0.3503	2,207,900	0.3504	2,455,500	0.3508
Maintenance Supplies (est.)	315,000	0.0600	378,000	0.0600	420,000	0.0600
Heating	122,850	0.0234	122,850	0.0195	122,850	0.0175
TOTAL	$6,676,780	$1.2716	$7,750,320	$1.2302	$8,460,540	$1.2086

GENERAL AND ADMINISTRATIVE COSTS AT VARIOUS MILLING RATES

	A 15,000 TPD		B 18,000 TPD		C 20,000 TPD	
	$ Year	$ T Milled	$ Year	$ T Milled	$ Year	$ T Milled
Administration - salaries	$ 244,000	.0465	$ 244,000	.0387	$ 244,000	.0348
General Engrg. - salaries	96,000	.0183	96,000	.0152	96,000	.0137
Plant Services						
Salaries and Wages $491,825 (excl. power labour)						
Fuel, parts, supplies for roads, yard, office 100,000	591,825	.1127	591,825	.0939	591,825	.0845
Insurance, taxes, permits, est.	100,000	.0190	100,000	.0159	100,000	.0143
Outside services	50,000	.0095	50,000	.0079	50,000	.0071
Townsite, wages and salaries	122,800	.0234	122,800	.0195	122,800	.0175
Communications	33,000	.0063	33,000	.0052	33,000	.0047
Catering subsidy, 150 men @ $9/day	492,750	.0939	492,750	.0782	492,750	.0704
Ancillary heating, KE Table VIII-7	155,790	.0297	155,790	.0247	155,790	.0222
Miscellaneous power and lighting	208,900	.0398	234,100	.0371	251,100	.0359
Concentrate haul equalization, mine to North Vancouver docks	621,900	.1185	734,900	.1181	815,915	.1165
TOTAL G & A	$2,716,965	.5175	$2,864,165	.4546	$2,953,180	.4219

V

GENERAL DESCRIPTIONS

HISTORY

Since 1898 prospecting and the working of placer gold deposits have been the chief source of Atlin's economy. Although the Ruby Creek Molybdenum showing has been known for some time, no work was done on the deposit until the summer of 1968.

The property was staked for Adanac Mining and Exploration Co. Ltd. in 1967. During the field season of 1968 an access road was extended to the showings, a camp established, a geochemical survey carried out and a diamond drilling program initiated. Twelve diamond drill holes totalling 4928 feet were completed prior to winter shutdown.

During 1969 a major grid pattern diamond drilling program consisting of 36,985 feet in 68 holes was implemented. Bench scale metallurgical test work was begun and preliminary economic studies were undertaken.

In the spring of 1970 the Kerr Addison - Adanac agreement was finalized and a full scale feasibility program commenced. It included a continued grid pattern diamond drilling program, a large underground bulk sampling and pilot milling program, together with the related engineering studies required for the feasibility study.

LOCATION AND ACCESS

The Ruby Creek deposit is located within the Atlin Mining Division in the extreme northwestern portion of British Columbia. It is 15 miles N.E. of Atlin and approximately 90 air miles S.E. of Whitehorse in Yukon Territory. More specifically, the property is located at the headwaters of Ruby Creek, in a broad open valley, at an elevation of approximately 5000 feet above sea level. The geodetic co-ordinates are 59°43'N 133°24'W.

The property is accessible from Atlin by 24 miles of dirt road, the first 12 miles of which to Surprise Lake is graded and in fair condition. The town of Atlin is in turn accessible from Whitehorse by 118 miles of well

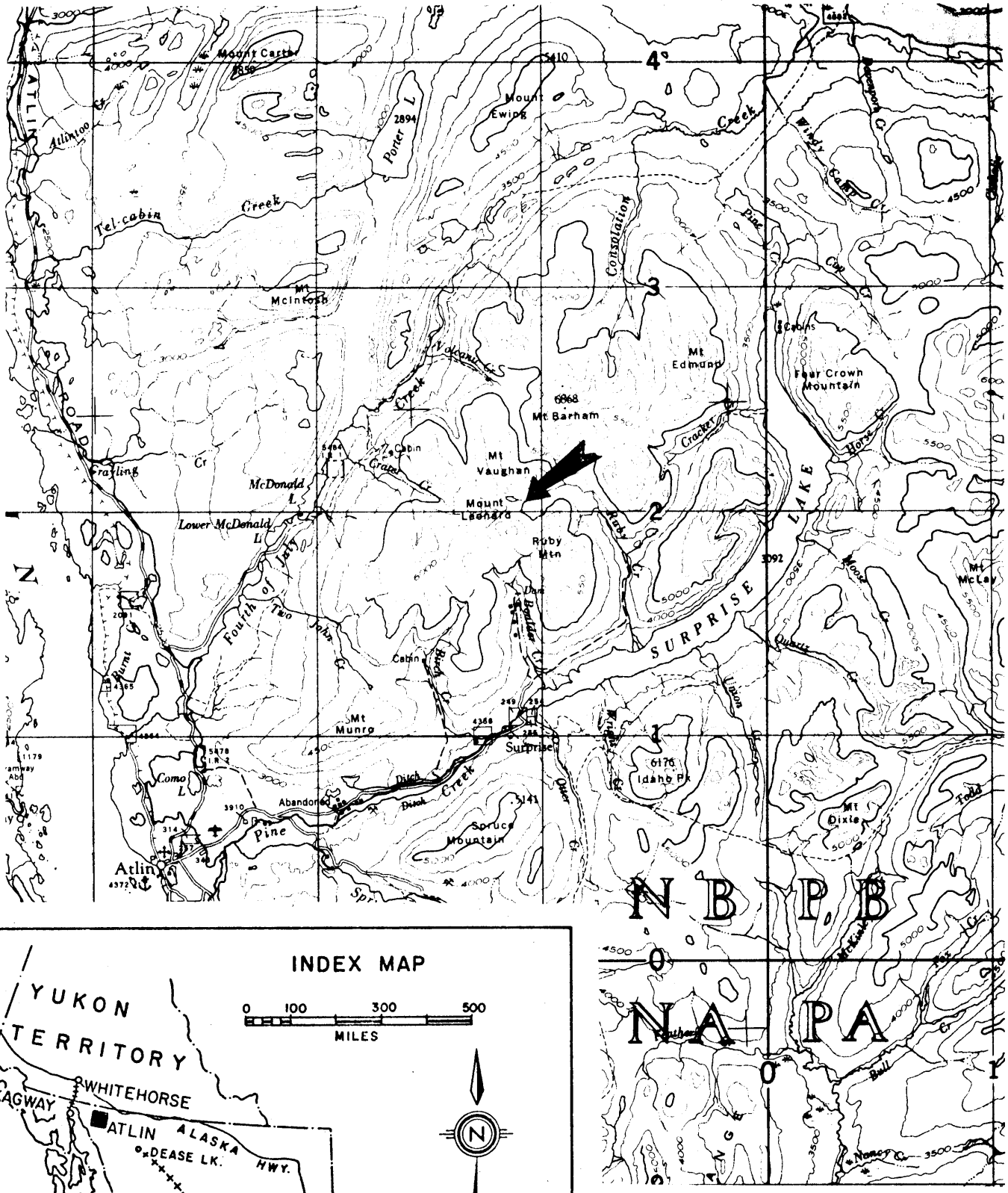
maintained gravel road. This access includes 58 miles along the Alaska Highway between Whitehorse and Jake's Corner.

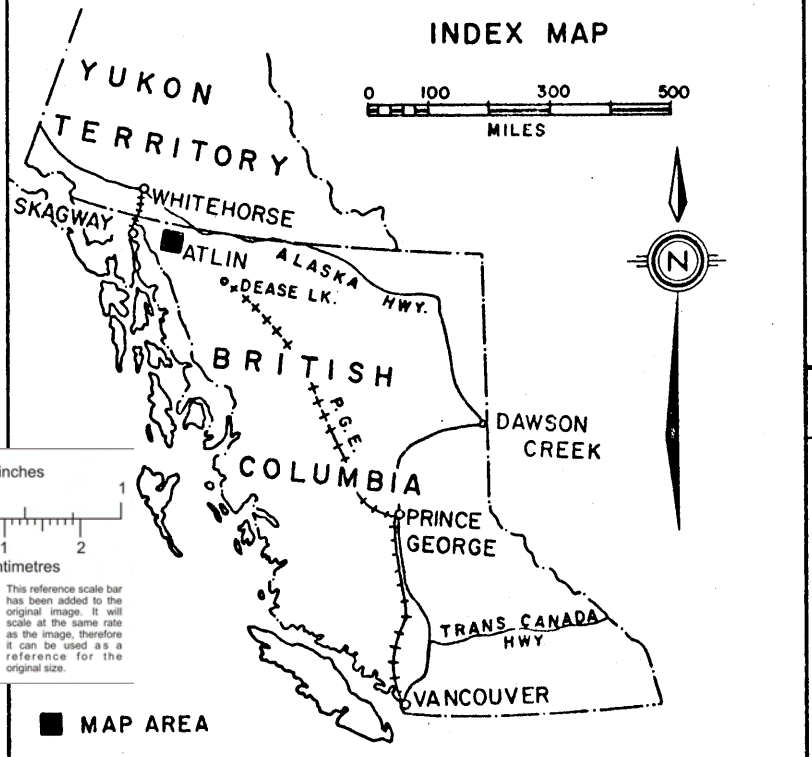
Float equipped aircraft using the sheltered bay at Atlin is a common form of transport in this area. A gravel airstrip exists outside the town, but is seldom used.

The town of Atlin at present has a population of approximately 500 people. No services of significant benefit to a mining operation such as Adanac exist in the immediate area.

Whitehorse, a city of approximately 11,000 population is the service centre for the region. Air transport is available with regularly scheduled daily flights from both Edmonton and Vancouver; it is also serviced by rail via the White Pass railroad to tidewater at Skagway, Alaska and by motor transport along the Alaska Highway from Edmonton.

Whitehorse has recently become a significant mining centre and undoubtedly would supply part of the labour force and some of the services required at Adanac.





KERR ADDISON MINES LIMITED

ATLIN MINING DIVISION

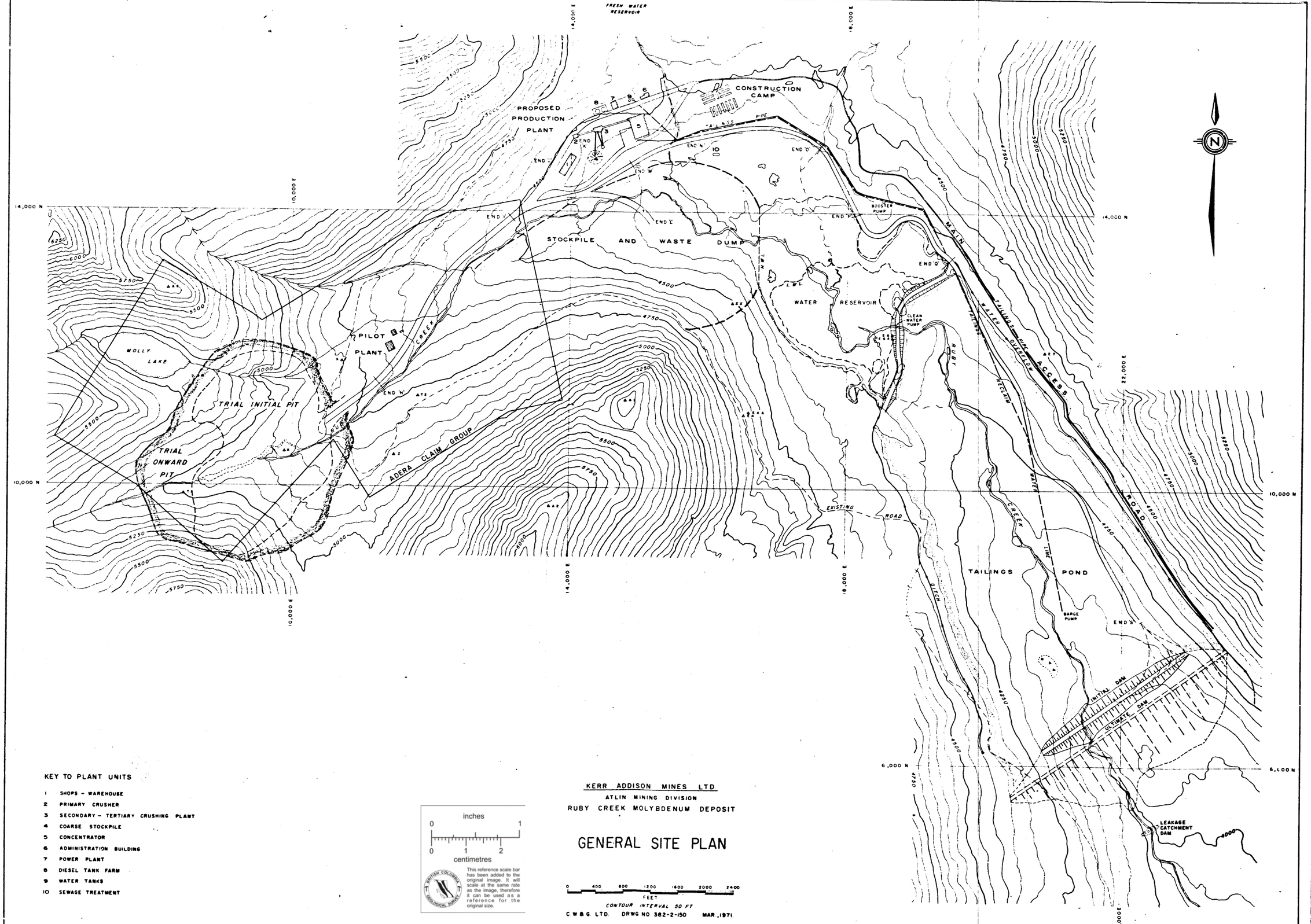
RUBY CREEK MOLYBDENUM DEPOSIT

LOCATION MAP

0 1 2 3 4 5 10

MILES

C.W.&G. LTD. DRWG. N° 382-2-156 MARCH, 1971



KEY TO PLANT UNITS

1. SHOPS - WAREHOUSE
2. PRIMARY CRUSHER
3. SECONDARY - TERTIARY CRUSHING PLANT
4. COARSE STOCKPILE
5. CONCENTRATOR
6. ADMINISTRATION BUILDING
7. POWER PLANT
8. DIESEL TANK FARM
9. WATER TANKS
10. SEWAGE TREATMENT

inches
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centimetres

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BRITISH COLUMBIA GEOLOGICAL SURVEY

KERR ADDISON MINES LTD.

ATLIN MINING DIVISION

RUBY CREEK MOLYBDENUM DEPOSIT

GENERAL SITE PLAN

0 400 800 1200 1600 2000 2400
FEET

CONTOUR INTERVAL 50 FT

C.W.B.G. LTD. DRWG NO. 382-2-150 MAR., 1971

MINE SETTING

The proposed mine plant and service facilities would be located along the Ruby Creek valley downstream from the pit area. The conceptual layout is shown on Drwg. No. 382-2-150, General Site Plan, on the following page.

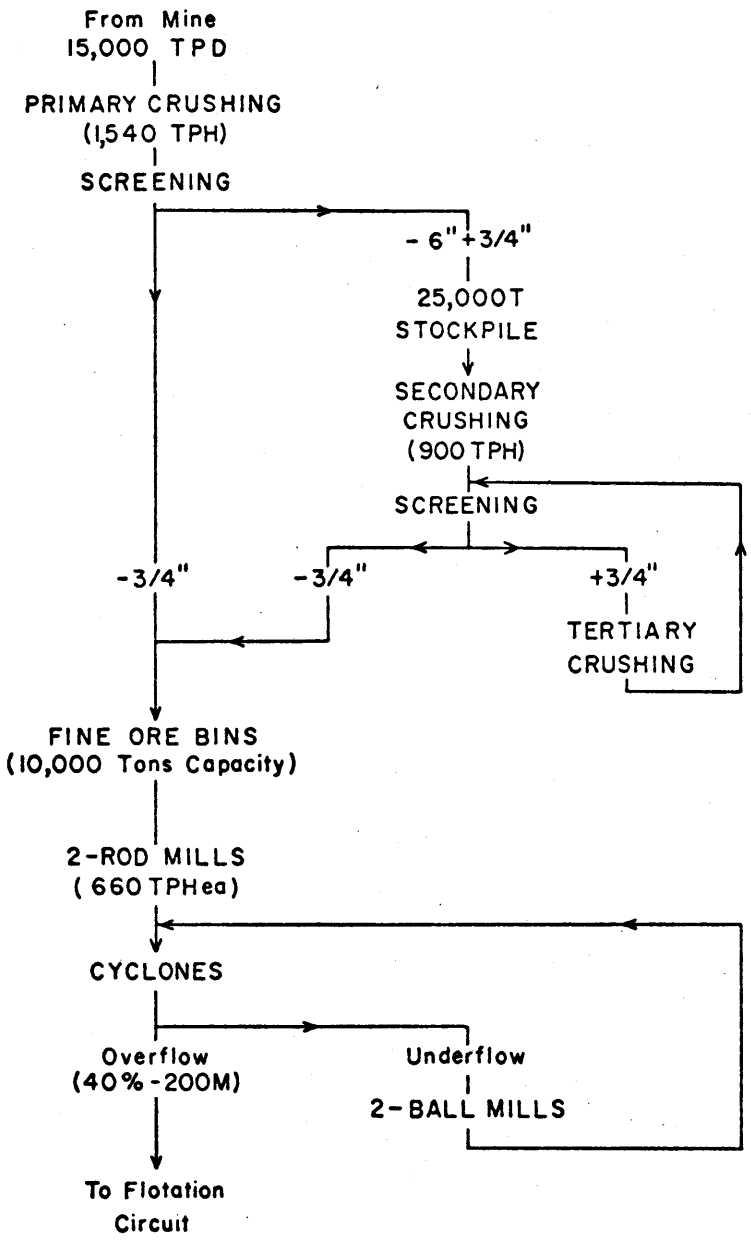
Concentration of molybdenite would be by conventional rodmill - ball mill grinding followed by flotation, and possibly batch leaching to remove minor sulfide impurities. Typical flowsheet for a 15,000 TPD plant is shown on page V-6.

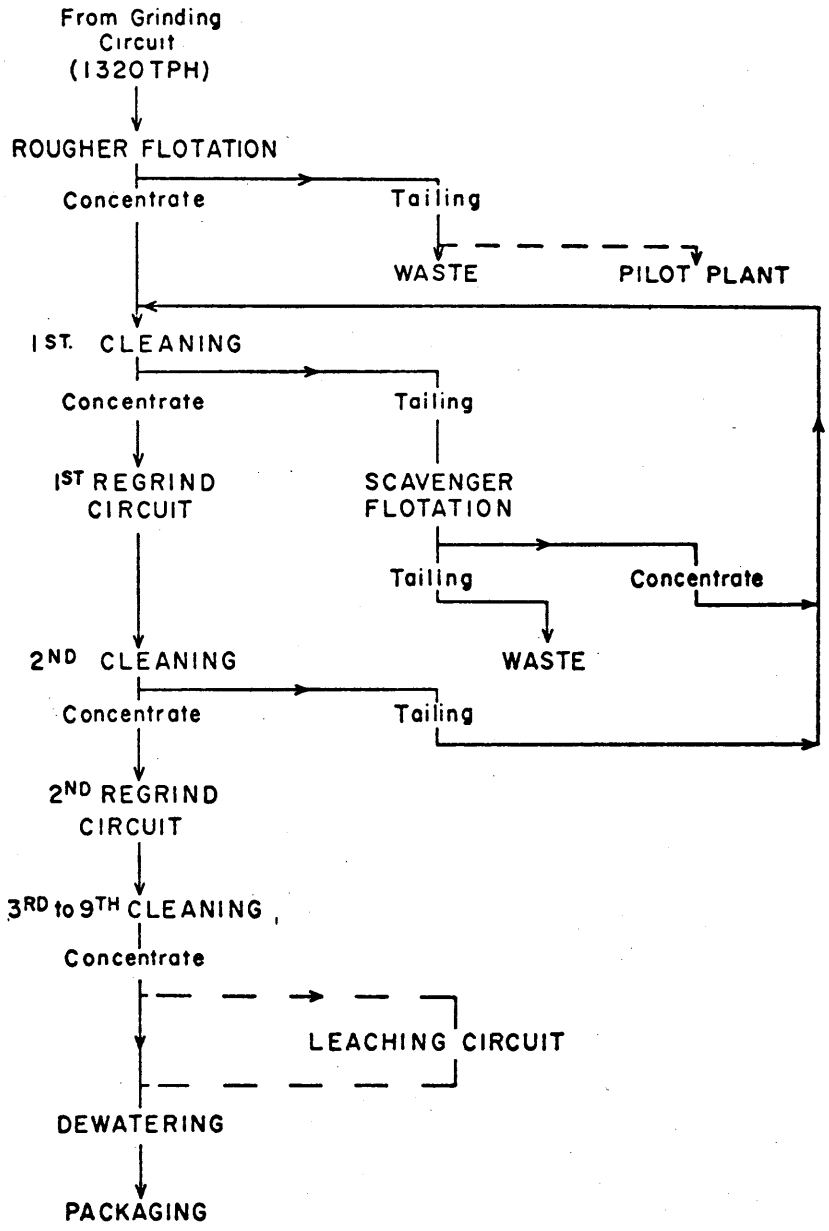
Topographically the area consists of subrounded mountains cut by broad drainage patterns. The Ruby Creek property lies above timber line in an area of limited rock exposures.

Ruby Creek drains into Surprise Lake which in turn drains into Atlin Lake. Atlin Lake forms part of the Yukon River system.

The pit area is at an elevation of 5000 feet, and the plant site is at 4500 feet, while the tailings dam is at approximately 4100 feet. Mountain tops in the immediate area rise to about the 6000 foot range.

PROPOSED FLOWSHEET — 15,000 TPD PLANT





CLIMATE

The Ruby Creek area lies east of the Coast Range Mountains and within a zone generally described as having an interior-type climate. The winters are severe, and the summer months are cool, enhanced by the long hours of daylight; during June and July, daylight lasts for 19 and 18 hours respectively.

Precipitation is variable, with about half falling as rain during the summer months. Observations over the past two years indicate that the mine area tends to have considerably more cool damp days during the summer months than does the Atlin townsite.

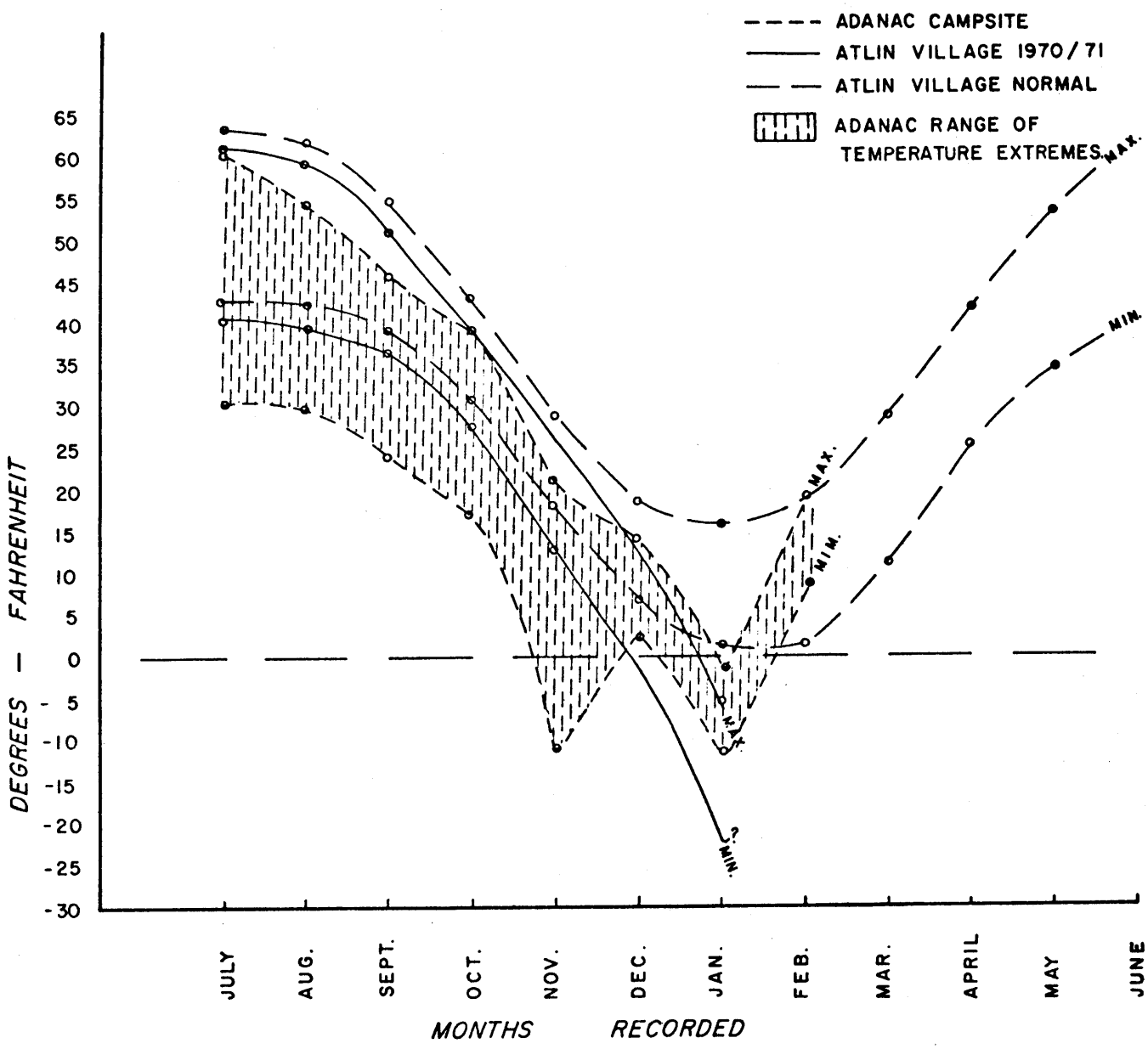
June, July and August are the warmest months of the year. They are characterized by unsettled weather with frequent light rain. The average daily temperature during July 1970, the warmest month, was only 45° F. Freezing temperatures and snow falls can be expected at any time during the summer in the mine area.

In winter extreme cold as low as -50° is not unusual. The mean average temperature during January of 1971 was approximately -5° F. Strong winds are not uncommon and accumulated snow generally amounts to an average of 4 or 5 feet before spring melting occurs.

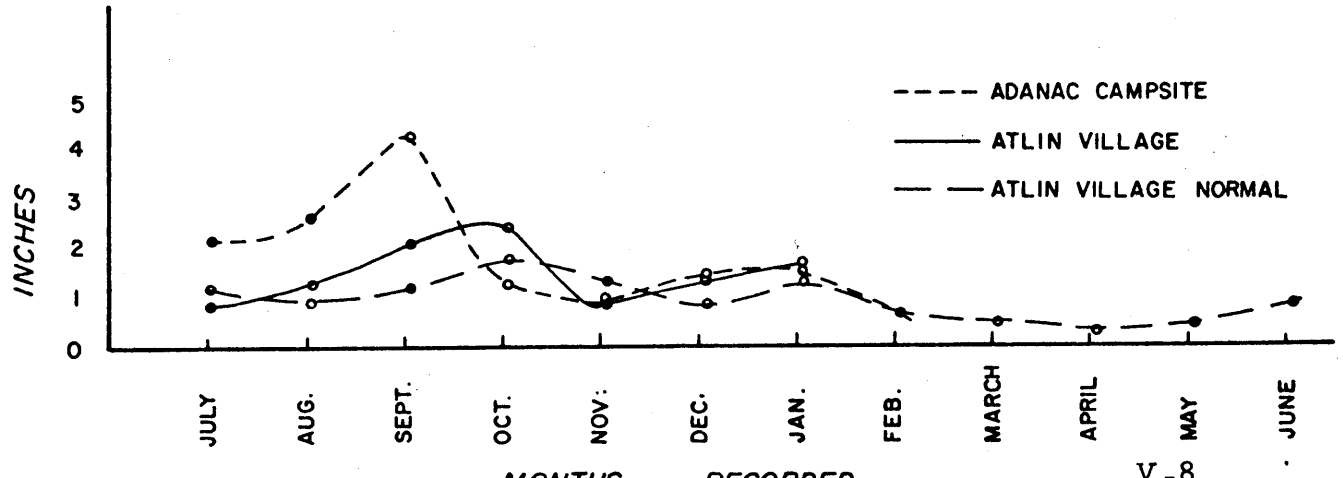
Graphs showing comparative temperatures over the past several months for both the mine site and Atlin are included on the following pages. As indicated on the graphs and as noted during the past two summers, the vicinity of Atlin is a much more pleasant location for a townsite than is the mine site area.

The mine site data shown on the graphs is obtained from meteorological instrumentation which was set up at the Adanac camp by Howard Paish & Associates on July 4th, 1970.

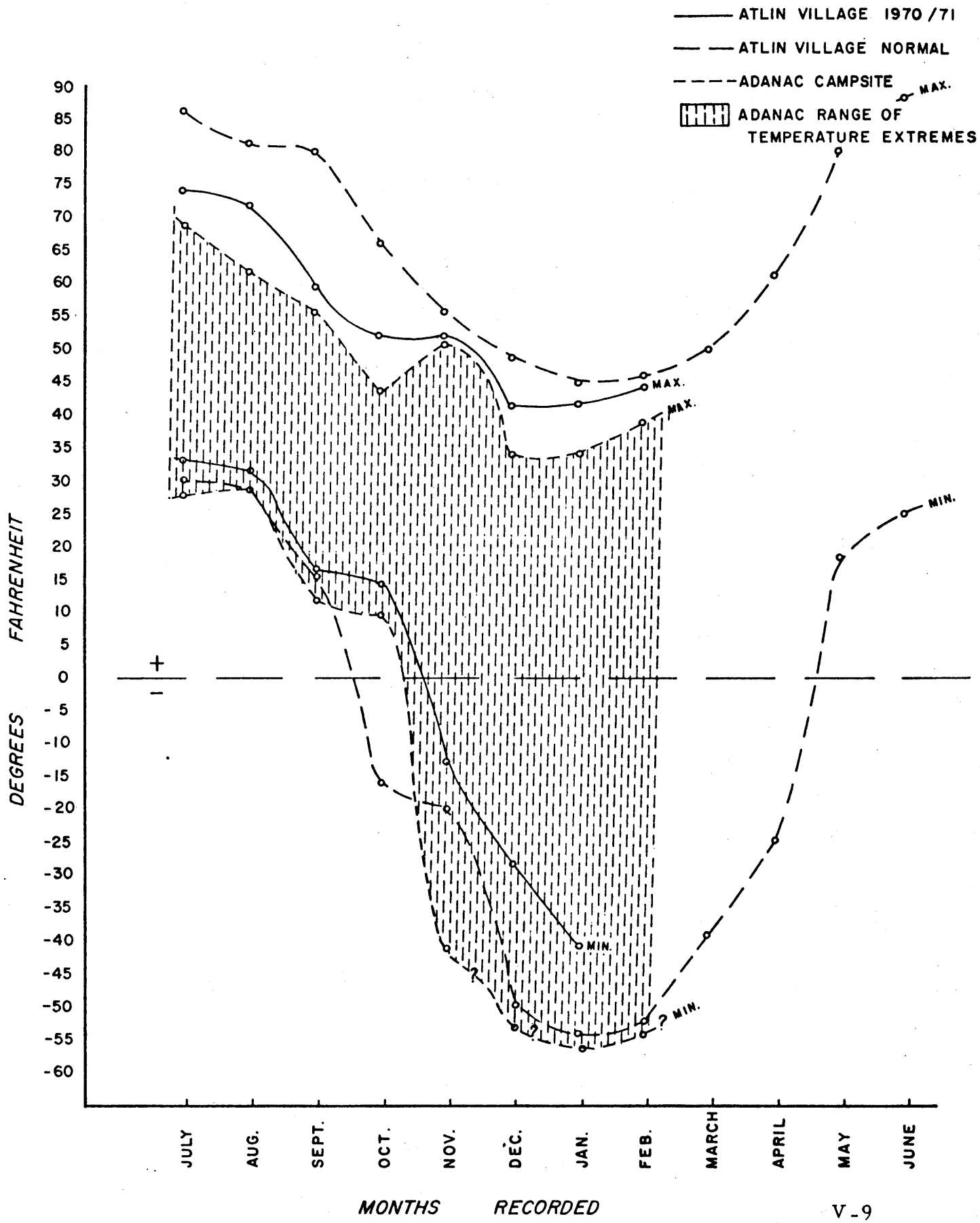
MEAN MAXIMUM & MINIMUM TEMPERATURES
FROM JULY 1970 TO FEBUARY 1971



PRECIPITATION (Rain or equivalent)
JULY 1970 TO FEBUARY 1971



TEMPERATURE EXTREMES
JULY 1970 TO FEBUARY 1971



ECOLOGY

A. Studies have been undertaken by Howard Paish & Associates Ltd., environmental and resource management consultants, to make a preliminary assessment of the environmental and ecological implications of the development of the Adanac property at Ruby Creek near Atlin, B.C.

The major purpose of the baseline study was to provide accurate data on the condition of the region prior to any planned changes. The baseline study included information on physiography, climate, hydrology, vegetation, fisheries and wildlife in the area likely to be affected by the project. Supplementary to this, on-going studies were conducted during the pilot mill operation for comparison with some of the baseline information primarily to determine the environmental implications of waste discharges from the pilot mill. Details of the ongoing studies appear in Section VI, Volume II.

Such information is necessary to meet the requirements of Provincial regulations in the planning of waste disposal facilities, and to ensure that detrimental effects on the environment are avoided.

B. The baseline study provided the following information:

1. The principal physiographic features of the Ruby Creek watershed include slope, orientation, and overburden. The steep slopes on some faces suggest the possibility of snow and mud slides creating road obstacles. Because of high glacial till porosity, water supplies are irregular while sewage and tailings pond seepages will present control problems.

2. A complete meteorologic station has been installed at the mine site and data collection methods have been reviewed. Some of the records were analyzed on the basis of a partial monthly summary included as a report supplement.

3. A general assessment of the alpine plant community plus a more specific vegetation transect near the mine site provided information on the main trees and shrubs, grasses, sedges and flowering plants in the area. It was found that there is no timber of commercial value in the watershed, but more important, that re-invasion of plant species on disturbed areas will be extremely slow. Therefore, vegetative disturbances should be kept to an absolute minimum.

4. The principal wildlife species of the Northern Alplands and Boreal Forest Areas are listed, along with specific references to field observations near the mine site. The prime factors contributing to the fragility of these Biotic Areas are discussed, particularly in relation to the influx of people and roads as part of mine development.

5. A general description of the hydrological and biological relationships of Ruby Creek to the Yukon basin is provided. Physical and chemical tests on Ruby Creek, Surprise Lake and Boulder Creek (control) include stream flow, water depth, temperature, clarity and turbidity, total hardness, sieve analysis, pH, total dissolved solids, dissolved oxygen, total alkalinity and spectrographic analysis. The biological survey of Surprise Lake consisted of fish and plankton sampling; Arctic Grayling is abundant in the lake, with the greatest concentrations near Creek mouths.

6. A discussion on general regional resource development and environmental considerations suggests that the major resource activity of the area is a relatively lightly exploited tourist industry which could grow considerably with the influx of mining activities. Such an impact could have a substantial detrimental effect on the ecological integrity of the relatively fragile environment of the north, unless human activity is carefully planned and controlled. The operations of Adanac should be thought of within a regional context with the actual location of a mine townsite as close as possible to Atlin.

C. The report concludes:

1. That if reasonable care is exercised, the actual physical impact of the planned operation can be confined to a very limited area.

2. The physiographic and topographic features of the area lend themselves to the planning of a sound waste disposal system.

3. Improved access and human pressures will likely have a greater effect on the unique fish and wildlife of the region than the actual physical operation of the mine.

D. The report recommends:

1. That the information from the studies be borne in mind by the Company and other consultants in planning further physical development, particularly where land disturbance is involved.

2. That liaison be maintained between consultants to ensure the upkeep of environmental quality if major development is decided upon.

3. That every effort be made to incorporate any townsite development with the existing community of Atlin.

4. That the information in the report be used in application for permits to comply with B.C. Mining and Pollution Control regulations.

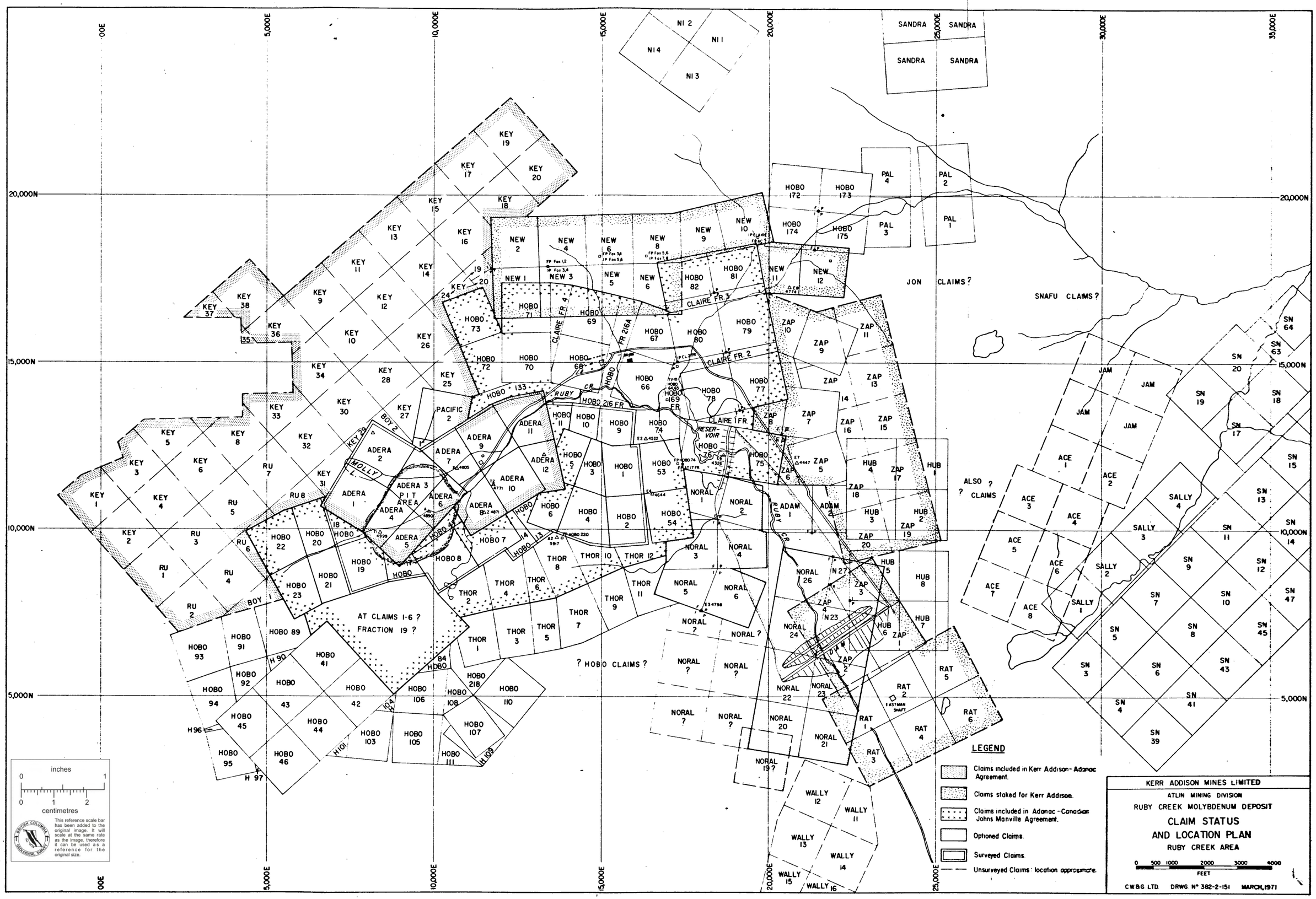
CLAIM STATUS

Under the Adanac agreement Kerr Addison Mines Ltd. currently hold a total of 188 claims in the immediate Ruby Creek area. This number includes 11 fraction claims.

The claims have been obtained from various sources. A breakdown of those sources is as follows:

Claims staked by Adanac and included in the Kerr Addison - Adanac Agreement	68
Claims staked for Kerr Addison	38
Adanac - Canadian Johns-Manville Agreement	66
Optioned from Others	16
Total claims held by Kerr Addison	188

A plan showing the general location of the claims is included on the following page and a complete list of the claims with their names, record numbers and expiry dates is found on pages V-14 and 15 of this section.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PACIFIC 2
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BRITISH COLUMBIA GEOLOGICAL SURVEY
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LEGEND
Claims included in Kerr Addison-Adanac Agreement.
Claims staked for Kerr Addison.
Claims included in Adanac-Canadian Johns Manville Agreement.
Optioned Claims.
Surveyed Claims.
Unsurveyed Claims: location approximate.
KERR ADDISON MINES LIMITED
ATLIN MINING DIVISION
RUBY CREEK MOLYBDENUM DEPOSIT
CLAIM STATUS
AND LOCATION PLAN
RUBY CREEK AREA
0 500 1000 2000 3000 4000
FEET
CWBG LTD. DRWG N° 382-2-151 MARCH, 1971

CLAIMS HELD BY KERR ADDISON MINES LTD IN THE IMMEDIATE RUBY CREEK AREA

As reported by E.C. Jacka, Mining Claims Controller, Kerr Addison Mines Ltd.

CLAIMS INCLUDED IN KERR ADDISON - ADANAC AGREEMENT

Name		Record Number			Expiry Date	
Adera	1 - 6	8101	-	8106	February 14th	1980
Adera	7 - 12	8107	-	8112	February 14th	1978
Pacific	1 - 2	8278	-	8279	July 25th	1978
Key	1 - 18	8765	-	8782	April 10th	1978
Key	19 - 20	8783	-	8784	April 10th	1978
Key	21 - 28	8827	-	8834	April 10th	1978
Key	29 - 32	8835	-	8838	April 10th	1980
Key	33 - 38	8839	-	8844	April 10th	1978
Key	39 - 44	8845	-	8850	April 10th	1980
Boy	1 - 2	13210H	-	13211H	July 25th	1978
Ru	1 - 8	8280	-	8287	July 26th	1980

C.J.M. Claims *

CLAIMS STAKED FOR KERR ADDISON

Zap	1 - 20	14911D	-	14930D	April 9th	1972
New	1 - 12	15818N	-	15829N	October 19th	1971
Rat	1 - 6	16108R	-	16113R	December 17th	1971

CLAIMS INCLUDED IN ADANAC - CANADIAN JOHNS MANVILLE AGREEMENT

Hobo	1 - 8	8423	-	8430	September 15th	1981
Hobo	9 - 10	8455	-	8456	October 4th	1981
Hobo	11	8457			October 4th	1980
Hobo	13 - 14	8459	-	8460	October 4th	1980
Hobo	17 - 19	8696	-	8698	April 8th	1981
Hobo	20 - 23	8699	-	8702	April 8th	1979
Hobo	47	8726			April 8th	1979
Hobo	48	8727			April 8th	1978
Hobo	53 - 54	8680	-	8681	April 1st	1978
Hobo	66	9108			July 10th	1978
Hobo	67	9109			July 10th	1975
Hobo	68	9110			July 10th	1978
Hobo	69	9111			July 10th	1975
Hobo	70	9112			July 10th	1978
Hobo	71	9113			July 10th	1974
Hobo	72	9114			July 10th	1976
Hobo	73	9115			July 10th	1974
Hobo	74 - 75	8756	-	8757	April 11th	1977
Hobo	76	8758			April 11th	1978
Hobo	77 - 82	8759	-	8764	April 11th	1977

*Kerr Addison - Adanac Agreement also includes all claims from the Adanac - C.J.M Agreement.

Claims included in Adanac - Canadian Johns-Manville Agreement cont'd

Name		Record Number			Expiry Date	
Hobo	72	9114			July 10th	1976
Hobo	73	9115			July 10th	1974
Hobo	74 - 75	8756	-	8757	April 11th	1977
Hobo	76	8758			April 11th	1978
Hobo	77 - 82	8759	-	8764	April 11th	1977
Hobo	87	8965			June 19th	1975
Hobo	89	8967			June 19th	1975
Hobo	133 Fr.	9730M			September 26th	1978
Hobo	169 Fr	10104D			November 13th	1977
Hobo	216 Fr.	10484B			February 10th	1976
Hobo	216 A Fr.	15259G			June 30th	1972
Hobo	219 - 220 Fr	12880H	-	12881H	July 2nd	1976
Thor	2	9012			June 6th	1981
Thor	4	9014			June 6th	1981
Thor	6	9016			June 6th	1981
Thor	8	9018			June 6th	1981
Thor	10	9020			June 26th	1982
Thor	12	9022			June 26th	1975
Claire	1 - 2 Frs.	13290K	-	13291K	August 6th	1977
Claire	3 Fr.	13292K			August 15th	1975
Claire	4 Fr.	13369K			August 15th	1976
At	1 - 6	14607	-	14612 (O)	March 2nd	1974
At	19 Fr.	14624 (O)			March 2nd	1974

CLAIMS OPTIONED FROM RON WONDGA, VAL SCHECK AND AL HEILAND

Noral	1 - 6	9722M	-	9727M	September 25th	1971
Noral	19 - 20	10030N	-	10031N	October 25th	1971
Noral	20 - 27	10058N	-	10065N	October 25th	1971