NEW WORLD MINES DEVELOPMENT LTD.
#307-525 SEYMOUR ST., VANCOUVER, BC V6B-3H7
C A N A D A

017957

Property File

103H 073

LIMESTONE DEPOSIT

KUMEALON LAGOON (53° 53', 129° 59')

GRENVILLE CHANNEL

SOUTHEAST OF PRINCE RUPERT, BRITISH COLUMBIA

Prepared by:

Felix A. Reyes, A.Sc.T
Industrial Minerals Consultant

April 23, 1985

Applied Science Technologists and Technicians of British Columbia
1702
Felix A. Reyes
A.Sc.T.

Telephone: (604) 684-7544
Fax: 662-7934, Telex:04-54654

TABLE OF CONTENTS:

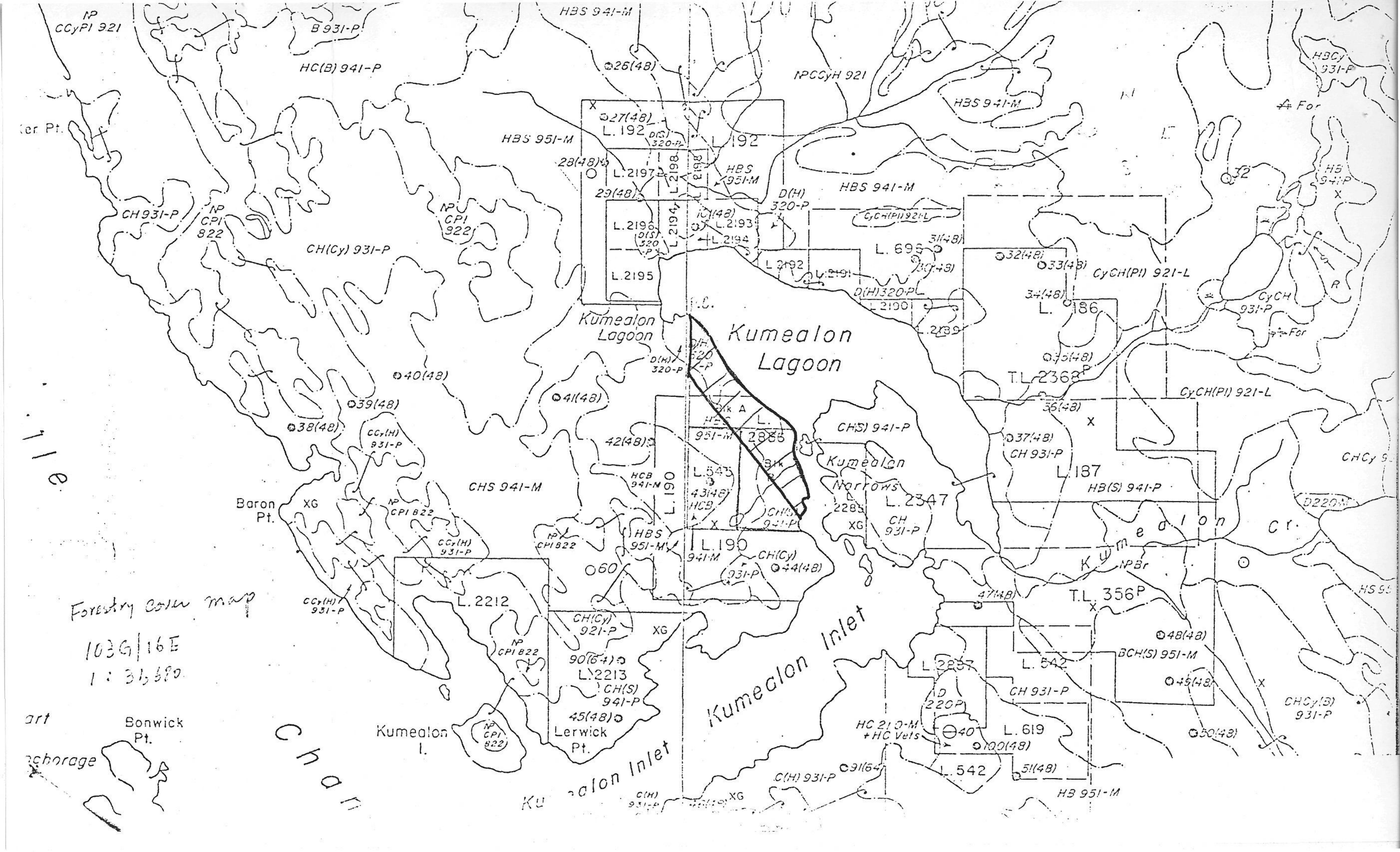

Kumealon Lagoon
Kumealon Narrows
Kumealon Inlet
Kumealon Cr.
Kumealon I.
Baron Pt.
Bonwick Pt.
Lerwick Pt.
L. 192
L. 2197
L. 2196
L. 2195
L. 2193
L. 2194
L. 2192
L. 2191
L. 2190
L. 2189
L. 698
L. 186
T.L. 2368P
L. 187
L. 2347
L. 2886
L. 543
L. 190
L. 2212
L. 2213
T.L. 356P
L. 542
L. 619
HBS 941-M
HBS 951-M
HC(B) 941-P
CH(Cy) 931-P
CHS 941-M
CH 931-P
CyCH(Pl) 921-L
HB(S) 941-P
BCH(S) 951-M
HB 951-M
XG
Forestry cover map
103G/16E
1 : 31,680

TABLE OF CONTENTS

Head Office: 1027 EAST 29th AVENUE, VANCOUVER, B.C., CANADA V5V 2S5 TELEPHONE (604) 874-4374

TOPOGRAPHY AND VEGETATION

The area is one of knobby hills up to 200 feet above the water, elongated parallel to the strike of the beds. There are steep-sided, 100 foot high hills facing the Lagoon, and inland are local sink holes where streams disappear under the bedrock.

Heavy stands of timber are present and moss and shrubs are common.

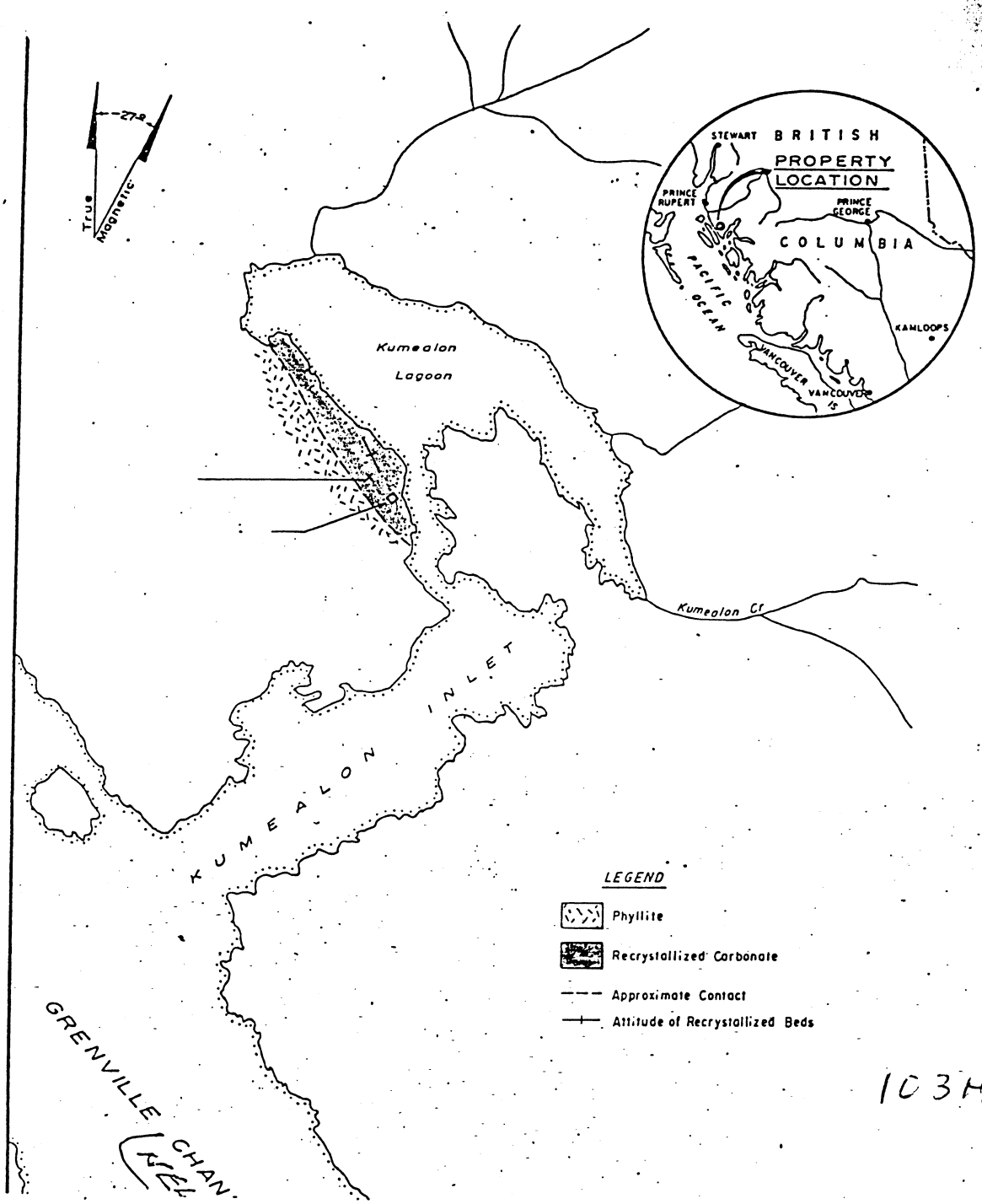
CLIMATE

Although rainfall is heavy in this region, there would be no climatic conditions which would prevent a year round mining or quarrying operation

HISTORY OF PROPERTY

C.D. Boun of Columbia Cellulose carried out some sampling on the limestone probably during the summer of 1958 for Columbia Cellulose. There are photostat copies of the reported results obtained indicating a good grade limestone suitable for mill usage.

M.F. Goudge, Limestones of Canada, Part V, Western Canada G.S.C., pps 174-176, reports a 500 foot thick section striking N60^{O}W and dipping 55^{O} southwest to vertical. Two samples were taken near the north edge of the deposit (#36) and one north of #36(#36A). #36 is described as "blue, fine grained limestone over 60 feet"(true thickness?) and #36A, "white, coarse-grained limestone over 90 feet(again implied true thickness).


27½
True
Magnetic
STEWART
BRITISH
PROPERTY
LOCATION
PRINCE RUPERT
PRINCE GEORGE
COLUMBIA
PACIFIC OCEAN
KAMLOOPS
VANCOUVER
VANCOUVER IS.
Kumealon
Lagoon
Kumealon Cr
KUMEALON INLET
GRENVILLE CHANNEL
LEGEND
Phyllite
Recrystallized Carbonate
Approximate Contact
Attitude of Recrystallized Beds

103H/13W

	SiO_2	Fe_2O_3	$A/_2O_3$	$Ca_3(PO_4)_2$	$CaCO_3$	$MgCO_3$	Total
#36	7.12%	0.26%	0.30%	0.17%	85.57%	5.08%	98.50%
#36A	1.04%	0.14%	0.18%	0.09%	93.39%	4.34%	99.18%

	S	CaO	MgO	Ratio of CaO to MgO
#36	0.07%	48.01%	2.43%	20 : 1
#36A	0.04%	57.35%	2.07%	25 : 1

These two samples are from a section described by Goudge measuring 515 feet with 30 feet of interbedded mica schist.

Goudge also mentions a 200 feet section of relatively pure, white crystalline limestone on the east shore of the inlet where a small brook enters.

GENERAL GEOLOGY

The outcrops seen on the southwest side of Kumealon Lagoon consist of medium to coarse grained, white to blue to grey, pure to impure, grey weathering, petroliferous, recrystallized limestone with minor amounts of dolomitic lenses varying from one foot in width to very thin beds. These carbonate beds strike 330 degrees and dip from vertical to steeply southwest. A phyllitic schist lies to southwest and the contact relation of the limestone to the schist is probably conformable.

The carbonate sequence is estimated to average 600 feet in stratigraphic thickness and to be present for at least 4000 feet along strike.

DETAILED GEOLOGY AND SAMPLING

A quick measurement of three sections was made in the cave or adit from the northeast to the southwest. These three sections are not believed to be the best material available. (all rocks are recrystallized).

Section A	on the floor of the cave
4"	interlaminated dolomitic limestone and limestone
16"	1" & 2" dol: and limestone interbeds
3"	blue limestone
3"	dolomitic limestone
5"	grey limestone
20"	white limestone
3.5"	predominately dolomitic limestone
16"	white limestone
1.5"	dolomitic limestone
4"	white limestone with 1" of grey limestone
10"	dolomitic limestone
4.5"	blue limestone
5"	dolomitic limestone
4.5"	white limestone
100.0"	Total of Section A

Section B	southeast wall of cave; probably a few feet stratigraphically southwest of Section A
6"	dolomitic limestone
18"	interbedded dolomitic limestone and limestone
60"	grey limestone
8"	dolomitic limestone

Section B (continued)

96"	white limestone
188"	Total of Section B

Section C — northwest side of cave; very close to the stratigraphic continuation of Section B

84"	limestone with streaks of dolomitic material
15"	dolomite
26"	limestone
125"	Total of Section C

The results of a poorly taken chip sample(#435) over Section C above returned the following results:(#437 is a grab of the greyer, impurer material taken in an outcrop about 1000 feet north of the adit of cave)

Approximately 200 feet stratigraphically to the southwest there is a much better section of slightly dolomitic limestone outcropping along a stream bed which is approximately 60 feet in width.

The not authenticated work by Columbia Cellulose of 13 samples reported on in 1958 from a "vertical hole", from the cave and from surface exposures showed the following approximate averages:

Ignition loss	Calculated $CaCO_3$	Acid insoluble
43.50%	98%	1.30%

OBSERVATIONS

The dolomite is lens-like in nature along strike and other impurities seen were coarse, subhedral to euhedral, light green crystals of chrome tremolite(one locality only); fine grained, euhedral pyrite cubes, possibly garnet, and possibly some argillaceous material near the schists

As mentioned under "geology", the carbonate gives a petroliferous odour when struck by a hammer.

Limestone conglomerate and coarse, angular limestone breccia were seen close to the Lagoon.

The limestone has only one set of obvious fractures, strike N30^{o}E and close to vertical; these appear to control the drainage pattern.

Lateral continuity of individual limestone beds is not known; moss and overburden are extensive but probably not very thick.

ECONOMIC GEOLOGY

As with most industrial minerals or rock, often each consumer has individual chemical and physical specifications, and therefore an attempt has been made in this report to present varrying assays carried out on the limestone.

Based on a strike length of a minimum of 4000 feet, (the east side of the Inlet reported on by Goudge was not checked), a width of 600 feet and an average height above the water of 100 feet, there would be a minimum of 21,000,000 short tons of carbonate material present.

The topography would be an asset in maintaining an "open-end" for quarrying or mining. Roads are possible over most of the ground, and there is fresh water and ample timber available at the location. Shipping by barge is considered feasible from Kumealon Inlet.

Preliminary indications are that there is a large volume of high grade carbonate material present.

RECOMMENDATIONS

In accordance with the opinion formulated by WEL, a diamond drilling program should be carried out to bring some of the probable and possible geological reserves into the proven category, to test depth of weathering, the stratigraphy, grade consistency and various rock characteristics.

Concurrently with the exploration, bulk sampling and testing should be carried out to determine crushing and grinding parameters, drilling and blasting requirements and suitability for various end uses in accordance with U.S. and Canadian standards of testing of materials.

Thirdly, a market survey should also be carried out at the same time, extending to local, regional, national and international markets to establish current actual and projected demands for the potential products and byproducts discussed in the foregiong.

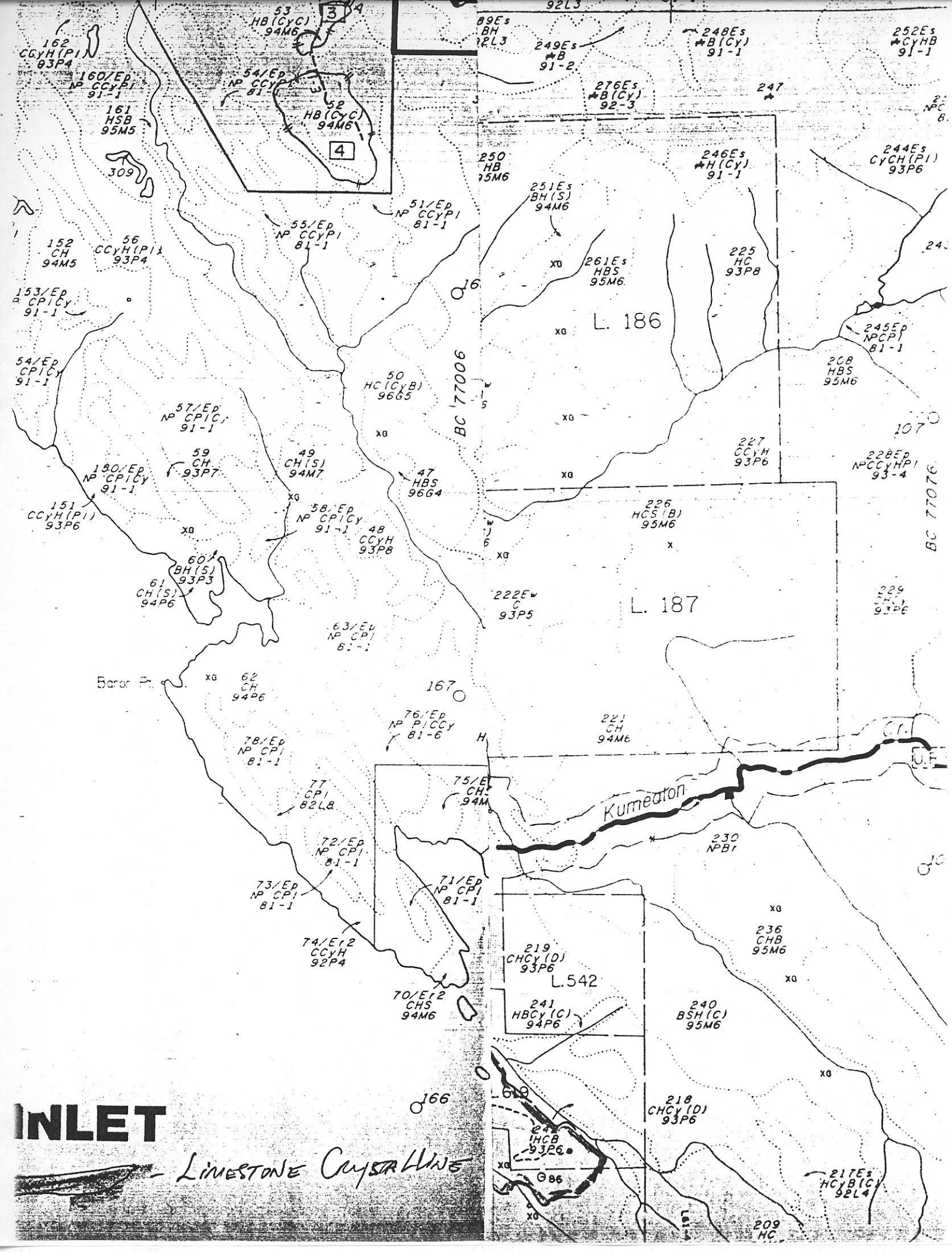
Consequently, the exploration drilling program should be governed by the results of the ongoing marketing activities, of the corresponding materials testing and of the objectives of establishing the optimal quarry layout and production parameters.

The order of magnitude costs to carry out the above are estimated as follows:

Diamond drilling and assaying 900 m at $103/m	$ 92,700
Trenching and bulk sampling	15,000
Geological field supervision	10,000
Market survey and forecasting	200,000
Advertising	50,000

Materials testing		25,000
Metallurgical tests		50,000
Preliminary feasibility studies		75,000
Subtotal	$	517,700
Contingencies - 10%		51,800
Total	$	569,500

The largest cost item is the allowance for marketing. This activity may be contracted out in two stages and in three areas: local, regional and national/international. In this way, upon favorable results in the first stage in one or more areas, the cost may be reduced by decreasing the scope of the second stage. Upon significant savings in marketing due to potential instant committments, additional drilling could be carried out in the area of initial quarry development to assure quality control.


L. 186
L. 187
L.542
BC 77006
BC 77076
Kumeaton
Baror Pt.
INLET
LIMESTONE CRYSTALLINE

4. STOCKPILE, RECLAIM:

Separate stockpile shall be maintained which shall be covered (shed) to maintain the product dry. The stockpile shall be 300 feet and 32 feet high is built up by Stacker Conveyor. Complete reclaim will be done by 980-C wheel loader.

5. SHIPLOADING AND OPEN BARGES:

The method of ship loading or barge loading shall be in the Kumealon port wharf with a 150 feet elevating conveyor at 36 inches belts discharging to the ship or barge at a rate of 300 ton per hour. The elevating conveyor has surge-bin feeder loaded by 980C loader for 24 hours/barge load at 4,000 tons.

All U.S. shipments shall be handled by U.S. flagship barge contracts tended with Alaska Marine Lines, Seattle, Washington etc., Foss Marine Lines, Seattle.

All Canadian shipments shall be handled by Canadian barges/ships contracts will be tended to Canada Lafarge Marine Division & backhaul for Rivtow Marine, and Yukon & White Pass Marine.

6. LIMESTONE PRODUCTS:

1. Commercial crude limestone product shall be 100% passing one inch minus. Minimum 10% dust (fines). Pre-screened grade shall be minimum 98% $CaCO_3$ with 3-4% moisture.

2. A lab technician shall maintain quality control on the crushing and screening plant.

7. WASTE PRODUCTS:

There will be no waste products.

QUARRYING METHODS

The white limestone deposit have been reviewed and the preliminary capital and operating expenditures for quarrying the deposits estimated.

Quarrying Procedure involves:

a. Vegetation clearing
b. Barren overburden removal
c. Ore removal
d. Overburden dumped in mined out areas after initial surface dumping.
e. Reclamation of mining land.

Parameters Used in the Cost Estimate

Ore zone depth	200 feet drilled
Overburden	0.5 feet
Ore zone	600 feet x 4000 feet long

Quarry will be performed in one 8-hour shift daily during the daylight hours. The work week will be five days. Annual working are 8 months. Production rate to be 50,000 tp a month = + 100,000 tonnes per year. Costs are in 1985 dollars.

Daily Requirements for Operations

From the above parameters, the following data has been derived:

Ore production	3200 tpd
Waste production	N I L
Clearing	2000 sq. yds.

Quarry Operations

The mining is to be by opencast methods employing a dozer for vegetation removal and ripping; fron end loaders and off highway trucks for transporting material to the crushing/screening plant and waste disposal. The average one-way haul distance for transporting ore to the crushing plant has been taken as 0.25 miles.

CALCULATION OF OPERATING COSTS

Equipment Requirements

Mobile Equipment: 2 loaders
2 trucks
1 dozer D-7 with ripper
1 excavator backhoe

Stationary Equipment: Truck and loader service building

Ripping Operation

The production capability of a Caterpillar D7 is 1500 tonnes/hour.
The daily requirement is 3000 tonnes of limestone rock.
Time required therefore, is 3000/500 = 6 hours.

The dozer has, therefore, time remaining for vegetation clearing and roadwork to build access road & fills.

Loading Operation

With an 84% availability, two front end loaders of 500 tonnes per hour loading capacity are required.

3000 tonnes/500 = 7.0 hours.

Hauling Operation

Assuming a truck capacity of 40 tonnes actual,
Loading time per truck: 40/500 x 60 = 4.8 minutes.
Haul time at an average speed of 45 mph = 44 ft/sec.
= 0.25 x 5280/44
= 300 sec = 5 minutes.
Dump time is 1 minute.
Therefore, total cycle time = 5 + 1 + 1 = 6 minutes.
Total per day (8 hours) = 40 x 8 x 5 = 1600 t/day.

Average owning and operating costs are:

Dozer and ripper	$74/hour
Front end loader	$55/hour
Off highway truck	$60/hour

Cost per 8 hour shift:

Dozer	74 x 8	=	$600
Loader	55 x 8 x 2	=	$880
Trucks	60 x 8 x 8	=	$3840
	Total		$5320

Cost/tonne ore quarried: 5320/1,500 tonnes = 3.54

Contingencies at 10% = $2.01

Engineering and supervision = $2.31

Calculation of Capital Expenditure Requirements

A service building to hour quarrying services of maintenance, warehousing, offices, and changehouse. Butler-type building of 12,500 sq. feet (250' x 50').

Cost of building and equipment (N.T.C. area) =

Mobile Equipment:	1 loader	($85,000)	= 85,000	(used)
	2 trucks	($75,000)	= 150,000	(used)
	1 dozer	($100,000)	= 100,000	(used) D-7
	1 grader	($56,000)	= 56,000	(used) D14E
		Sub total	= $391,000	
	Miscellaneous and Contingencies at 10%		= 84,100	
		Total Expenditure	= $475,100	
	Engineering & supervision (15%)		= 138,000	
		TOTAL	= $563,100	

Quarrying Summary

Capital Expenditure	= $563,100 CAD.
Operating Cost per tonne ore	= $0.85 per tonne

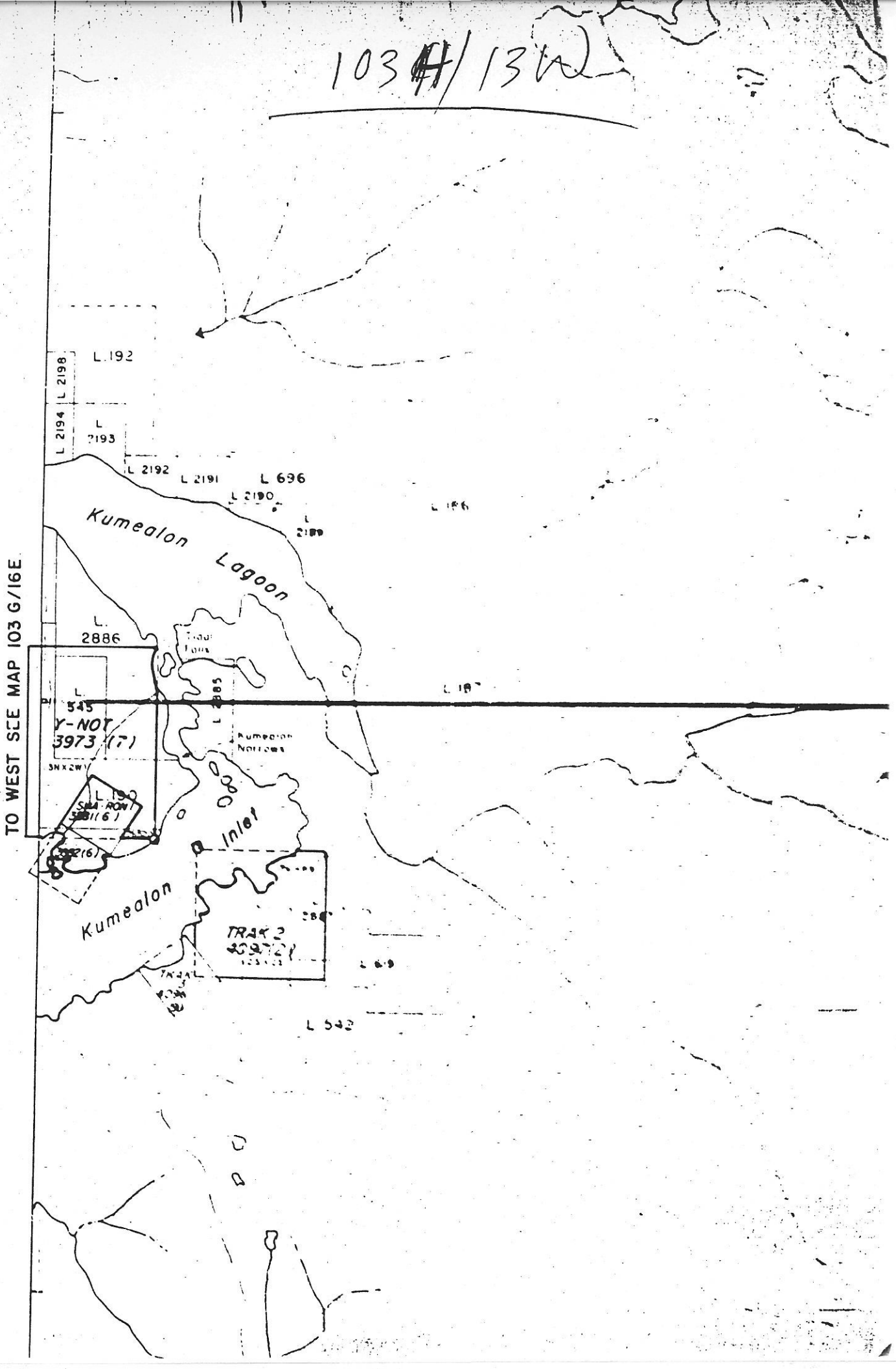
REFERENCES:

Mr. Gordon P.E. White, P.Geologist, Kamloops, B.C.

WEL - Wright Engineers Limited.

Columbia Celulose File, 1960.

V. APPENDICES.


103H/13W
L 192
L 2198
L 2194
L 2193
L 2192
L 2191
L 696
L 2190
Kumealon Lagoon
L 2886
L 545
Y-NOT 3973 (7)
Kumealon Narrows
Kumealon Inlet
TRACT 2
TRACT
L 542
TO WEST SEE MAP 103 G/16E