

MAMMOTH
GEOLOGICAL LTD.

LOG NO:	MAY 16 1995	U
ACTION:		
FILE NO:		

Box 5250, Port Hardy, B.C. V0N 2P0
Phone : (604) 949-5197

BOULDER TESTING PROGRAM
ON THE
M315 PROPERTY

Nanaimo Mining Division
Vancouver Island, B.C.

926/8W
50° 18' N
126° 23' W

FOR
MAMMOTH GEOLOGICAL LTD.

FILMED

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

23,892

By: R. Tim Henneberry, P. Geo.
April 30, 1995

SUMMARY

The intrusive rocks of the Island Intrusions at the north end of Vancouver Island have received little attention as a source of dimension stone in the past. These "granites" have the potential to provide both polished dimension stone and rough split structural stone. A literature research identified several areas within the Island Intrusions where a concentrated exploration program has an excellent chance of locating quarriable "granite" reserves, leading to an on-going regional exploration assessment program of the north Island plutons.

The principle area identified was the Vernon Batholith. The M315 property is one of a number of properties staked in the batholith, which at this location is a medium-grained, grey-white granodiorite. Preliminary mapping and sampling showed the stone takes a good polish, giving it potential as dimension stone, and also showed the stone splits easily along a distinct grain giving it potential as structural stone.

Initial prospecting during staking located a semi-continuous bench along the logging road bisecting the 315-1 claim. Prospecting also located several large 50 to 300 ton granite boulders along existing roads. These boulders were test quarried to assess the suitability of the stone for both structural stone and polished dimension stone.

The results to date are favorable for structural stone as the granodiorite can be readily split along grain for use as split faced granite. The numerous xenoliths within the granite severely restrict the use of this stone as polished dimension stone. The one area of relatively solid granite along the semi-continuous bench looks contain considerably fewer xenoliths and is considered a worthwhile target for a bulk test in the order of 1000 to 2000 tons. A second area on the M315-2 claim also appears to be relatively solid, but this would entail considerable expense to establish road access and is therefore not considered a target at this time.

At this stage, most of phase I and phase II of the standard three phase dimension stone exploration program, namely mapping and boulder testing, have been completed, though there are still one or two boulders left to test. The total cost to complete the remainder of the boulder testing program and undertake the bulk testing program is estimated at \$52,369.

The initial prospecting, mapping and boulder testing programs completed on the M315 property cost \$6,700.

TABLE OF CONTENTS

INTRODUCTION4
LOCATION, ACCESS6
CLAIM HOLDINGS8
REGIONAL GEOLOGY10
 Island Intrusions12
 Vernon Batholith12
1994 EXPLORATION PROGRAM14
 Property Mapping14
 Boulder Testing14
 Marketing15
DISCUSSION17
CONCLUSIONS AND RECOMMENDATIONS18
REFERENCES19
STATEMENT OF QUALIFICATIONS20
STATEMENT OF COST21
COST ESTIMATES22
SAMPLE DESCRIPTIONS23

LIST OF FIGURES

1. Property Location5
2. Claim Location7
3. Geology of Vancouver Island9
4. Vancouver Island Granite Vernon Batholith11
5. Property Geology13

INTRODUCTION

The purpose of this report is to document the mapping and boulder testing programs completed to date within the granodiorite on the M315 property. The property was initially staked and prospected on May 3, 1994. The prospecting located a semi-continuous bench outcrop along an existing logging road, as well as a large boulder of ± 75 tons along the mainline logging road. Subsequently, two additional contiguous claims were staked to cover a second ridge and several additional boulders.

The term granite is a generic term in the dimension stone industry used to describe any intrusive igneous rock. The stone on the M315 property is actually a granodiorite. The two terms are used interchangeably throughout this report.

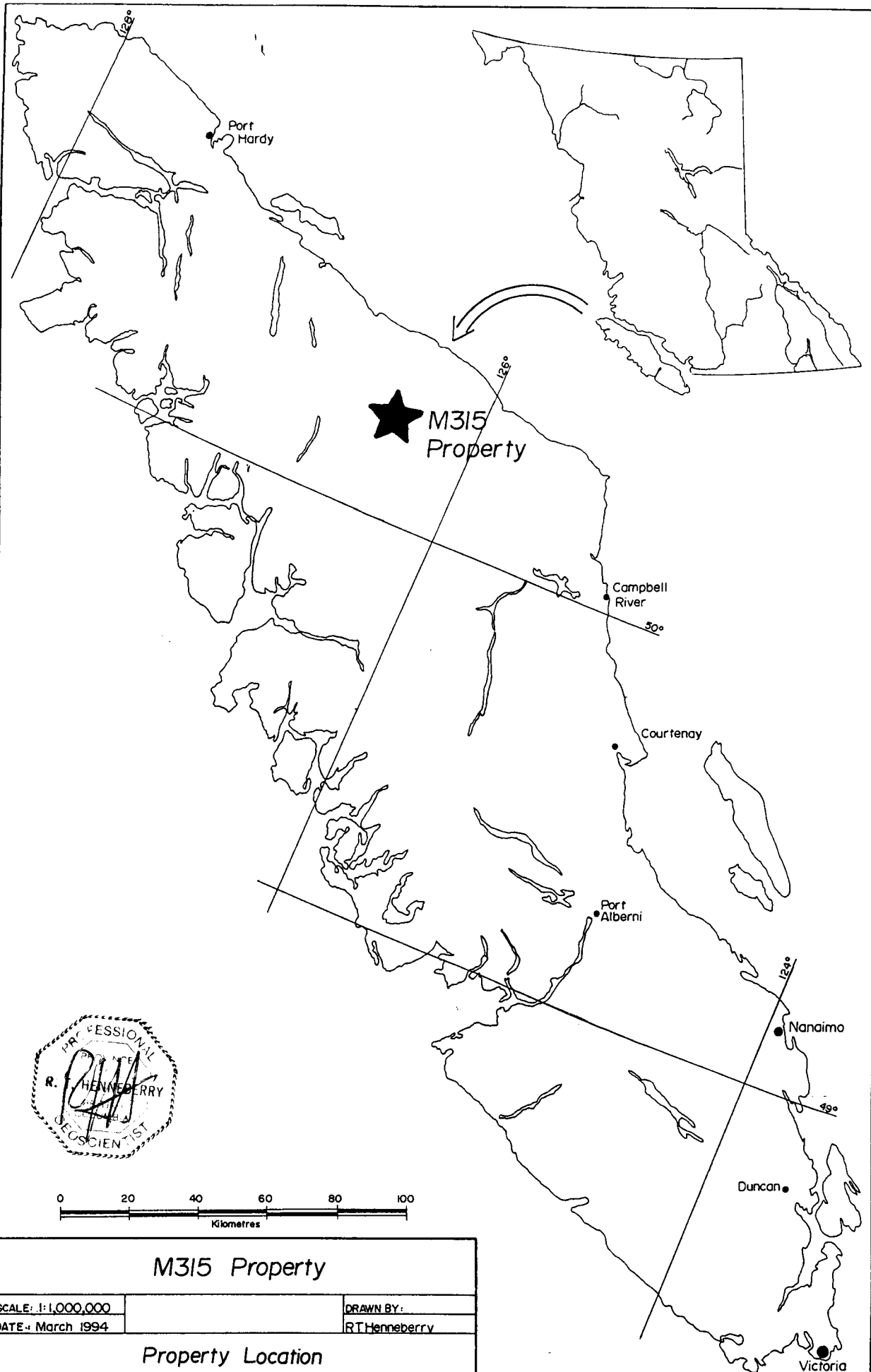
The M315 property was acquired as part of a regional exploration program and assessment of the dimension stone potential of the north end of Vancouver Island. The goal of the program is to establish a marble, granite and andesite quarrying operation supplying blocks for both polished and structural dimension stone (Henneberry, 1992; 1994; 1995).

The standard exploration program for each of these dimension stone properties consists of prospecting and mapping followed by small scale quarry testing of boulders, finally followed by a large scale bulk test of the identified quarry site.

The granites on the north Island seem to regularly yield large 100-1000 ton boulders, ideal sites to complete small scale tests of the stone for both polished and structural stone. These boulder testing programs of small scale test quarrying, combined with marketing tests, yield a good assessment of the stone potential of each property.

The boulder testing programs entail the actual quarrying of a few of the boulders into 5-20 ton blocks. These blocks are then supplied to local processors for completion of market tests. At least 500-1000 tons has to be supplied to allow the stone to be tested in the market place, which essentially means the stone is used on a few jobs sites, especially for structural stone.

The final phase involves actual test quarrying of 1000-2000 tons from the planned quarry site to establish the consistency of color, texture and structure. This stone will again be put into the market place to complete marketing analysis, before a final production decision is made.



M315 Property	
SCALE: 1:1,000,000	DRAWN BY:
DATE: March 1994	RT Henneberry
Property Location	
Mammoth Geological Ltd.	DRAWING NUMBER 1.

LOCATION, ACCESS

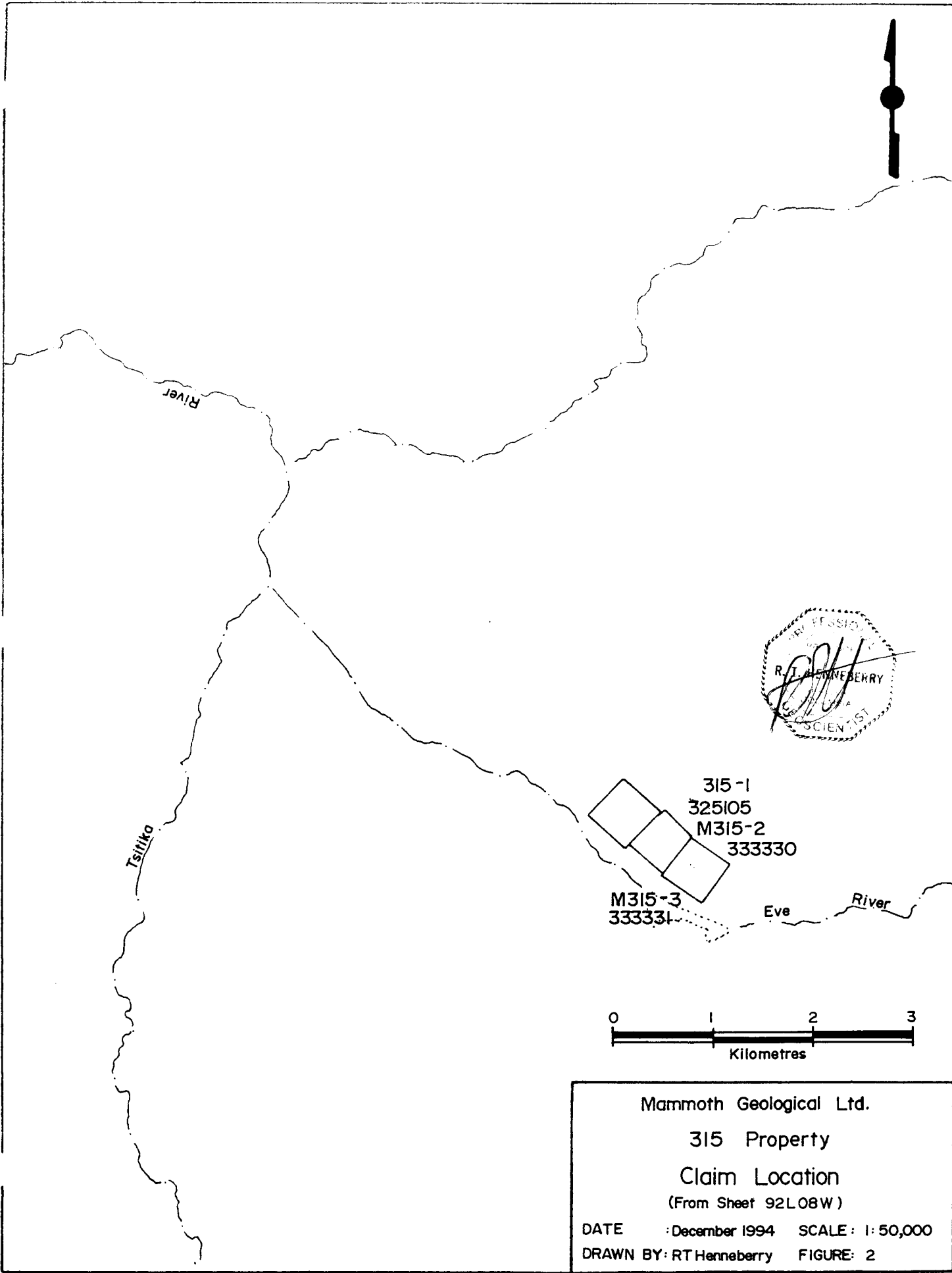
The area of interest is the northern section of Vancouver Island, between latitudes $49^{\circ} 45'$ and $50^{\circ} 45'$ and longitudes $126^{\circ} 30'$ and $127^{\circ} 55'$. Topography ranges from Sea Level to 1050 metres, with valleys generally less than 300 metres. There are numerous lakes, creeks and streams where water for diamond drilling is readily obtainable. Heavy duty equipment for trenching and road-building will be accessible locally, in either Port Hardy or Port McNeill.

The climate on the north island is relatively mild. The summers are warm and generally dry, while the winters are cool and wet. Snow will accumulate on the higher peaks, but generally the valley bottoms and lower hills are clear for year round work.

There are several towns and lesser communities in the map area where accommodation and lodging can be readily obtained, including Port Hardy, Port McNeill and Woss. The Island Highway cuts through much of the map area. The numerous logging roads of Canadian Forest Products, Fletcher Challenge Canada and Canadian Pacific Forest Products provide access to different claim groups.

The M315 property lies on NTS Sheet 92L/08W, 17 kilometres northeast of Woss. Access is 18 kilometres east of Woss along the Island Highway to logging road MK Main, then 500 metres north to North Main, then 1 kilometre east along the North Main to the property. The status of the property is immature second growth.

This property is at the highest point on the Island Highway and can be susceptible to snowfall accumulations from mid-October to mid-February.



Mammoth Geological Ltd.

315 Property

Claim Location

(From Sheet 92L08W)

DATE : December 1994 SCALE : 1: 50,000

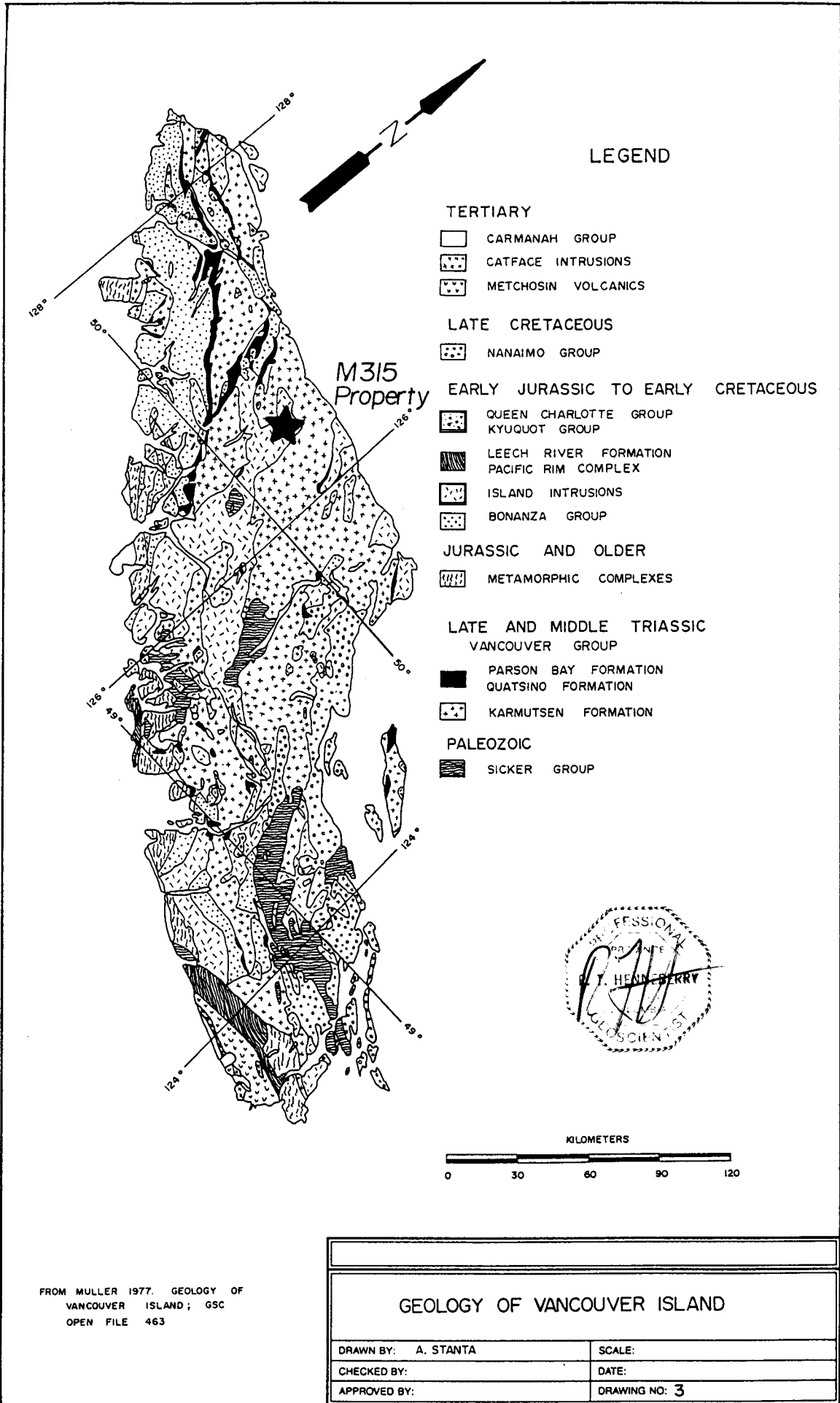
DRAWN BY: RT Henneberry FIGURE: 2

CLAIM OWNERSHIP

The M315 property consists of 3 two-post mineral claims encompassing an area 1.5 kilometre by 0.5 kilometre. The property parallels the North Main logging road and covers a series of readily accessible boulders, along with two bench or knob outcrops.

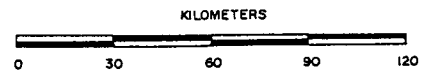
Claim	Record Number	Anniversary Date
315-1	325105	May 3, 1995
M315-2	333330	December 27, 1995
M315-3	333331	December 27, 1995

The registered owner is R. Tim Henneberry of Port Hardy, B.C.



FROM MULLER 1977. GEOLOGY OF VANCOUVER ISLAND; GSC OPEN FILE 463

GEOLOGY OF VANCOUVER ISLAND	
DRAWN BY: A. STANTA	SCALE:
CHECKED BY:	DATE:
APPROVED BY:	DRAWING NO: 3



REGIONAL GEOLOGY

The geology of the north end of Vancouver Island has been described by Muller et al (1974) and Muller et al (1980). The area lies in the Insular Belt of the Canadian Cordillera. The map area is chiefly underlain by the middle to upper Triassic Vancouver Group, overlain by the lower Jurassic Bonanza Group. The Vancouver Group is intruded by large and small bodies of middle Jurassic Island Intrusions and the related (?) Westcoast Complex, and overlain unconformably by remnants of a lower Cretaceous clastic wedge on the southwest side and similar upper Cretaceous beds on the northwest side of Vancouver Island. There are some small early Tertiary (Catface) intrusions also mapped. The region may be divided into several great structural blocks, separated mainly by important near-vertical faults and themselves fractured into many small fault segments.

The Vancouver Group is comprised of the lower Karmutsen Formation, middle Quatsino Formation and upper Parson Bay Formation. The Karmutsen Formation, the thickest and most widespread of the Vancouver Group formations, consists of basaltic pillow lavas, pillow breccias and lava flows with minor interbedded limestones, primarily in the upper part of the formation. Karmutsen rocks outcrop throughout the north part of Vancouver Island, primarily on the east side.

The Quatsino Formation overlies the basalts. The lower part of the Quatsino Formation consists of thick bedded to massive, brown-grey to light grey, grey to white weathering, fine to microcrystalline, commonly stylonitic limestone. The upper part is thin to thick bedded, darker brown and grey limestone, with fairly common layers of shell debris. The formation is in gradational contact with the overlying Parson Bay Formation by an increase in layers of calcareous pelites. Quatsino limestone outcrops as three narrow belts on the north part of Vancouver Island.

The Parson Bay Formation consists of a series of interbedded silty limestones and calcareous shales and sandstones, and occasional beds of pure limestone. Parson Bay rocks outcrop sporadically overlying the Quatsino limestone.

The Bonanza Group overlies the Vancouver Group. Bonanza Group rocks are primarily a Jurassic assemblage of interbedded lava, breccia and tuff with compositions ranging from basalt through andesite and dacite to rhyolite, deposited in a volcanic island arc environment. The Bonanza Group outcrop primarily on the west side of northern Vancouver Island.

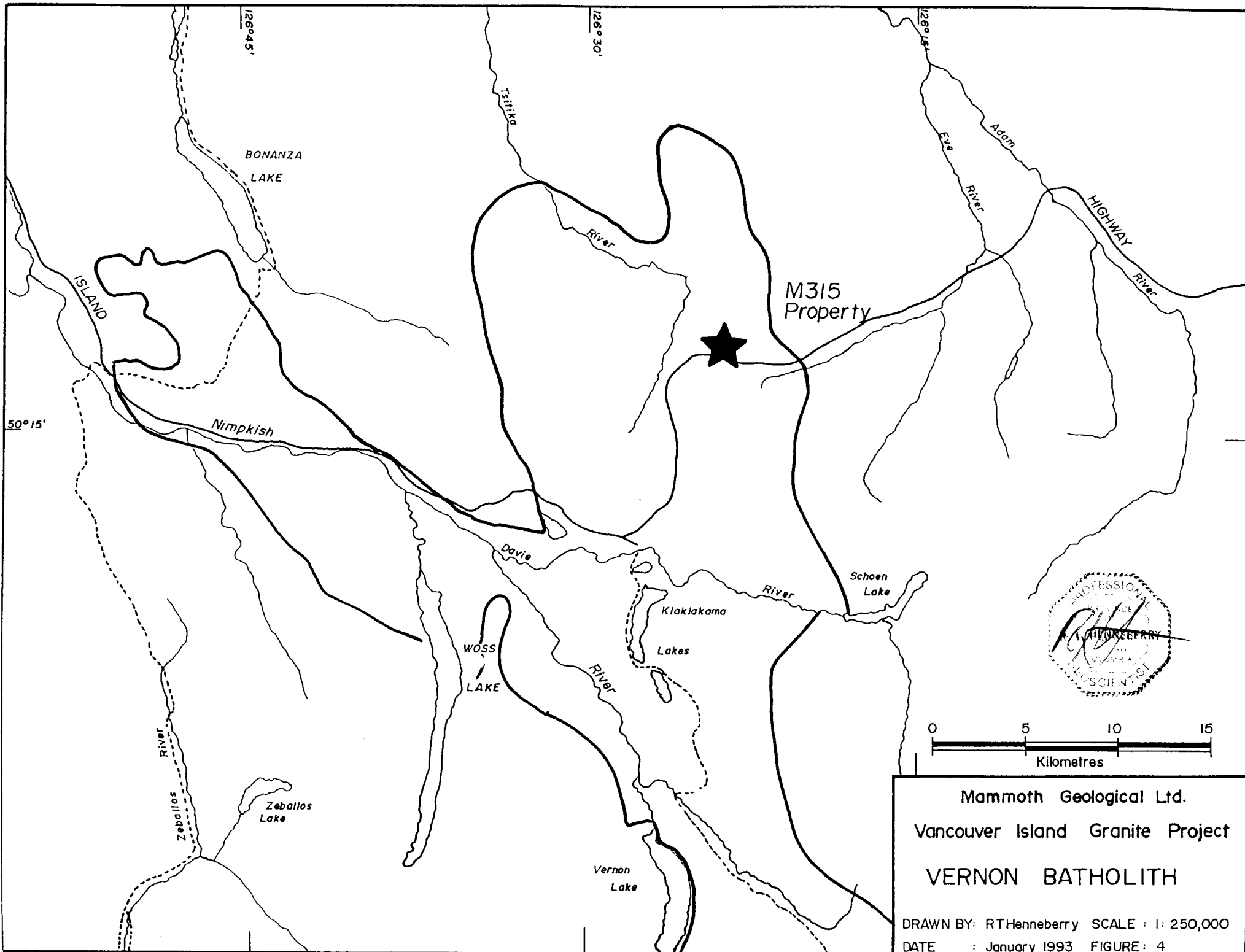
The Westcoast Complex is a heterogeneous assemblage of amphibolite and basic migmatite with minor metasedimentary and metavolcanic rocks of greenschist metamorphic grade. The Westcoast Complex outcrops in a loosely defined belt on the west coast of Vancouver Island.

Granitoid batholiths and stocks of the Island Intrusions underlie large parts of Vancouver Island. These intrusions range in composition from quartz diorite and tonalite to granodiorite and granite. Island Intrusions outcrop in a belt through the central section of Vancouver Island.

The Cretaceous clastic wedge includes the Queen Charlotte and Nanaimo Groups. These groups consist of cyclical successions of sandstone, conglomerate and shale, with interbedded coal in the Nanaimo Group. These rocks outcrop around Quatsino Sound.

Small intrusive stocks of early Tertiary age and of general quartz dioritic composition are known in many parts of Vancouver Island. These rocks are generally massive, light colored, fine to medium grained equigranular to locally porphyritic granitoid rocks. They are commonly regularly and closely jointed.

The network of faults displayed on the north end of Vancouver Island appears to be the super position of two or more fracture patterns, each with a characteristic directions and of different age and origin.



Mammoth Geological Ltd.
 Vancouver Island Granite Project
VERNON BATHOLITH
 DRAWN BY: RTHenneberry SCALE : 1 : 250,000
 DATE : January 1993 FIGURE : 4

Island Intrusions

The intrusive rocks of the Island Intrusions at the north end of Vancouver Island have received little attention as a source of dimension stone in the past. These "granites" have the potential to provide dimension stone "granite" for use as facings (vener) and tiles. A literature research identified several areas within the Island Intrusions where a concentrated exploration program has an excellent chance of locating quarriable "granite" reserves.

The Jurassic Island Intrusions underlie much of the central core of Vancouver Island. The Island Intrusions have invaded all Vancouver Group rocks and are elongated in a northwesterly direction. (Muller, 1977). The Intrusions vary in composition from leuco-quartz monzonite to gabbro, but the majority are granodiorite and quartz diorite. Small high-level bodies and cores of the larger bodies contain leuco-granodiorite and quartz monzonite, and deeper and marginal parts contain diorite and gabbro. Muller et al (1974) and Muller et al (1981) have divided the Island Intrusions of northern Vancouver Island into several distinct zones, based on location and composition.

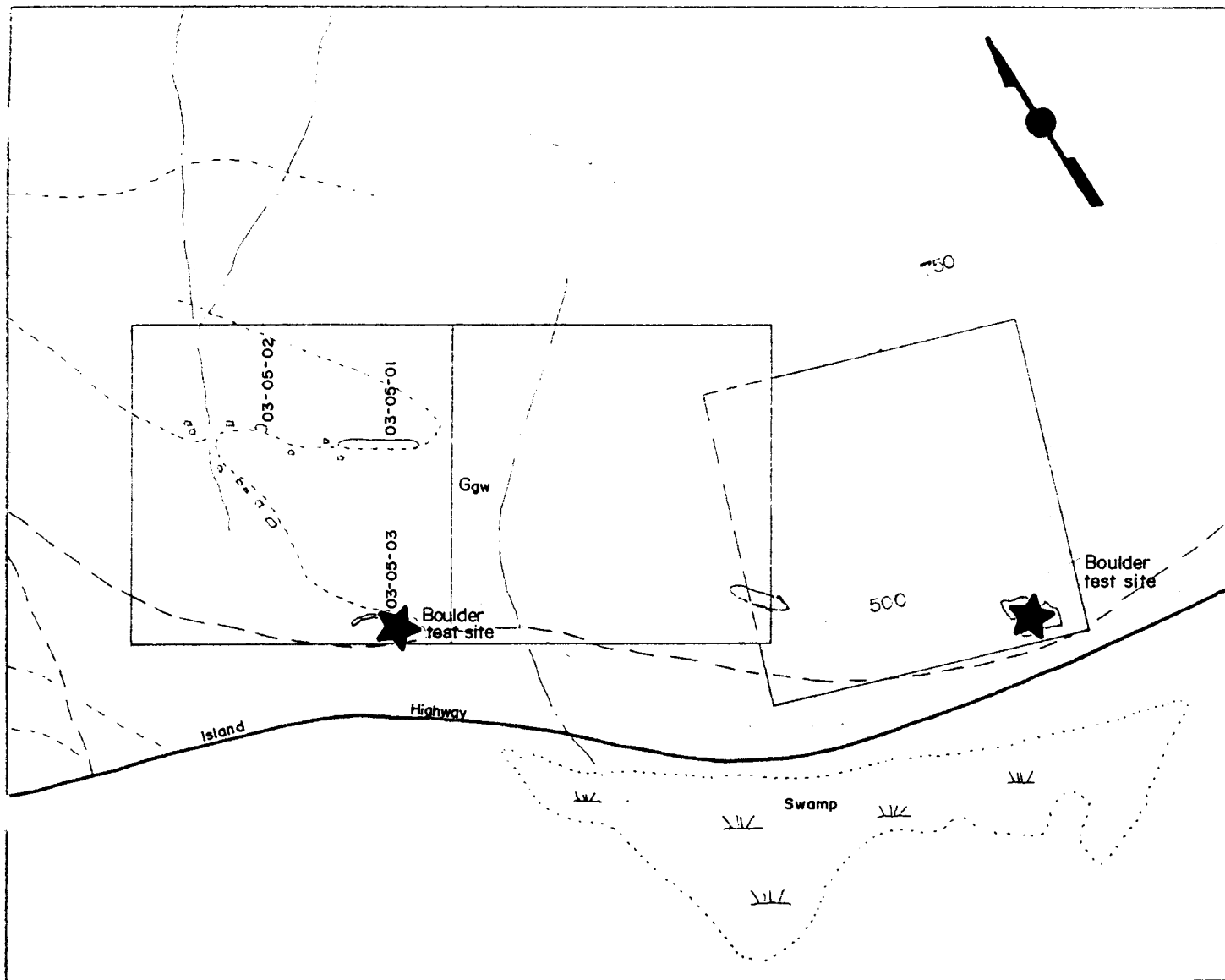
The zones of interest for dimension stone are the lighter colored monzonites and associated leuco-granodiorite, and the dark to black gabbros. The lighter rocks are pink to red or white and contain less than 5% mafics, while the darker rocks are black and contain 30%-50% mafics. The zone targeted for initial exploration is Zone II, the core of the Vernon Batholith.

Vernon Batholith

The Vernon Batholith of the Jurassic Island Intrusions is the main focus of the granite exploration. The Vernon Batholith is a large rather homogeneous body of medium- to coarse-grained plutonic rocks ranging from biotite-hornblende quartz diorite to leuco-quartz monzonite. It is elongate in an approximate north-south direction, is up to about 10 miles wide and occupies much of the upper Nimpkish Valley with northward extension in the head water area of Tsitika River. To the south it connects with the Nootka and Bedwell batholiths. It is entirely enclosed by Karmutsen volcanics.

The rocks are readily divisible into two distinct petrographic groups. Light-pink colored leuco-granodiorite and leuco-quartz monzonite are exposed in an elongate central core marked by Klaklakama Lakes in its middle part, and a poorly defined area east of Vernon Lake, but most of the batholith consists of dark-grey biotite-hornblende quartz diorite and granodiorite.

Except for the on-going exploration programs of the north Island dimension stone project undertaken by the author, there has been no exploration undertaken for dimension stone "granite" within the Vernon Batholith.



LEGEND

Ggw Grey white granodiorite

 Boulder

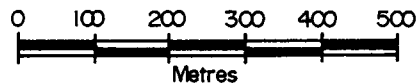
 Creek

 Outcrop

 Road

03-05-01 Sample location

50 metre contour interval



Mammoth Geological Ltd.

M315 Property

GEOLOGY

DRAWN BY: RT Henneberry

SCALE : 1:10,000

DATE : December 1994

FIGURE : 5

1994 EXPLORATION PROGRAM

The M315 property lies near the northeast contact of the Vernon Batholith. This property lies near the valley floor on the south facing slope. The stone on 315-1 claim outcrops in a natural bench that ranges in structure from massive to heavily fractured. The stone on M315-2 and M315-3 outcrops in a large knob in a heavily treed area. Numerous boulders ranging in size from 50 to 300 tons lie adjacent to the existing logging road on the southern boundary of all three claims.

The 1994 exploration program consisted of preliminary prospecting and mapping, followed by a boulder testing program on several of the boulders on the 315-1 and M315-3 claims. Approximately 30 tons was cut into 4 inch squared split face granite, while approximately 225 tons was cut into 5 ton block and sent to Vancouver for market testing. Approximately 50 tons has been used to date on one jobsite. Further jobsite use is required to offer an adequate assessment of the potential of the property.

Property Mapping

Mapping was confined to areas adjacent to existing logging roads. Though additional outcrops were noted, they were paid little attention as considerable road building would be required to access the outcrops.

The stone of interest is a medium-grained, equigranular, grey-white, hornblende-biotite granodiorite. The constituents are: 20-25% anhedral (5-7mm) cream K-feldspar, 40-45% anhedral (5-7mm) white plagioclase, 20% anhedral, grey (5-10mm) quartz and 10-15% black (5-10mm) mafics with hornblende over biotite.

This stone has a fresh, clean appearance on newly exposed surfaces, with little sign of alteration. The stone weathers well, as little rusting or other deleterious substances were noted on the natural bench faces.

No sulfides were noted in any of the samples, or on the weathered surfaces. The stone is peppered with xenoliths, typical of the Island Intrusions. They can range from 0-5% of the granodiorite, ranging in size from 2-10 centimetres, though an occasional 30 cm xenolith has been observed. They generally show a rounded character, and give the stone "a character" for structural purposes.

The stone is massive to fractured in outcrop with one section of heavily fractured granodiorite lying between two massive sections. The topography is terraced or benched on this property, with a unmaintained logging road along the front edge of a solid bench of granite. The fracture pattern appears to be spaced close enough to allow extraction of master blocks in the order of 50 to 150 tons.

Boulder Testing

The boulder testing program was undertaken in May and June and again in December and January. The program in May and June involved processing 50 tons of the 75 ton boulder on the 315-1 claim into 5 ton block (20 tons) and 4 inch split face granite (30 tons). The program in December and January involved test quarrying a 100 ton boulder and one-half of a 200 ton boulder into 5 ton block for test marketing in Vancouver.

The purpose of the May and June program was to ensure the granite could be split into 4 inch squared split face granite, the desired end product. This involves the splitting of the granite with plugs and feathers into repeatedly smaller blocks to the final stage where it can be split with a hammer.

The splitting showed the granite to have a very distinct grain. This granite does not split into consistent 4 inch pieces however, as the end product ranges in size from 3 to 5 inches and all ranges in between. As well, the split face of the individual pieces is rough, giving the stone a textured appearance and a "rough" feel.

The splitting also showed the stone to be peppered with 2-5 centimetre black elongated xenoliths. While this gives the split faced stone a definite character, it severely curtails the use of this granite for polished dimension stone.

The boulders on the M315-3 claim were split into 5 ton block. As on the 315-1 claim the stone splits along a distinct grain. Approximately 2 tons of waste was split into 4 inch split face granite. The split face stone displayed the same characteristics as the granite on 315-1.

One of the boulders hosts a small (2 centimetre) aplite dyke cutting across it at a shallow angle. The stone does not break along the dyke contacts on the 4 inch split face, giving the stone a very interesting appearance.

The boulders show a marked increase in volume and size of xenoliths. At this end of the property the xenoliths average 5-10 centimetres in size, though xenoliths as large as 40 centimetres were encountered. The concentration of xenoliths is less than one percent.

Marketing

Marketing carries almost an equal importance to geology for any industrial mineral property. The two key aspects of marketing for the north Island dimension stone project are: acceptability of the stone in the marketplace and transportation of the stone from quarry to fabrication or job site.

The marketing assessment of the north Island granite is a three step process. After the property has been acquired and prospected, resulting in the identification of a potential quarry site, a small (20 to 50 ton) amount of the desired end product, in this instance 4 inch squared split face granite, is produced. This stone is then shown to end users, namely masons and landscapers, for opinions and general comments. The most important function of this phase of the marketing is to get some of the end users to agree to try the stone on a few job sites.

The second step is to produce a small volume, 500 to 1000 tons, of either 5 ton block if the mason will make the 4 inch squared split face himself or desires other end products, or 4 inch squared split face to be supplied to a few job sites. This will provide frank opinions of the stone and allow the initial compilation of a photo portfolio for future marketing and eventual sales.

A few of the 5 ton blocks can be sent to fabricators, who will give an initial assessment of the polished potential of the stone after cutting and polishing it. A small volume of the desired end product, likely tile and slab, will be available to distribute to projected end users, namely marble and granite shops.

The other key aspect to be completed by this time is to establish firm numbers for transportation. In the case of the north Island plutons the options are water (barge) or truck (Super "B" train). While water appears to be considerably cheaper on first appearance, there are numerous costs and problems associated with water transportation:

- 1) loading - moving product from quarry site to barge
- 2) unloading - moving product from barge to job site
- 3) volume - at least 1000-2000 tons must be moved to make the barge economical

Transportation by Super "B" train appears to be the most economical on an overall basis, because:

- 1) minimal handling - quarry to truck to job site
- 2) minimal volume - only 46 tons must be moved at one time

The third stage in the marketing process is to establish the quarry bench and produce a bulk test of 5 and 20 ton block in the range of 1000 to 2000 tons. The 5 ton block is supplied to the masons, again to show the stone is consistent in color, texture and grain. The 20 ton block is supplied to fabricators to produce the end products for distribution to potential purchasers. Purchasers of 20 ton block for polished dimension stone will demand to see the quarry site and actual **quarry bench** before they will consider block purchases. They want to verify consistency of color, grain and texture and ensure sufficient reserves are in place for continued supply.

On the M315 property, step one and step two have been for the most part completed. The initial assessment of the stone by masons and landscapers was favorable, with a few agreeing to try the stone at the job site. Approximately 225 tons have been cut into 5 ton block with about 150 tons moved to the masons, where it is being tried on a few job sites. Another 300 tons will be supplied to complete this stage.

The fabricators in the lower Mainland are not keen on taking and processing the 5 ton block from the boulders. They see too many xenoliths and will prefer to wait until a quarry bench is established.

DISCUSSION

Though the M315 property was not the first property staked as a result of the on-going exploration and assessment of the granite potential of the north Island, it is the first property that has undergone the phase two exploration program.

The results can be described as good, though not great. The granite appears to have a market in the split face area. The market assessment to date has shown the stone can be used on job sites in the lower Mainland, the main initial market. The appealing color and character, due to small xenoliths, appear to outweigh the inconsistent split nature of individual 4 inch pieces at this stage.

The xenoliths will severely curtail the polished stone potential of this granite. Polished stone should be xenolith free, especially for Pacific Northwest and International markets. The acceptance of the *Fox Island* granite, a stone very similar to the M315 stone, for both split face and polished stone in the local market suggests the M315 granite should have a local polished market, though.

Initial discussions with suppliers suggest the M315 stone would have a use as polished slab for an end use of counter tops, vanities and fireplaces. Cladding and tile uses are minimized due to the xenoliths.

The remaining boulders on the property should be test quarried and supplied to the lower Mainland to complete the initial market assessment.

The solid bench on the 315-1 claim is a potential quarry site and a 1000-2000 ton bulk test is warranted for this location. This stone should be supplied to both structural and polished stone suppliers to complete the market analysis and ensure the stone has a place in the market place.

Another of the properties located during the exploration program, the S90, has a much better natural quarry site. Most of the effort in the grey-white granite of the Vernon batholith should be directed at this property in 1995. The M315 property should be maintained in good standing in the event the results from the S90 property are not favourable.

CONCLUSIONS AND RECOMMENDATIONS

The M315 property was identified and staked as part of the regional exploration and assessment program of the north Island plutons. The grey-white granodiorite from this property is projected to have use predominantly as 4 inch squared split face granite and to a lesser extent as polished dimension stone.

Exploration to date has consisted of preliminary prospecting and boulder testing. The preliminary prospecting identified several 50-300 ton boulders on the claim group and also identified a broken to massive bench outcrop, a potential quarry site.

The boulder testing program is presently three-quarters completed. Some of the boulders noted were test quarried, yielding ± 30 tons of 4 inch squared split face granite and ± 225 tons of 5 ton block. Approximately 150 tons has been supplied to masons for initial use on actual job sites, the result of a initial marketing analysis and concentrated follow-up marketing effort.

The stone splits reasonably well along grain, a key requisite for use in the structural market. The property lies near the northeast contact of the Vernon batholith, its host pluton, and is therefore susceptible to xenoliths. These xenoliths will severely hamper the potential polished stone markets, more in the international market than the local market.

The results obtained to date from the boulder testing and marketing programs warrant further work. The boulder testing program should be completed. A 1000-2000 ton bulk test from the proposed quarry site in the bench outcrop is recommended for this property.

The M315 property is one of a number of properties staked in a larger exploration assessment program. A better natural quarry site has been identified on one of the other properties acquired. While there is ample justification for the bulk test recommended for the M315 property, the limited resources available dictate the best site gets developed first.

The total cost to complete the remainder of the boulder testing program and undertake the bulk testing program is estimated at \$52,369.

To date, exploration expenditures on the M315 property are \$6,700.

REFERENCES

Henneberry,R.T. (1992). Marble Potential of the North End of Vancouver Island. Private Report 42p.

Henneberry,R.T. (1994). Final Compilation Report, 1993 Exploration and Prospecting Program for the Northern Vancouver Island Dimension Stone Project. Private Report 107p.

Henneberry,R.T. (1995). Final Compilation Report, 1994 Exploration and Prospecting Program for the Northern Vancouver Island Dimension Stone Project. Private Report 97p.

Muller,J.E. (1977). Geology of Vancouver Island. Geological Survey of Canada Open File 463.

Muller,J.E., K.E.Northcote and D.Carlisle (1974). Geology and Mineral Deposits of Alert - Cape Scott Map-Area (92L-102I) Vancouver Island, British Columbia. Geological Survey of Canada Paper 74-8. 77p.

Muller,J.E., B.E.B.Cameron and K.E.Northcote (1981). Geology and Mineral Deposits of Nootka Sound Map-Area, Vancouver Island, British Columbia. Geological Survey of Canada Paper 80-16. 53p.

STATEMENT OF QUALIFICATIONS

I, R. Tim Henneberry, am the principle of Mammoth Geological Ltd., a geological consulting firm with offices at 9250 Carnarvon Road, Port Hardy, B.C. The mailing address is Box 5250, Port Hardy, B.C. V0N 2P0

I earned a Bachelor of Science Degree majoring in geology from Dalhousie University, graduating in May 1980.

I have practiced my profession continuously since graduation.

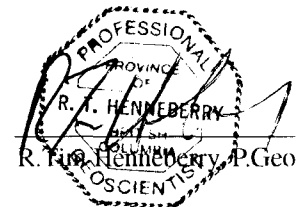
I am registered with the Association of Professional Engineers and Geoscientists in the Province of British Columbia as a Professional Geoscientist. I am also a Fellow of the Geological Association of Canada.

I supervised the exploration program completed on the M315 claims during the following dates: May 3, May 22-23, May 26, June 12, December 27-29, January 26-27 and February 25. I am presently the owner of the M315 1-3 mineral claims.

I am the principle of Mammoth Geological Ltd.

This report may be used for any purpose normal to the business of Mammoth Geological Ltd., provided no part is used in such a manner to convey a meaning different than that set out in the whole.

Dated this 30th day of April in the Town of Port Hardy, British Columbia.



STATEMENT OF COST

M315 Property

Exploration dates: May 3, 22, 23, 26, Jun 12, Dec 27, 28, 29, Jan 26, 27, Feb 25
Report dates: Mar 20, 21, 23, 25, 26, 27

Project Manager	10 days	@	300.00 /day	\$3,000.00
Driller (R. Morris)	5 days	@	200.00 /day	\$1,000.00
Assistant (L. Wilson)	5 days	@	100.00 /day	\$500.00
Loader Operator (L. Bloomfield)	1 days	@	150.00 /day	\$150.00
Loader Hours	4 hrs.	@	75.00 /hour	\$300.00
Vehicles	15 days	@	50.00 /day	\$750.00
Analysis	2 samp	@	50.00 /sample	\$100.00
Documentation	3 days	@	300.00 /day	\$900.00

M315 Property Costs

\$6,700.00

COST ESTIMATES

Phase I - Mapping and Sampling (2 days)
Completed

Phase II - Boulder Testing (5 days)
One-half completed

Quarrying Costs (Personnel and Equipment)	\$1,688	
Field Costs (Geological and Supervision)	\$1,125	
Support Costs (Room and Board, Vehicles)	\$812	
Market Assessment	\$2,113	
Documentation (Reports)	\$2,250	
Contingency (15%)	\$1,198	\$9,186

Phase III - Pre-production Bulk Test (10 days)

Contractor Cost (Machinery)	\$8,000	
Quarrying Equipment Cost	\$2,300	
Quarrying Personnel Cost	\$5,000	
Field Costs (Geological and Supervision)	\$4,500	
Support Costs (Room and Board, Vehicles)	\$3,250	
Sample Preparation	\$10,000	
Documentation (Reports)	\$4,500	
Contingency (15%)	\$5,633	\$43,183

Phase I - Completed	\$0	
Phase II - One-half Completed	\$9,186	
Phase III - Bulk Test	\$43,183	

TOTAL BUDGET FOR M315 PROPERTY **\$52,369**

SAMPLE DESCRIPTION

M315

Sample 03-05-01 - Medium grained (5-7mm) anhedral, equigranular grey white granodiorite. Composition: 10-15% black mafics, 20% smokey quartz, 20-25% cream K-feldspar, 45% white plagioclase. This sample is unfractured. No visible mineralization.

Outcrop - This outcrop is continuous for 100 metres. The southern end is massive and the best potential development site. There appears to be a series of parallel fractures spaced at 2 metre intervals, with little cross fracturing. This zone is approximately 30 metres long. The remainder of the outcrop ranges from heavily sheeted to well fractured.

Sample 03-05-02 - Medium grained (5-7mm) anhedral, equigranular grey white granodiorite. Composition: 10-15% black mafics, 20% smokey quartz, 20-25% cream K-feldspar, 45% white plagioclase. This sample is unfractured. No visible mineralization.

Outcrop - This is a small outcrop less than 10 metres in size.

Sample 03-05-03 - Medium grained (5-7mm) anhedral, equigranular grey white granodiorite. Composition: 10-15% black mafics, 20% smokey quartz, 20-25% cream K-feldspar, 45% white plagioclase. This sample is unfractured. No visible mineralization.

Outcrop - This is an old pit likely used for road ballast. It has been blast fractured at the face, though there appears to be strong potential for blocks. There is a large massive block of stone ± 75 tons in size, which was initially tested for squared split stone.

COMOX COAL FIELD VANCOUVER ISLAND COAL ASSESSMENT REPORTS 29/3/99 BARRY RYAN 250 952 0418

REPORT_NO	RPT_YEAR	IDENT	PROP_CODE	NTS1	CENT_LAT	CENT_LONG	OPERATOR	OWNER	AUTHOR	YEAR_REC	MONTH_REC	AREA_LIC	NO_BORE	NO_TRENCH	NO_BULK	NO_MAPS	NO_X_SECT	NO_STRATS	NO_CORREL	NO_PROX	NO_ULTI	NO_PETRO
00063	13	CX012	QUINSAM	092F13	0	0	MAPS & LETTERS			0	0	0.0	0	0	0	0	0	0	0	0	0	0
00064	18	CX012	QUINSAM	093F13	0	0	CANADIAN COLL.	CANADIAN COLL.		0	0	0.0	0	0	0	0	0	0	0	0	0	0
00049	20	CX006	COMOX	092F11	0	0	CANADIAN COLL.	CANADIAN COLL.		0	0	0.0	0	0	0	2	0	0	0	0	0	0
00050	22	CX006	COMOX	092F13	0	0	CANADIAN COLL.	CANADIAN COLL.		0	0	0.0	0	0	0	1	0	0	0	0	0	0
00027	24	CB003	QUESNEL	093B16	0	0	CARIBOO COAL&CLAY	CARIBOO COAL&CLAY CO		0	0	0.0	0	0	0	0	0	0	0	7	0	0
00028	29	CB003	QUESNEL	093B16	0	0	CARIBOO COAL&CLAY	CARIBOO COAL&CLAY CO		0	0	0.0	0	0	0	0	0	0	0	0	0	0
00029	29	CB003	QUESNEL	093B16	0	0	CARIBOO COAL&CLAY	CARIBOO COAL&CLAY CO		0	0	0.0	0	0	0	0	0	0	0	1	0	0
00030	29	CB003	QUESNEL	093B16	0	0	CARIBOO COAL&CLAY	CARIBOO COAL&CLAY CO		0	0	0.0	0	0	0	0	0	0	0	0	0	0
00023	30	CB001	AUSTRALN	093B16	0	0	CARIBOO COAL&CLAY	F.H.HUTTON		0	0	62.0	0	0	0	1	1	0	0	4	0	0
00024	30	CB001	AUSTRALN	093B16	0	0	CARIBOO COAL&CLAY	CARIBOO COAL&CLAY CO		0	0	0.0	0	0	0	0	0	0	0	0	0	0
00025	30	CB001	AUSTRALN	093B16	0	0	CARIBOO COAL&CLAY	CARIBOO COAL&CLAY CO		0	0	0.0	0	0	0	0	0	0	0	0	0	0
00031	30	CB003	QUESNEL	093B16	0	0	CARIBOO COAL&CLAY	CARIBOO COAL&CLAY CO		0	0	0.0	0	0	0	0	0	0	0	0	0	0
00032	30	CB003	QUESNEL	093B16	0	0	CARIBOO COAL&CLAY	CARIBOO COAL&CLAY CO		0	0	0.0	0	0	0	0	0	0	0	0	0	0
00033	30	CB003	QUESNEL	093B16	0	0	CARIBOO COAL&CLAY	CARIBOO COAL&CLAY CO		0	0	0.0	0	0	0	0	0	0	0	0	0	0
00034	30	CB003	QUESNEL	093B16	0	0	CARIBOO COAL&CLAY	CARIBOO COAL&CLAY CO		0	0	0.0	0	0	0	0	0	0	0	0	0	0
00051	43	CX006	COMOX	092F11	0	0	CANADIAN COLL.	CANADIAN COLL.		0	0	0.0	0	0	0	0	0	0	0	0	0	0
00042	48	CX004	CAMPBELL	092F11	0	0	R.W.WYLLIE	R.W.WYLLIE		0	0	0.0	0	0	0	3	1	4	0	38	0	0
00052	48	CX006	COMOX	092F11	0	0	CANADIAN COLL.	CANADIAN COLL.		0	0	0.0	0	0	0	1	0	0	0	7	4	0
00061	53	CX006	COMOX		0	0	SUMMARY INFO.	SEE COMMENT RECORD		0	0	0.0	0	0	0	0	0	0	0	0	0	0
00062	64	CX015	OYSTER R	092F11	0	0	EXCERPT BSC THESIS	M.G.MEDDING-AUTHOR		0	0	0.0	0	1	0	0	0	0	0	0	0	0
00035	71	CB003	QUESNEL	093B16	0	0	MASTER EXPL. LTD.	MASTER EXPL. LTD.		0	0	0.0	21	0	0	6	4	0	1	12	0	0
00053	73	CX006	COMOX	092F	0	0	BC HYDRO	WELDWOOD		0	0	0.0	0	0	0	7	0	0	0	0	0	0
00727	75	CX006	COMOX	092F	0	0	EPEC CONSULTING-ENV.	WELDWOOD	M.P. CURCIO	75	0	0.0	0	0	0	12	0	0	0	0	0	0
00772	77	CX002	ASH RIVR	092F	0	0			M. CURCIO	91	6	91.0	0	0	0	0	0	0	0	0	0	0
00065	77	CX012	QUINSAM	092F13	0	0	WELDWOOD&LUSCAR	WELDWOOD&LUSCAR		0	0	16.0	0	0	0	0	0	0	3	0	0	
00066	77	CX012	QUINSAM	092F13	0	0	LUSCAR	WELDWOOD		0	0	226.0	10	0	0	4	12	1	0	39	2	0
00067	77	CX012	QUINSAM	092F13	0	0	LUSCAR	WELDWOOD		0	0	226.0	100	0	0	6	15	5	1	0	0	0
00068	77	CX012	QUINSAM	092F13	0	0	LUSCAR	WELDWOOD		0	0	35.0	0	0	0	0	0	0	0	0	0	0
00069	77	CX012	QUINSAM	092F13	0	0	LUSCAR	WELDWOOD		0	0	0.0	0	0	4	0	0	0	8	0	0	0
00070	77	CX012	QUINSAM	092F13	0	0	LUSCAR	WELDWOOD		0	0	0.0	0	0	0	4	0	0	0	0	0	0
00766	78	CB003	QUESNEL	093B09W	0	0			P. GRAHAM	91	6	0.0	3	0	0	2	0	0	0	0	0	0
00037	78	CX001	ANDERSON	092F11	4943	12510	WELDWOOD CANADA LT	WELLINGTON COLLIER	MICHELE CURCIO	79	5	14.0	21	0	0	5	4	0	0	8	0	0
00054	78	CX006	COMOX		0	0	PRELIMINARY REPORT	WELDWOOD	SEE COMMENT RE	78	0	0.0	0	0	0	3	0	0	0	0	0	0
00056	78	CX010	HAMILTON	092F11	4935	12503	WELDWOOD	WELLINGTON COLLIERY		0	0	16.0	18	0	2	5	4	0	0	13	1	0
00071	78	CX012	QUINSAM	092F11	0	0	LUSCAR	WELDWOOD		0	0	0.0	353	0	0	24	7	7	2	0	0	0
00040	79	CX002	ASH RIVR	092F06	0	0	HUBBAY COAL CO.	HUBBAY COAL CO.		0	0	52.0	14	0	0	2	2	0	1	0	0	0
00773	79	CX014	ARRWSMTH	092F07E	0	0		UNDER APPLICATION	R. SWAREN	91	6	13.0	0	0	0	3	0	0	0	0	0	0
00771	79	CX018	IDLE CRK	092F11E	0	0		UNDER APPLICATION	R. SWAREN	91	6	0.0	0	0	0	4	0	0	0	0	0	0
00036	80	CB003	QUESNEL		0	0	REPORT, SEE COMMENT		T. MCCULLOUGH	80	6	0.0	0	0	0	6	0	0	0	0	0	0
00055	80	CX006	COMOX	092F01	0	0	BP EXPLORATIONS	BP CANADA	BICKFORD LEE	0	0	189.0	11	0	0	27	0	0	0	0	0	0
00810	80	CX010	HAMILTON	092F11	0	0	WELDWOOD OF CANADA	WELDWOOD OF CANAD	A. PEACH	91	6	0.0	0	0	0	1	0	0	0	0	0	0
00058	80	CX018	IDLE CRK	092F11	0	0	ESSO RESOURCES LTD.	ESSO RESOURCES LTD.	A R PEACH	0	0	3.0	0	0	0	1	0	0	0	0	0	0
00073	80	CX020	THAMES	092F07	0	0	ESSO RESOURCES LTD.	ESSO RESOURCES LTD.	R.PEACH	0	0	183.0	3	0	0	3	0	0	0	0	0	0

NANAIMO COAL FIELD VANCOUVER ISLAND COAL ASSESSMENT REPORTS BARRY RYAN 29/3/99

REPORT_NO	RPT_YEAR	IDENT	PROP_CODE	NTSI	CENT_LAT	CENT_LONG	OPERATOR	OWNER	AUTHOR	YEAR_REC	MONTH_REC	AREA_LIC	NO_BORE	NO_TRENCH	NO_BULK	NO_MAPS	NO_X_SECT	NO_STRATS	NO_CORREL	NO_PROX	NO_ULTI	NO PETRO CARB TEST	WASH_TEST	SURF_GEO1	SURF_GEO2	SURF_GEO3
00173	0	N 003	NANAIMO	092F01	0	0	MULTIPLE	MULTIPLE		0	0	0.0	0	0	0	0	0	0	0	0	0	0	N			
00175	0	N 005	NANOOSE	092F08	0	0	MULTIPLE	MULTIPLE		0	0	0.0	0	0	0	0	0	0	0	0	0	0	N			
00170	43	N 001	CASSIDY	092G04	0	0	J.M.CUMMINGS			0	0	0.0	0	0	0	0	0	0	0	0	0	0	Y			
00174	47	N 003	NANAIMO	092F01	0	0				0	0	0.0	0	0	0	1	0	0	0	0	0	0	N			
00792	79	N 006	NANAIMO	092G	0	0		M. CURCIO		91	6	0.0	0	0	0	3	6	0	0	0	0	0	N			
00176	80	N 007	OKAY MT	092F01	0	0	ESSO RESOURCES LTD.	ESSO RESOURCES LT	A R PEACH	0	0	33.0	5	0	0	2	2	0	0	1	1	0	N			
00168	80	N 008	BENSON	092F01	0	0	NETHERLANDS PACIFIC	NETHERLANDS PACI	A M DE QUADROS	0	0	52.0	0	0	0	2	0	1	0	2	0	0	Y			
00172	80	N 009	HASLAM	092G04	0	0	ESSO RESOURCES LTD.	ESSO RESOURCES LT	R.PEACH	0	0	138.0	5	0	0	2	1	0	0	0	0	0	N			
00171	80	N 010	COWICHAN	092B12	0	0	BP EXPLORATIONS	BP CANADA	BICKFORD&LEE	0	0	0.0	0	0	0	5	0	0	0	0	0	0	N			
00169	81	N 008	BENSON	092F01	0	0	GULF CANADA RES.	GULF CANADA RES.	J H PERRY	0	0	135.0	14	0	0	2	5	0	3	0	0	0	N			
00177	82	N 002	WOLF MTN	092F01	0	0	WOLF MOUNTAIN COAL	NETHERLAND PACIFI	JOHN PERRY	0	0	12.0	16	0	0	10	8	0	0	19	3	0	N			
00804	82	N 002	WOLF MTN	092F01E	0	0	WOLF MOUNTAIN COAL	NETHERLAND PACIFI	JHP CONSULTING	91	6	12.0	0	0	0	3	3	0	2	22	6	0	Y			
00703	83	N 002	WOLF MTN	092F01E	4907	12402	WOLF MOUNTAIN COAL	NETHERLAND PACIFI	CRAIG ROBERTS	84	7	12.0	0	0	1	5	0	0	0	0	0	0	N			
00770	83	N 003	NANAIMO		0	0	MULTIPLE	MULTIPLE	S. GARDNER	91	6	0.0	7	15	0	5	18	0	0	166	0	0	N			
00708	84	N 002	WOLF MTN	092F01E	4907	12402	WOLF MOUNTAIN COAL	NETHERLAND PACIFI	CRAIG ROBERTS	86	4	12.0	0	0	0	8	0	0	0	0	0	0	N			
00719	85	N 004	S. FORKS	092G04	4906	12359	TWINFORKS MINING	TWINFORKS MINING	S.L. GARDNER	85	10	1.0	28	0	0	3	0	0	0	0	0	0	N			
00720	87	N 006	NANAIMOB	092G	0	0	SUMMARY (BOREHOLES)		VARIOUS SOURCE	0	0	0.0	297	0	0	2	5	0	0	25	0	0	Y			



Title = coal vancouver island [Keyword]





14 Records

Records 1 to 10 /14

1. **COAL RESOURCE STUDY OF COMOX BASIN-NANAIMO SERIES, VANCOUVER ISLAND, BRITISH COLUMBIA : PRELIMINA...** - CURCIO, MICHELE P. [**1 rec.*] - 1975
2. **Coal resources and coal mining on Vancouver Island.** - Gardner, S.L. [**2 rec.*]
3. **Coal resources and coal mining on Vancouver Island.** - Gardner, S.L. [**2 rec.*] - 1999
4. **ENVIRONMENTAL OVERVIEW OF POTENTIAL SITES FOR A COAL LOADING TERMINAL ON VANCOUVER ISLAND..** - Environmental Project Consulting. [**2 rec.*] - 1984
5. **FINANCIAL ANALYSIS OF BARGING COAL FROM VANCOUVER ISLAND. - BRITISH COLUMBIA. MINISTRY OF INDUSTRY AND SMALL BUSINESS DEVELOP...** [**530 rec.*] - 1981
6. **FINANCIAL ANALYSIS OF BARGING COAL FROM VANCOUVER ISLAND..** - British Columbia. Ministry of Industry and Small Business Development. [**530 rec.*] - 1981
7. **GEOLOGY, HISTORY AND POTENTIAL OF VANCOUVER ISLAND COAL DEPOSITS.** - MULLER, J.E. [**12 rec.*] - 1971
8. **PRELIMINARY ENGINEERING EVALUATION OF VANCOUVER ISLAND PORTS FOR BULK COAL EXPORT.** - H.A. Simons [**18 rec.*] - 1981
9. **PRELIMINARY ENGINEERING EVALUATION OF VANCOUVER ISLAND PORTS FOR BULK COAL EXPORT/TRANSSHIPMENT.** - H. A. SIMONS (INTERNATIONAL) LTD. [**2 rec.*] - 1981
10. **Proposal for coal-slurry transportation study : Hat Creek to Vancouver Island. --.** - Shawigan-Pryde Flavin Company Limited. [**1 rec.*] - 1972.



Records 11 to 14 /14

- 11.  **VANCOUVER ISLAND COAL PORT EVALUATION : EXECUTIVE SUMMARY. - BRITISH COLUMBIA. MINISTRY OF TRANSPORTATION AND HIGHWAYS [**95 rec.*] - 1981**
- 12.  **VANCOUVER ISLAND COAL PORT EVALUATION PRELIMINARY ANALYSIS OF ROAD AND RAIL ACCESS. - Johnson, Jan A. [**3 rec.*] - 1981**
- 13.  **VANCOUVER ISLAND COAL PORT EVALUATION, PRELIMINARY ANALYSIS OF ROAD AND RAIL ACCESS.. - Johnson, Jan A. [**3 rec.*] - 1981**
- 14.  **VANCOUVER ISLAND COAL PORT STUDY : ENVIRONMENTAL-LAND USE INVENTORY.. - Van Doesburg, Kathryn. [**1 rec.*] - 1981**