COAL ASSESSMENT REPORT TITLE PAGE AND SUMMARY

TITLE OF REPORT:
Summary report on the Suquash coal licences (Rupert Land District, British Columbia)

TOTAL COST: unknown

AUTHOR(S): **C.G. Cathyl-Bickford, 25 November 2002; title and summary dated 4 April 2016**
SIGNATURE(S):
NOTICE OF WORK PERMIT NUMBER(S)/DATE(S):
STATEMENT OF WORK EVENT NUMBER(S)/DATE(S):

YEAR OF WORK: **2002-2003 license term**

PROJECT NAME: **Suquash**

COAL LICENSE(S) AND/OR LEASES ON WHICH PHYSICAL WORK WAS DONE:
none
COAL LICENSE(S) IN PROJECT AREA ON WHICH NO PHYSICAL WORK WAS DONE OVER THE CURRENT REPORTING PERIOD: **391835, 391836, 391837, 391838, and 391839**

BC MINERAL INVENTORY MINFILE NUMBER(S), IF KNOWN: **92L 067**
MINING DIVISION: **Nanaimo**
NTS / BCGS: **NTS 92L/11 / BCGS 092L.064**
LATITUDE: **50° 37' 10.5"**
LONGITUDE: **127° 14' 24.1"** (at centre of work)
UTM Zone: **9U** EASTING: **624500** NORTHING: **5609000**

OWNER(S): **Neil Swift**
MAILING ADDRESS: **710 Back Road, Courtenay, B.C. V9N 3X2**

OPERATOR(S): **Priority Ventures Ltd.**
MAILING ADDRESS: **710 Back Road, Courtenay, B.C. V9N 3X2**

REPORT KEYWORDS: **Bituminous coal, Upper Cretaceous, Nanaimo Group, Suquash Formation, Upper Division, Middle Division, Lower Division, Upper Shale Unit, Coal Harbour Group, Alert Bay Volcanics, resource stratigraphy, Suquash Colliery.**

REFERENCES TO PREVIOUS ASSESSMENT WORK AND ASSESSMENT REPORT NUMBERS:
Coal Assessment Reports 92, 210, 213, 214, 215, 216 and 778.
WORK PROPOSED OVER THE NEXT YEAR (SPECIFY WHICH TENURE BLOCKS WILL SEE PHYSICAL WORK, IF KNOWN): **Geological mapping (Phase 1), drilling of up to three boreholes (Phase 2), one of which was recommended to test the rocks of the Coal Harbour Group; locations for drilling were not specified. Work programme was not done.**
RATIONALE FOR NEXT YEAR'S PROGRAM
Refining the understanding of structural geology of the Suquash Formation; confirmation and extension of thick coal development.

SUMMARY OF TYPES OF WORK IN THIS REPORT	EXTENT OF WORK (in metric units)	ON WHICH TENURES
GEOLOGICAL (scale, area)		
Ground, mapping	**2016 hectares**	**391835, 391836, 391837, 391838, amd 391839**
Photo interpretation	**none**	**n/a**
GEOPHYSICAL (line-kilometres)		
Ground	**none**	**n/a**
Airborne	**none**	**n/a**
Borehole: **interpretation of geophysical logs from earlier third-party drilling programmes**	**2 boreholes on-property; 2 more off-property**	**391838 and 391839**
Gamma, Resistivity	**none**	**n/a**
Caliper	**none**	**n/a**
Deviation	**none**	**n/a**
Dip	**none**	**n/a**
Others	**none**	**n/a**
Core:	**none**	**n/a**
Non-core:	**none**	**n/a**
SAMPLING AND ANALYSES		
Total Number of Samples:	**none**	**n/a**
Proximate	**none**	**n/a**
Ultimate	**none**	**n/a**
Petrographic	**none**	**n/a**
Vitrinite reflectance	**none**	**n/a**
Coking	**none**	**n/a**
Wash tests	**none**	**n/a**
Ash fusibility temperature	**none**	**n/a**
Mineral analysis of ash	**none**	**n/a**
PROSPECTING (scale/area)	**none**	**n/a**
PREPARATORY/PHYSICAL		
Line/grid (km)	**none**	**n/a**
Trench (number, metres)	**none**	**n/a**

Suquash-2002-cover_160404b.doc

SUMMARY REPORT

ON THE

SUQUASH COAL LICENCES

(RUPERT LAND DISTRICT, BRITISH COLUMBIA)

FOR

PRIORITY VENTURES LTD.

710 BACK ROAD, COURTENAY B.C. V9N 3X2

BY

C. GWYNETH CATHYL-BICKFORD, P.GEO.
WESTWATER MINING LTD.
88 GLAMIS GARDENS SW. CALGARY. ALBERTA T3E 6S4

25 NOVEMBER 2002

Table of Contents

List of Figures and Tables

List of Charts

List of Maps

1 SUMMARY

The Suquash coal licences are situated on Vancouver Island in south-western Canada near the towns of Port hardy and Port McNeill, British Columbia. The property is served by a sparse network of gravelled logging-roads which connect to a paved highway. Most elements of mining infrastructure are available within reasonable distances of Suquash.

The Suquash coal licences contain measured and indicated coal resources of 4.28 million tonnes of immediate interest for underground coal mining, mostly in the southeastern part of the property. Some of the resources lie in the northeastern part of the property, adjacent to and within an abandoned underground mine. The aggregate measured and indicated resources in this area are just over 270,000 tonnes. The mine would have to be dewatered and made safe before most of the 270,000 tonnes of resources could be worked.

The total area of the Suquash coal licences, as reported by the Ministry of Energy and Mines, is 2016 hectares. The Suquash area has been sporadically explored for coal from the early 19th century onwards. Major historic explorers of the property have been the Hudson's Bay Company, Pacific Coast Coal Mines Limited and the British Columbia Hydro and Power Authority.

As it stands, only the north-central portion of the property (centred on Coal Licence 391841 and the old Suquash Colliery) has been effectively explored. Other parts of the property are only partially explored, and a fair number of the existing boreholes have not reached both of the major exploration targets (the Suquash No.2 and No.5 coal beds).

Within the intensely-explored area, only the No.2 coal bed (and the locally-adjacent No.2 Rider coal) show any remaining potential for discovery of coal resources of immediate or future interest for underground coal mining. The No.2 coal bed in this area is relatively shallow (typically 50 to 90 metres), so it does have some modest merit as a target for further exploration, with a view to finding enough coal to support a very small underground mine. This coal is almost certainly too shallow to be of interest for coalbed gas exploration.

Outside the intensely-explored area, the best exploration target (based on drilling to date) is the deeper Suquash No.5 coal bed, which was found to be sufficiently thick (albeit containing numerous rock partings) in borehole SU-80-1 to consider it worthy of further work. The No.5 coal bed is a doubtful mining proposition because of its depth and its apparent dirtiness, but it may hold some interest for coalbed gas exploration.

Drilling results to date indicate the Suquash coals tend to contain numerous rock partings. Their gross thickness and net-to-gross ratios are generally insufficient for underground mining, with the exception of those areas where more than one coal bed has coalesced to form a thicker composite bed. The Suquash coals are of High Volatile 'C; bituminous rank.

A staged exploration programme is recommended for Suquash, commencing with a modest campaign of geological mapping, which if encouraging should allow for selection of drill locations.

2 INTRODUCTION AND TERMS OF REFERENCE

2.1 TERMS OF REFERENCE

This report presents a preliminary geological appraisal of Priority Ventures Ltd's Suquash coal property, comprising licences 391835 through 391843, inclusive.

2.2 PURPOSE OF REPORT

This report has been prepared for Priority Ventures Ltd.'s submission to stock-exchange regulatory agencies in keeping with the disclosure requirements of *National Instrument 43-101.*

2.3 SOURCES

Surface geological data contained in this report come primarily from geological observations and interpretations made by the author, supported by geological observations made by earlier workers.

Archival records of boreholes drilled by past operators were obtained by the author from the coal assessment files of the B.C. Ministry of Energy and Mines, and from the University of Washington Archives (UWA), situated at the Allen Library in Seattle, Washington. Copies of relevant British parliamentary papers concerning the Suquash coalfield were obtained by the author from the Koerner Library of the University of British Columbia, in Vancouver, British Columbia.

Mine plans of Suquash Colliery were obtained by the author from the Joseph Daniels and George Watkin Evans collections at UWA. Columnar sections of the No.2 coal bed in the mine were obtained by the author from the Daniels and Evans collections, and from the mine plan collection of the B.C. Mines Branch in Nanaimo, British Columbia.

2.4 EXTENT OF FIELD INVOLVEMENT OF QUALIFIED PERSON

The author, assisted by geological technologist K.V. Slater, conducted a brief geological reconnaissance of the Suquash property in November, 2002. Two days were devoted to mapping shoreline exposures of the coal-measures near the old Suquash Colliery, and scouting access roads and possible drill locations inshore within Priority Ventures' coal licences.

3 DISCLAIMER

An independent title search of mineral rights covering the Suquash coal property has not been conducted by the author, and any or all responsibilities concerning mineral titles are hereby disclaimed. Reliance has been placed upon the mineral tax rolls for Rupert Land District, and on the outline maps of Coal Licences 391835 through 391843, inclusive, as provided by the B.C. Ministry of Energy and Mines.

Core descriptions, descriptions of sample intervals, and descriptions and measurements within underground mine workings were not made by the author. In compiling the present report, the author has relied upon these reported observations which were made by other geologists and engineers. The author hereby disclaims any and all responsibility for the accuracy and precision of such third-party information.

4 PROPERTY LOCATION AND DESCRIPTION

The Suquash coal licences lie on the northeastern coast of northern Vancouver Island (**Figure 1**), within the southwestern corner of the province of British Columbia, Canada. All of the coal licences lie within a rectangular area bounded by 21 and 28 easting, and 06 and 12 northing (UTM NAD 83, in grid zone 9). National topographic map sheet 92L/11 and provincial TRIM map sheets 92L.054, 055, 064 and 065 cover the coal licence area.

The nearest incorporated municipalities are the town of Port Hardy, located 20 kilometres northwest, and the village of Port McNeill, located 13 kilometres southeast of the Suquash coal licences. The coal licences lie within the Mount Waddington Regional District, but are uninhabited. Immediately to the east of the coal licences is the seasonally-inhabited Cluxewe Indian Reserve.

4.1 DESCRIPTION OF THE SUQUASH COAL PROPERTY

The Suquash coal property consists of nine contiguous coal licences (granted by the Province of British Columbia) with an aggregate area of 2016 hectares. **Table 1** (below) lists the areas of each coal licence, and their outline is shown on **Figure 2.**

4.1.1 COAL LICENCE DETAILS

All of the Suquash coal licences were granted on February 15, 2002, to Mr. Neil Swift, who is presently serving as President of Priority Ventures Ltd. Details of each licence are presented below:

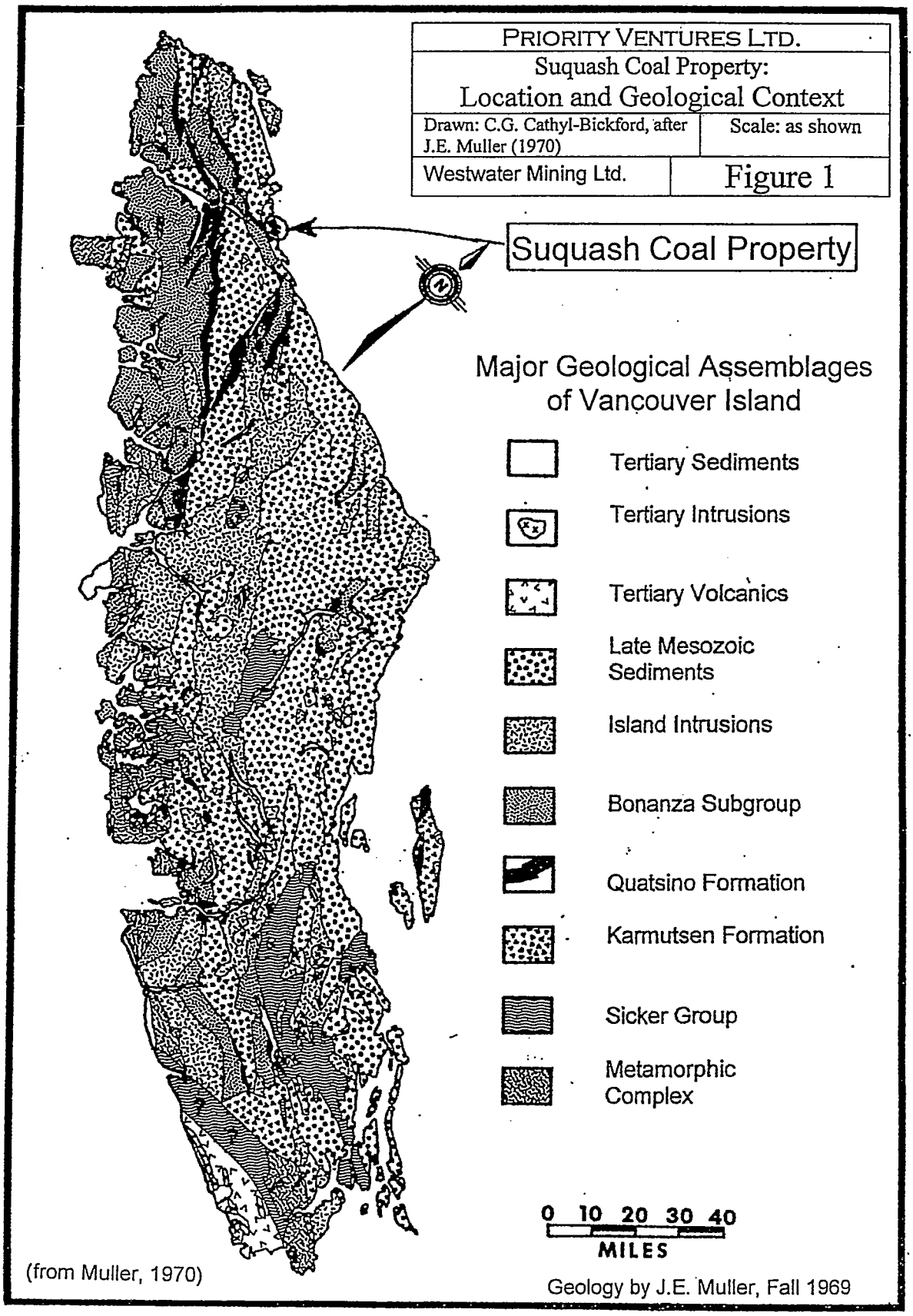
Table 1: Coal Licence Details

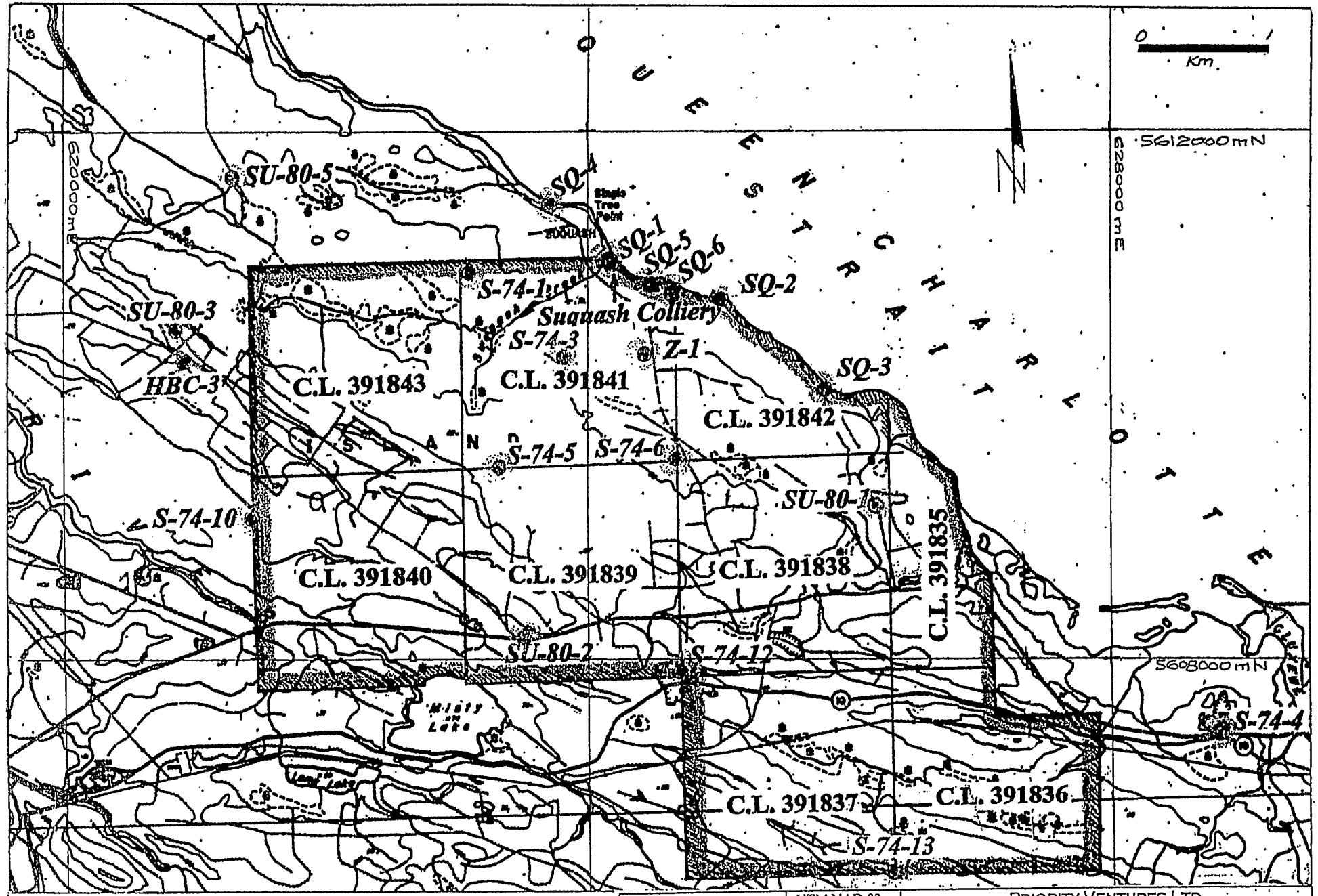
C.L. No.	Area in Hectares	Land Lots	Date Granted	C.L. No.	Area in Hectares	Land Lots	Date Granted
391835	115	Section 17, Township 2, Rupert Land District	February 15, 2002	391840	259	Section 14, Township 3, Rupert Land District	February 15, 2002
391836	224	Section 19, Township 2, Rupert Land District	February 15, 2002	391841	249	Section 15, Township 3, Rupert Land District	February 15, 2002
391837	259	Section 11, Township 3, Rupert Land District	February 15, 2002	391842	133	Section 16, Township 3, Rupert Land District	February 15, 2002
391838	259	Section 12, Township 3, Rupert Land District	February 15, 2002	391843	259	Section 34, Township 3, Rupert Land District	February 15, 2002
391839	259	Section 13, Township 3, Rupert Land District	February 15, 2002				

The Suquash coal licences are contiguous, with no known inholdings of alienated coal rights.

4.1.2 CURRENT STATUS OF THE COAL LICENCES

The Suquash coal licences have a one-year renewable term; they will remain in good standing until February 15, 2003, at which time they may be continued by payment of an annual rental fee of $7.00 per hectare.


PRIORITY VENTURES LTD.
Suquash Coal Property:
Location and Geological Context
Drawn: C.G. Cathyl-Bickford, after J.E. Muller (1970)
Scale: as shown
Westwater Mining Ltd.
Figure 1
Suquash Coal Property
Major Geological Assemblages of Vancouver Island
Tertiary Sediments
Tertiary Intrusions
Tertiary Volcanics
Late Mesozoic Sediments
Island Intrusions
Bonanza Subgroup
Quatsino Formation
Karmutsen Formation
Sicker Group
Metamorphic Complex
0 10 20 30 40
MILES
(from Muller, 1970)
Geology by J.E. Muller, Fall 1969



Scale: as shown	UTM NAD 83	PRIORITY VENTURES LTD.
Drawn: C.G. Cathyl-Bickford, P.Geo.		Suquash Coal Property: Coal Licence and Borehole Locations
Date: November 15, 2002		
Westwater Mining Ltd.		Figure 2

4.1.3 SURVEY STATUS

To the best of the author's knowledge, no recent resurvey of the Suquash coal licences has been conducted. Some of the land lots near the Suquash mine were surveyed by B.C. Hydro during their 1974 drill programme, and details of the survey were presented in Saunders' 1975 report on behalf of Dolmage Campbell and Associates. Coal licence boundaries, as presently granted, appear to correspond well to the regular pattern of land lots and natural boundaries within the Suquash area.

4.2 COMPANY'S INTERESTS IN THE PROPERTY

As mentioned in section 4.1 above, the Suquash coal licences were originally granted to Mr. Neil Swift, who is presently serving as president of Priority Ventures Ltd. On November 14, 2002, Mr. Swift assigned and transferred his interests in the coal licences to Priority Ventures Ltd. A signed and witnessed copy of the letter of assignment is in the author's possession.

Crown coal licences, as granted by the B.C. Ministry of Energy and Mines, carry with them the exclusive right to explore for coal within the licensed lands during the active term of the licence. Coal licences have one year terms, which are renewable upon application to the Minister of Energy and Mines. Application for renewal must be made in advance of the expiry of the coal licences.

4.2.1 SURFACE ACCESS AND OWNERSHIP STATUS

Coal licences *do not* convey surface rights to the lands, and access upon the lands must be negotiated with individual land owners. The surface land-owner at Suquash is believed by the author to be Western Forest Products Ltd. of Duncan, B.C, but the author's attempted checks of land status at the Courtenay offices of the B.C. Assessment Authority and the B.C. Government Agents were frustrated by the lack of on-line title information for the majority of the land parcels at Suquash. Records of these very old parcels might possibly be disclosed by a search of the physical records held by the Land Title Office in Victoria, B.C., but such a search was not done during the present study.

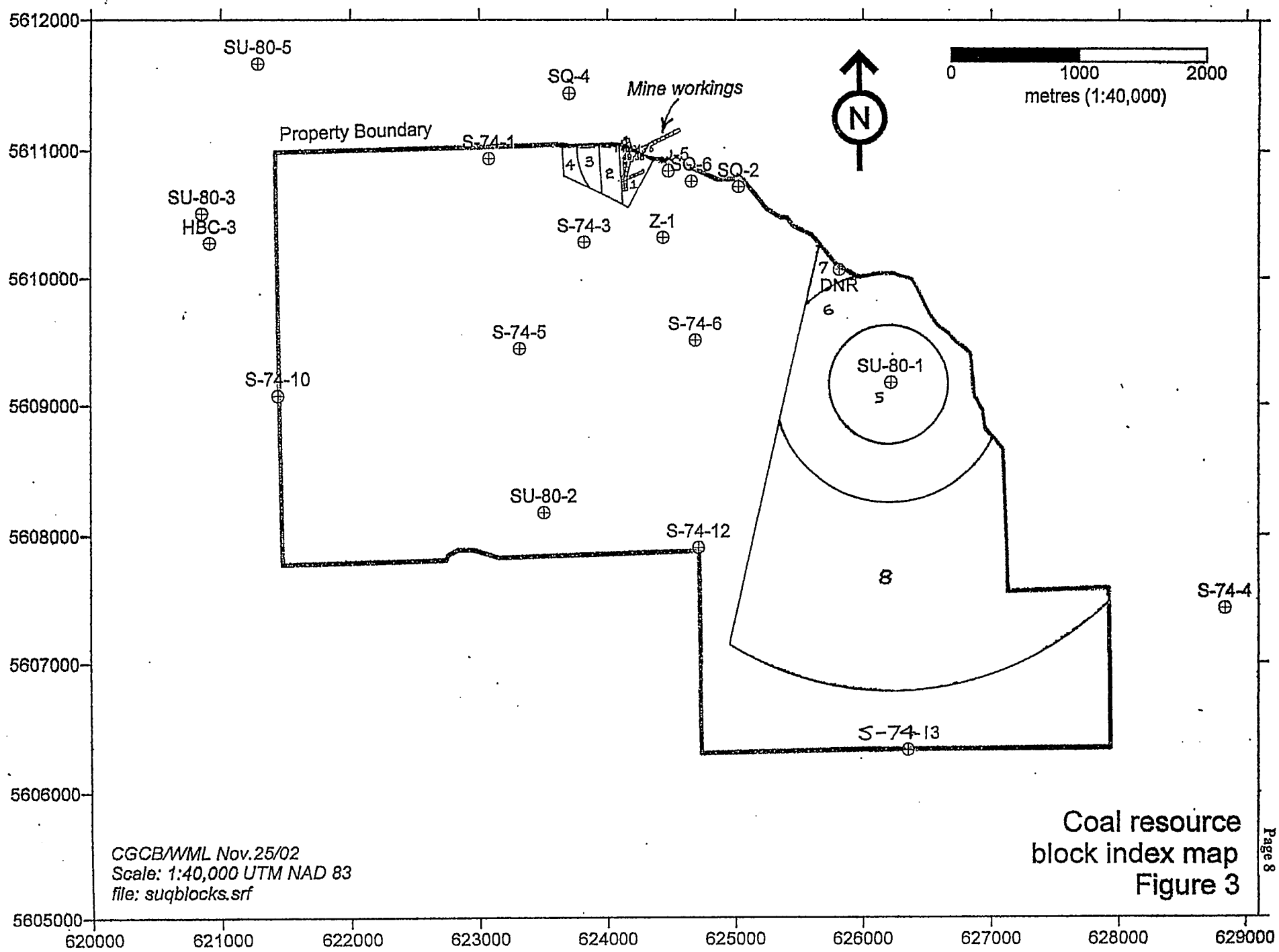
4.2.2 COALBED GAS OWNERSHIP STATUS

Crown coal licences *do not* convey the rights to coalbed gas or conventional natural gas and oil within the licences' boundaries. It appears that the Suquash property lies within an area of Crown oil and gas rights, but the author has not yet checked titles to confirm this supposition. No Crown oil and gas sales are known to have taken place at Suquash, and none have been announced for the near future.

To acquire Crown oil and gas exploration permits, Priority Ventures, (or any other company or person) would have to request that the provincial government post the permit area(s) for competitive bid, then succeed in making the highest acceptable bid for the permit(s).

4.3 LOCATION OF KNOWN COAL RESOURCES AND MINES RELATIVE TO THE PROPERTY

Figure 3 shows the outlines of coal resource blocks in relation to the Suquash coal property. Resource blocks are based on the boreholes shown on this drawing; no coal outcrops of mineable thickness have been found at surface within the property. A barrier zone of 150 metres width surrounding the old Suquash Colliery has been laid out, in keeping with the requirements of provincial coal-mining regulations regarding approach to old workings.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629000
SU-80-5
SQ-4
Mine workings
Property Boundary
S-74-1
SQ-6
SQ-2
SU-80-3
HBC-3
S-74-3
Z-1
7
DNR
6
S-74-5
S-74-6
SU-80-1
5
S-74-10
SU-80-2
S-74-12
8
S-74-4
S-74-13
0
1000
2000
metres (1:40,000)
N
CGCB/WML Nov.25/02
Scale: 1:40,000 UTM NAD 83
file: suqblocks.srf
Coal resource
block index map
Figure 3

4.4 ENVIRONMENTAL LIABILITIES

No specific environmental liabilities are known within the Suquash coal property. Past coal exploration (for example, the 1907-1912 drill programme discussed below) may have resulted in the local accumulation of junk, trash and abandoned equipment, but no sign of this has yet been found in the course of walking over the property.

Some old mining machinery may still be present at Suquash Colliery, but such machinery would probably be more likely to be regarded as an archaeological resource worthy of preservation for the public interest, rather than junk to be removed. To this end, Priority Ventures might face some opposition from the provincial Heritage Conservation Branch, if the firm wished to conduct exploration work immediately adjacent to the old minesite, which might pose a risk of disturbance to its archaeological resources.

4.5 ROYALTIES AND ENCUMBRANCES

The Suquash coal property is subject to a Crown coal production royalty, the amount and terms of which are set by the provincial government. The specific terms of Crown royalties were not investigated in the course of the present study.

No other encumbrances, agreements, or back-in rights concerning the Suquash coal licences are known to the author.

4.6 PERMIT REQUIREMENTS

Work programmes on coal licences must be conducted in accordance with the provisions of the *Mineral Exploration Code*, including the requirement to submit proposed programmes of exploratory work and reclamation for review and approval by the provincial Mines Branch.

For each programme, a *Notice of Work* must be filed, detailing the work which is proposed to be done, and the means by which environmental damage will be mitigated by the operator. Following examination of this document, the provincial Mines Branch may issue an exploration permit, which may include specific conditions concerning permissible work, special environmental precautions, and times at which work may be restricted owing to noise concerns or forest-fire hazard.

Crown coal licences do not have work commitments upon them, but they require the payment of an annual rental of $7 per hectare for the first five years. increasing to $10 per hectare in the second five years, and further increasing at $5 annually per hectare per five year period thereafter.

The annual rental due for the Suquash coal licences, based on the full area of 2016 hectares, will be $14,112 until 2007, at which time it will increase to $20,160. The annual expiry date of the coal licences, before which they must be renewed for the succeeding year's term, is February 15th.

5 ACCESSIBILITY, CLIMATE, LOCAL RESOURCES, INFRASTRUCTURE, PHYSIOGRAPHY AND FOREST COVER

In comparison with most other coal properties in British Columbia, access to the Suquash coal licences is moderately easy for exploration purposes, since they lie within an area which has been extensively logged in recent years, via well-constructed all-weather roads. Some of the roads are too rough for travel by passenger car, and some would require brushing-out before drilling equipment could traverse them, but the roads have mostly been well-constructed.

Most of the property is screened by unlogged landscape strips from public highways and the coastline; this reduces the visual and acoustic impacts of exploration activities. This accessibility comes with the concomitant drawback of high public visibility, requiring increased attention to visual and acoustic impacts of exploration activities.

5.1 ACCESSIBILITY

Other than one short segment of the paved Island Highway No.19, all of the roads at Suquash are private industrial roads (as shown on **Figure 4**), believed to be owned by Western Forest Products Ltd. Recreational road-use is allowed between the hours of 1730 and 0600 daily, but industrial use (such as passage of drilling equipment and supporting vehicles) would require the execution of a road-use agreement between Western Forest Products and Priority Ventures.

The logging roads are in turn connected to the Island Highway No.19, which gives access to the south Island and the mainland ferries, as well as to the nearby towns and villages.

No railway access is available to Suquash, since one has never been built, although in the 1920s surveys were made for a route running eastward from Suquash Colliery to a proposed shipping terminal at Lady Ellen Point. The railhead for Vancouver Island is at Courtenay, approximately 265 kilometres southeast of Suquash via Highway 19.

The Suquash area is served by a regional airport at Port Hardy, about 25 kilometres by road from the property.

5.2 CLIMATE

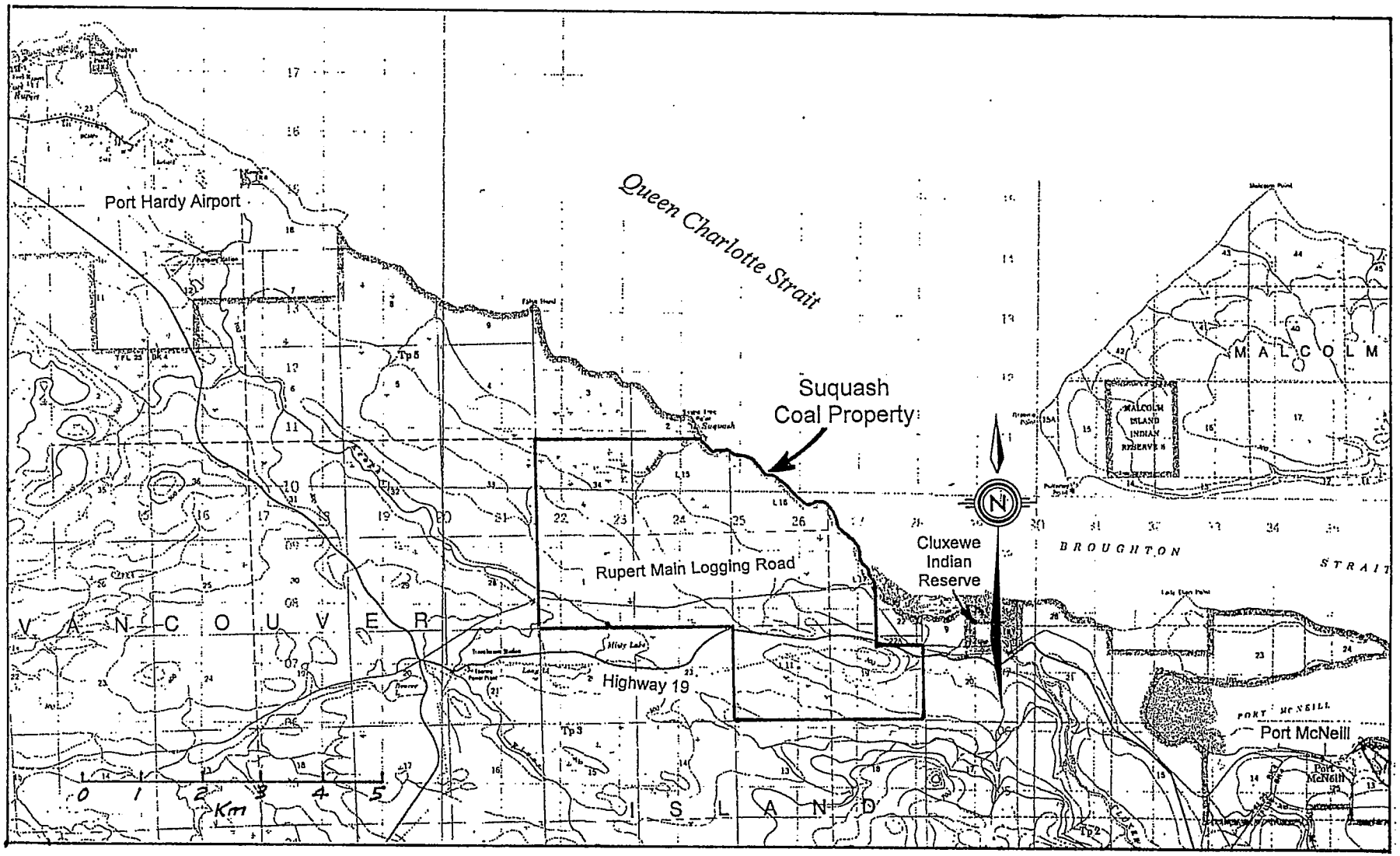
The Suquash property lies within the Submontane Very Wet Maritime Coastal Western Hemlock biogeoclimatic subzone (Green and Klinka, 1994). Characteristic of this subzone is a temperate, wet, humid climate with mild winters and cool summers, with much more rain than snow.

The summers are somewhat drier than the winters at Suquash, but rain can occur in any season, and rainless periods longer than a week are probably rare. The winter storm season extends from early October to late May. Storms can bring high winds, occasionally to hurricane force, and rapid rainfall of up to 100 mm per day.

5.3 LOCAL RESOURCES

Timber for mining purposes is readily available on the ground at Suquash, but its use would have to be negotiated with Western Forest Products Ltd.

Owing to the wet climate, water is in abundant supply at Suquash, but potable water may have to be purchased and trucked from Port Hardy or Port McNeill, as surface water supplies are probably too turbid, biologically contaminated, or contain excessive tannins.



PRIORITY VENTURES LTD.	
Suquash Coal Property	
Topography and Access Map	
Base: NTS 92 L/11	Scale: 1:100,000
CGCB/WML Nov. 21/02	UTM NAD 27
Westwater Mining Ltd.	Figure 4

5.4 INFRASTRUCTURE

The North Island has had a long and rather chequered history of mining activity, ranging from the early Hudson's Bay Company diggings at Suquash in the late 1840s and early 1850s, and culminating in the operation of the recently-closed large open-pit Island Copper Mine on Rupert Inlet, about 18 km southwest of Suquash. Although some of the support activities (such as equipment suppliers) which were explicitly devoted to mining are now concentrated further down-Island in Campbell River, most of the elements of mining infrastructure are available within reasonable distances from the property, as discussed below.

5.4.1 SURFACE ACCESS FOR MINING PURPOSES

Surface rights at Suquash are privately held by Western Forest Products Ltd. (possibly with some inholdings of Crown forest land), who operate a tree farm under a managed forest tenure. Priority Ventures has not yet requested surface access from Western Forest Products, but it is considered likely that the two firms could come to some reasonable agreement for exploratory access, given that the bulk of the forest lands have already been logged-off in recent years.

5.4.2 ELECTRICAL POWER SUPPLY

Electrical power at 14.4 or 25 KV is available along the public highways, from B.C. Hydro's Keogh switching station. Regional transmission voltages are 138 and (possibly) 230 KV, to judge by the construction of the transmission-lines. Although Hydro has a gas-turbine power plant on the Island Highway near the Keogh River crossing, the plant is not presently being used, and power for the area comes via the main transmission-line from farther south on the Island.

No electrical power lines are presently installed within the Suquash coal licences, other than along the highway. There is no sign that power lines ever did reach Suquash Colliery, which generated its own power from an on-site generator throughout its history.

5.4.3 MINERS AND TRADESPEOPLE

Suquash townsite itself has long been abandoned, and there are no places of habitation within Priority Ventures' coal licences. Some retirees from Island Copper may still live at Port Hardy or Port McNeill, but most miners would have to be recruited from further south at Campbell River and in the Comox Valley. Other tradespeople, who might in better times be working in the forest industry, are probably more readily available owing to the prevailing depression in local economic conditions.

5.4.4 MINE WASTE AND TAILINGS DISPOSAL

Mine wastes and tailings could be readily stored on the ground within the Suquash property, but care would have to be taken to ensure that groundwater supplies were not contaminated by leaching or acid rock drainage. The frequent swamps and creeks within the property may constrain storage of waste and tailings to a few smaller areas of higher, drier ground.

Since the Suquash property lies within an area of high seismic risk, waste and tailings impoundments would have to be designed to a high standard in order to ensure stability during earthquakes.

5.4.5 EQUIPMENT AND SUPPLIES

Heavy industrial and construction equipment, including excavation and road-building equipment, is available in the cities of Campbell River and Courtenay, about three hours south of Suquash via Highway

19. Mining and drilling supplies are available from distributors in Greater Vancouver, approximately nine hours away from Suquash by road and ferry.

5.4.6 PLANT SITES

Potential plant sites for mining and coal preparation have not been identified in detail, since the Suquash property is still at a very early stage of exploration.

5.4.7 TELECOMMUNICATIONS

Landline telephone services are provided to Port McNeill and Port Hardy by Telus, from microwave facilities near the respective centres of population. Cellular telephone services are provided by Telus, but Suquash lies within a 'fringe' area for cellular reception.

5.5 PHYSIOGRAPHY

The Suquash coal property lies within the Nahwitti Lowland, along the southwestern shore of Queen Charlotte Strait, which in turn opens northwestward into the Pacific Ocean.

The Nahwitti Lowland consists of gently-rolling country incised by a rectilinear, northwest-elongate network of stream and river channels, interspersed with extensive swamps, both open and treed. Truly dry ground is rather scarce near Suquash, and is confined to isolated bedrock hillocks and raised-beach ridges.

Elevations within the coal licences range from sea level along the shoreline, to about 110 metres above sea level in the rolling hills south of Highway 19 and west of Cluxewe River.

5.6 FOREST COVER

The Suquash coal licences are checkerboarded by a patchwork of recent cut-blocks, which have removed most of the original forest cover along the higher ground between the valleys of the Keogh and Cluxewe rivers. As such, vegetation cover ranges from grasses, sedges and juvenile cedar and fir trees in the cutblocks, to mature and senescent hemlock, cedar, white pine and Sitka spruce in the remaining uncut forest. Roughly 70% of the coal licence area has been logged-off.

Undergrowth in the mature forest is generally sparse, but locally consists of salal, devil's-club and Oregon-grape. Along the shorelines, grasses and baldhip roses are locally common. Beneath mature forests, the ground is typically littered by a thick accumulation of windfall, sometimes up to 5 metres thick above the peaty, sodden surface of the ground. Such country is truly daunting to would-be explorer.

6 HISTORY

6.1 PREVIOUS OWNERSHIP

Coal rights to the Suquash lands were initially conveyed by the British Crown to the Hudson's Bay Company, as part of an ambitious scheme of colonisation during the 1830's. The Hudson's Bay Company retained rights to the Suquash coalfield until at least the mid-1870's, but by 1890 the properties had begun to come into the hands of various private firms.

In or about 1890, the Oregon Improvement Company acquired coal rights to part of the Suquash Coalfield, centred on the 'Fort Rupert coal lands' near the mouth of the Keogh River, west of Suquash.

In 1907, the original Suquash property was acquired by South Wellington Coal Mines, Limited of Victoria, B.C. In 1909 this firm was reorganised as Pacific Coast Coal Mines, Limited (PCCM), also headquartered in Victoria. The company suspended work at Suquash when the First World War was declared, but briefly reopened the mine in the summer of 1920 for rehabilitation and examination by engineers. PCCM entered liquidation in 1923, and the Suquash mine stood idle.

In 1925, West Coast Collieries, Limited acquired the mine, but apparently did not work it.

The mine remained closed until 1951, at which time it was acquired by Suquash Collieries Limited who reopened and rehabilitated the mine, but did not recommence commercial production of coal. Suquash Collieries ceased work in November, 1952, and the mine has remained closed ever since.

In the mid 1970s, two coal licences covering the old mine were acquired by Cobre Exploration Ltd., and 51 licences surrounding them were acquired by the British Columbia Hydro and Power Authority. B.C. Hydro and Cobre apparently let their licences lapse, because by 1980 the property had been acquired by Ramm Venture Corporation, and optioned to Filtrol Minerals Ltd. The Ramm/Filtrol joint venture and the coal licences which formed its basis eventually lapsed, probably in the late 1980s or early 1990s, since the work done in 1980 would have served to satisfy any work commitment on the coal licences for quite some time.

In recent times, the Suquash coalfield appears to have remained unlicenced until Priority Ventures applied for their coal licences in 2001.

6.2 PREVIOUS EXPLORATION

Considerable previous exploration work has been done at and adjacent to the Suquash coal property. Most of the work has involved core- and rotary-drilling (as shown on **Figure 5**), but fairly extensive underground workings have also been developed at Suquash Colliery, near the mouth of Suquash Creek (as shown on **Figure 6** and **Map 1** of this report).

As it stands, the Suquash coal property has been fairly sparsely explored. Twelve boreholes have been drilled within the coal licences; logs are available for eleven of them (although locations are known for only ten of them). Three boreholes have been drilled on the property lines bounding the coal licences, and five more boreholes have been drilled within a kilometre of the property; logs are available for all of these boreholes.

Including the boreholes drilled on the property lines, the average borehole spacing within the Suquash coal licences is one hole per 134 hectares. Ordinarily, this would be quite tight spacing for early exploratory work within a coalfield, but quite a few of the holes did not reach the base of the Suquash coal-measures, let alone the pre-Cretaceous basement, and they therefore cannot be regarded as completely valid tests for coal resources of interest for underground mining.

6.2.1 PREVIOUS EXPLORATION BY PRIORITY VENTURES LTD.

Priority Ventures has done no previous work at the Suquash property, other than commissioning a desk study of its geology by Westwater Mining Ltd. (Cathyl-Bickford, 2001).

6.2.2 PREVIOUS EXPLORATION BY OTHER FIRMS

Six other firms have conducted prior tangible exploration at or near Suquash. In order of precedence, they are: the Hudson's Bay Company, the Oregon Improvement Company, South Wellington Coal Mines, Pacific Coast Coal Mines, B.C. Hydro, and Filtrol Corporation.

6.2.2.1 Hudson's Bay Company

The Hudson's Bay Company (HBC) first learned of the presence of coal near Suquash in 1835, when traders from the Kippase First Nation mentioned its existence to the company. In 1846, Commander G.T. Gordon of the Royal Navy made a reconnaissance of the suspected coalfield, and found three coal beds on the north shore of Port McNeill, and "another rich seam" (Gordon, 1846) along the beach "about eight miles further down the coast to the north-west... [at] Baillie Hamilton Bay" -- probably a now-abandoned name for the shallow bay at Suquash.

In 1852 and 1853, HBC drilled for coal at several locations within the coalfield; logs of three of these holes (two at or near Suquash, and one further northwest near the mouth of the Keogh River) were collected and published in 1887 by G.M. Dawson, of the Geological Survey of Canada.

Of the two holes at or near Suquash, one hole (HBC-2) is only known in general terms to have been on the beach at Suquash; another hole (HBC-3) was drilled inland from Suquash and appears to have been found on the ground by Hope Engineering's staff in 1952 or 1953 (Hope and Louttit, 1953). HBC-2 and HBC-3 are both quite shallow boreholes, and neither one encountered any coal of potential interest by modern standards.

The Hudson's Bay Company also drove at least one tunnel and sank at least one prospect shaft at Suquash; the latter shaft still stands open (although water-filled) at the base of a ridge near the coastline. No geological records of this work have been found to date.

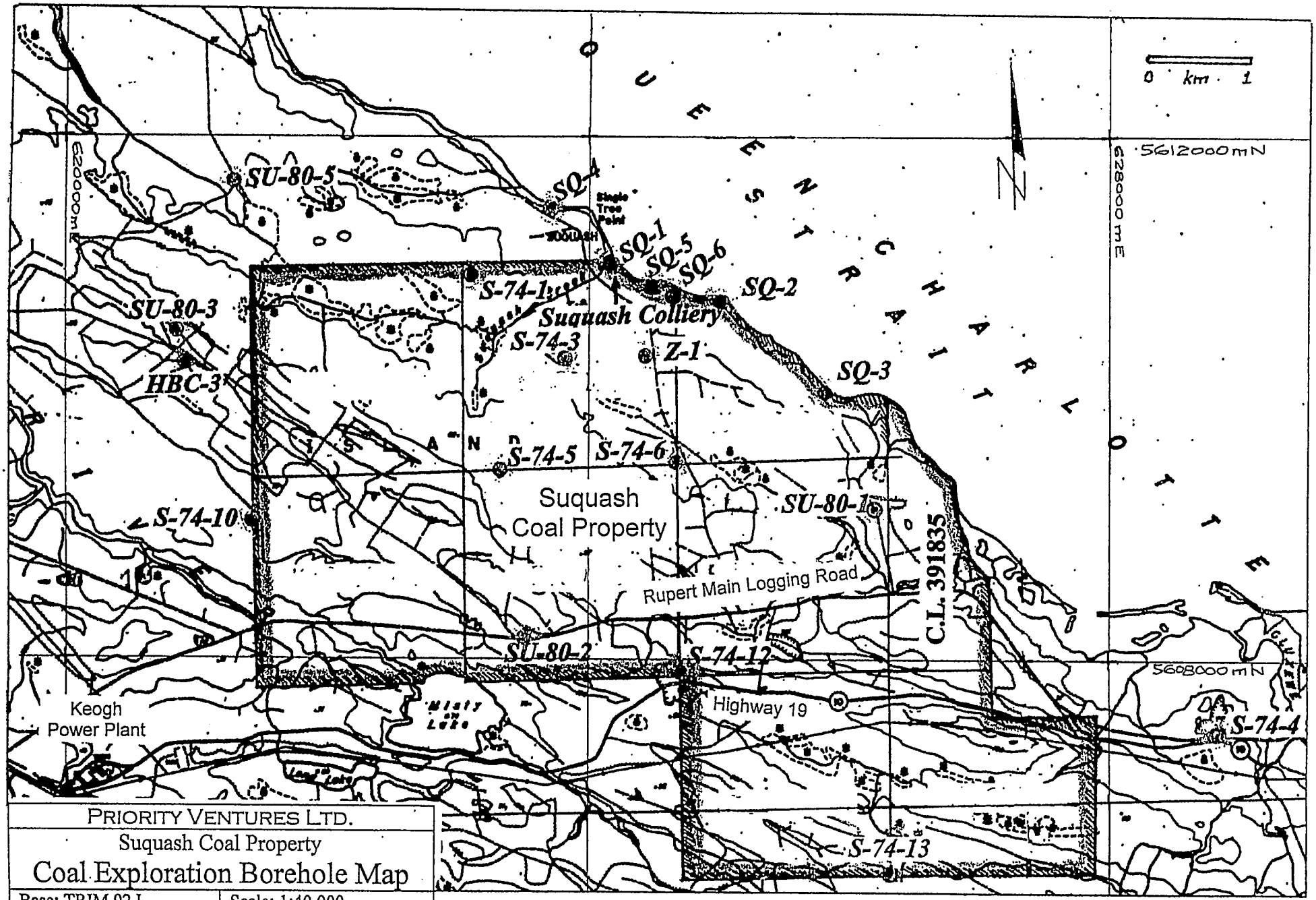
Oregon Improvement Company

In or about 1890, the Oregon Improvement Company (OIC) reportedly drilled for coal on the Fort Rupert coal property, which lay between Suquash and the mouth of the Keogh River.

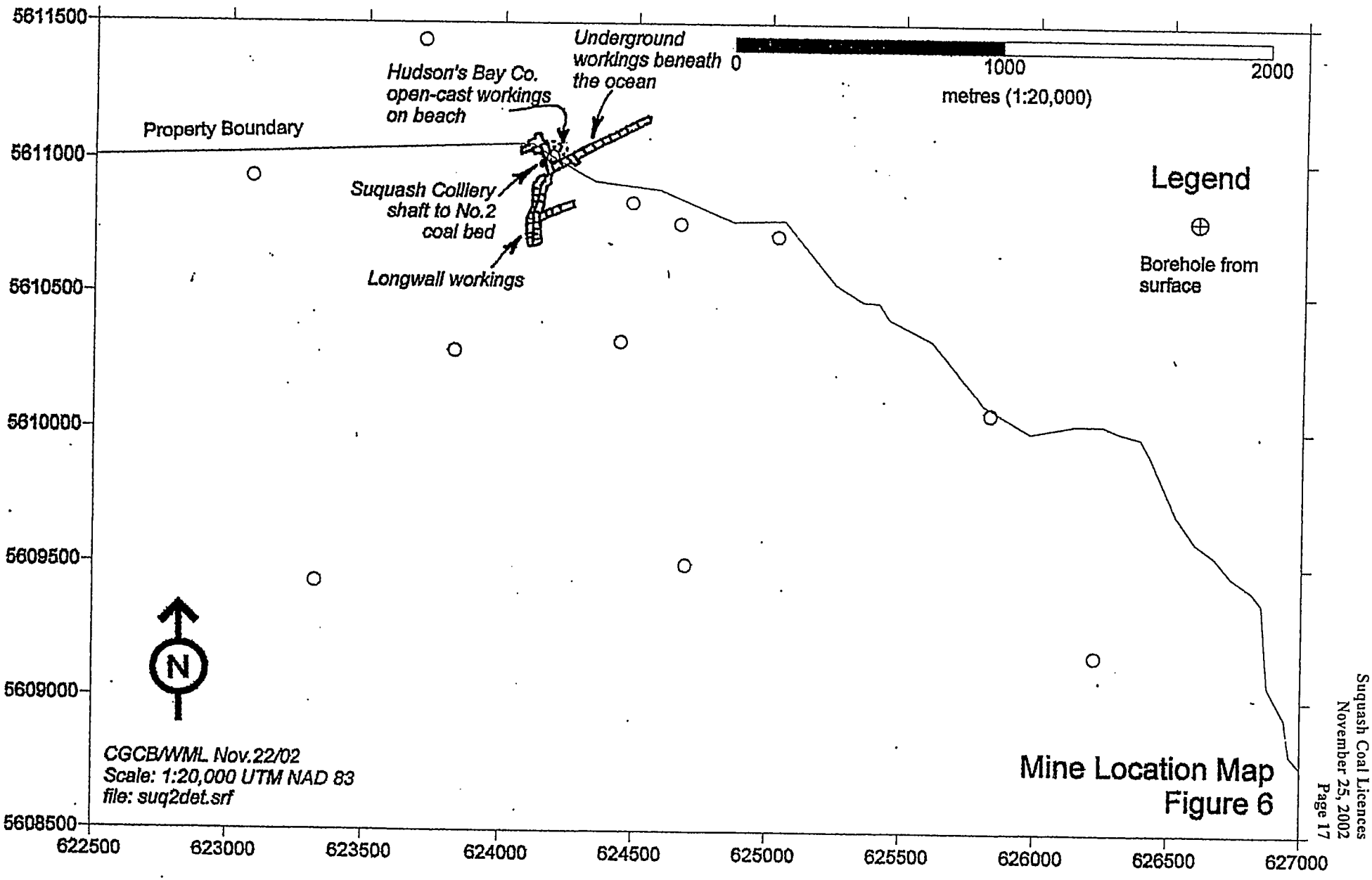
According to a report by the B.C. Exploration Syndicate (ca. 1918), which has archived in the Joseph Daniels papers at the University of Washington Archives (UWA) in Seattle, in 1890 OIC drilled at 2100-foot (640-metre) borehole "which proved 21 seams of coal in all, three of which are workable, i.e. - at 200 feet a 4 foot seam, at 600 feet a 6 foot seam, at 1750 feet an 8 foot seam." Neither a location nor a complete log of this borehole have been found thus far, despite the present author having spent several days searching the collections at UWA.

However, Buckham (1953) did consider that there was evidence that a borehole had been drilled near Suquash in 1890, as well as a later borehole in 1898. Furthermore, Hope and Louttit (1953) report an old borehole southeast of Suquash Colliery (mapped as Z-1 on **Figure 5**, although Hope and Louttit did not give any specific designation in their 1953 report), which could conceivably be the 1890 borehole reported by the B.C. Exploration Syndicate, but in the absence of an authoritative log for the hole there is no way to test this possibility.

The reader of this report is cautioned that, until a log and location have been found for the reported 2100-foot borehole, its relevance to Priority's present Suquash coal property is uncertain.



PRIORITY VENTURES LTD.	
Suquash Coal Property	
Coal Exploration Borehole Map	
Base: TRIM 92 L	Scale: 1:40,000
CGCB/WML Nov. 23/02	UTM NAD 83
Westwater Mining Ltd.	Figure 5


5611500
5611000
5610500
5610000
5609500
5609000
5608500
622500
623000
623500
624000
624500
625000
625500
626000
626500
627000
Underground workings beneath the ocean
Hudson's Bay Co. open-cast workings on beach
Property Boundary
Suquash Colliery shaft to No.2 coal bed
Longwall workings
0
1000
2000
metres (1:20,000)
Legend
Borehole from surface
N
CGCB/WML Nov.22/02
Scale: 1:20,000 UTM NAD 83
file: suq2det.srf
Mine Location Map
Figure 6

6.2.2.3 South Wellington Coal Mines, Limited

In 1907 and 1908, South Wellington Coal Mines, Limited (SWCM) drilled four boreholes along the coastline of Queen Charlotte Strait, at or near HBC's old Suquash mine. Three of the holes (SQ-1, SQ-2 and SQ-3) lie within the Priority Ventures property. The fourth hole (SQ-4) lies about 0.4 km north of the property.

Logs of all four of SWCM's boreholes are available in the Joseph Daniels (Daniels, n.d.) and George Watkin Evans collections at UWA in Seattle; they are also available, in excerpted form, in the B.C. Hydro report (Saunders, 1975). Slight differences between these logs may reflect accumulated transcription errors since 1908; for purposes of the present study, the Daniels logs were used, as Joseph Daniels was adjudged by the present author to be the most credible collector and reporter of geological data.

6.2.2.4 Pacific Coast Coal Mines, Limited

Pacific Coast Coal Mines, Limited (PCCM) was the successor company to SWCM. In 1913, PCCM drilled two boreholes (SQ-5 and SQ-6) within the Suquash coal property, between the earlier sites of boreholes SQ-1 and SQ-2.

SQ-5 and SQ-6 were relatively shallow boreholes, probably drilled to aid location of the intended new shaft at Suquash Colliery. Logs of SQ-5 and SQ-6 are available in the Joseph Daniels collection at UWA (Daniels, n.d.).

6.2.2.5 British Columbia Hydro and Power Authority

In 1974, the British Columbia Hydro and Power Authority (B.C. Hydro) commissioned Dolmage Campbell and Associates Ltd. to explore the Suquash coalfield. Ten diamond-drill holes were drilled on Hydro's behalf throughout the coalfield; seven of these holes (S-74-1, -3, -5, -6, -10, -12 and -13) lie within or along on the boundaries of the present Suquash coal property, and another hole (S-74-4) lies near the mouth of Cluxewe River, about 0.9 km east of the property. The other two holes (S-74-2 and -7) lie farther northwest and southeast respectively.

Logs of the B.C. Hydro boreholes are presented in an exploration report by Saunders (1975a). Some inconsistencies occur between the geological descriptions of the cores, which appear to be summaries only, and the notes concerning samples taken in each hole. Where inconsistencies were noted by the present author, the sampling notes were assumed to be more authoritative.

6.2.2.6 Filtrol Minerals Ltd.

In the summer of 1980, Filtrol Minerals Ltd. (FML) optioned 16 coal licences from Ramm Venture Corporation, and conducted a drilling programme on them. Filtrol used air-rotary drilling rigs to drill five holes (SU-80-1 through -5), with an aggregate length of 1268 metres (Summersgill, 1980).

Of the five holes, only two (SU-80-1 and -2) lie within the Priority Ventures coal licences, and only SU-80-1 penetrated through the Drift cover and into the underlying Suquash coal-measures. Two other holes (SU-80-3 and SU-80-5) respectively lie 500 metres west and 700 metres north of Priority Ventures' property.

With the exception of S-80-2, which was abandoned in Drift due to buckling of its surface casing, the Filtrol holes were geophysically logged, with a suite of gamma, density and focused-beam logs provided by Roke Oil Enterprises Ltd. Gamma-density logs from SU-80-1 and SU-80-3 are shown on **Chart 1** (in pocket accompanying the present report).

6.2.3 PREVIOUS GOVERNMENTAL SURVEYS

The first governmental survey of the Suquash coals was done by officers of the Royal Navy in 1846 (Gordon, 1846), as part of a search for sources of steam-coal for naval vessels and merchant ships in the northwest Pacific Ocean.

In 1886, George M. Dawson examined the Suquash coals for the Geological Survey of Canada (Dawson, 1887), and he also collected and published the records of some of the boreholes which had been drilled near Suquash in the early 1850s by the Hudson's Bay Company.

In 1911, Charles H. Clapp, acting as a consultant to the Geological Survey of Canada, made a very brief examination of the recently-opened Suquash Colliery (Clapp, 1912).

In the late 1960s, stratigrapher Jan Muller and paleontologist J. 'George' Jeletzky resurveyed the geology of northern Vancouver Island, including the coal-measures near Suquash (Muller, 1967; 1969; 1970; Jeletzky, 1969; 1970; Muller and others, 1974). Although not all of Jeletzky's conclusions on stratigraphic position and age of the Suquash coal-measures were accepted by Muller, their work taken as whole forms the basis for present understanding of the Suquash Formation.

In the late 1990s, a large team of stratigraphers and paleontologists from the British Columbia and Canadian geological surveys again remapped parts of northern Vancouver Island, including the western fringe of the Suquash coalfield (Nixon and others, 2000). The stratigraphic nomenclature presented by Nixon and others has been adopted for use in the present study, with the exception that the Suquash Formation (which they appear to have abandoned as a stratigraphic entity) has been retained here on grounds of practical utility.

6.2.4 HISTORICAL COAL RESOURCE ESTIMATES

Only four historical coal resource estimates are known to have been reported for the Suquash area, by Joseph Daniels (1919) for Sydney E. Junkins Co. Ltd., George Watkin Evans (1925) for the Southern Pacific Company, C.R. Saunders (1975a) for Dolmage Campbell & Associates, and in turn Dolmage Campbell & Associates (1975) for B.C. Hydro.

None of these estimates was reported in sufficient detail to meet modern standards.

6.2.4.1 Joseph Daniels' 1919 estimate

Daniels' estimate covers a coal-bearing area of 3771 acres at Suquash, of which 2627 acres consist of areas extending beneath the waters of Queen Charlotte Strait. By modern standards, his reporting was insufficient, since he did not report details of radii from points of investigation; nor did he specify the geological controls underlying the estimate.

Daniels considered the average thickness of coal in the "Suquash seam" to be 3 feet 9 inches, and the recoverable coal content to be 1000 tons per acre-foot (however, he did not mention whether short or long tons were being considered). On that basis, he estimated that the area contained 14,141,250 recoverable tons of coal, and that coal in place was 24,747,187 tons.

The reader of this report is cautioned that Daniels' estimate includes submarine areas which are not contained within the present property boundaries; it probably also extends into on-land areas which are not presently controlled by Priority Ventures Ltd.

6.2.4.2 George Watkin Evans' 1925 estimate

Evans' estimate considers two areas: the 3,000 acres which he viewed as having been tested by existing drill holes and the mine workings of Suquash Colliery, and the entire 9,312 acres which at the time constituted the Suquash property.

As was the case with the earlier estimate by Daniels, Evans' estimate was not done to modern standards (it lacked details of radii from points of investigation, and did not specify the geological controls

underlying the estimate.) Evans did, however, express his misgivings with rare candour (Evans, 1925, pages 38 and 39):

> *"In a coal property that has been as little prospected as this one there is not a great deal to guide a person in arriving at a tonnage estimate. In the first place, we do not know definitely the number of commercial coal beds in the formation and if we assume that the Suquash Bed is the only one, we have to make a further assumption as to its continuity and character.*
>
> *You can see, therefore, that any tonnage estimate must be based on arbitrary factors. I have indicated that so far as the mine workings are concerned the bed averages 4 feet and 3 inches. This will average about 5000 tons to the acre and allow for certain losses. There is probably 3000 acres tested by the drill holes and the mine workings, so that if we use these figures we would have in round numbers 15,000,000 tons of coal for this one bed. If we assumed that the entire 9312 acres of the holdings were underlaid with 4'3" of recoverable coal, then the tonnage would be a little over 46,000,000 tons. Any additional beds would add to the tonnage. It would probably be safe to state that the tonnage in this property might range from 10,000,000 to 45,000,000 and after being thoroughly prospected it might contain a much greater tonnage and on the other hand further underground prospecting might prove that the bed becomes so badly split with impurities as to render it of no value."*

Like Daniels, Evans made no mention of whether his estimate was in long tons or short tons.

The reader of this report is cautioned that Evans' estimate probably includes portions of the Suquash Basin which are not controlled by Priority Ventures Ltd.

6.2.4.3 Saunders' 1975 estimate

Working on behalf of Dolmage Campbell & Associates for B.C. Hydro in 1975, C.R. Saunders calculated coal reserves for the Suquash coal deposit. As with earlier estimates, Saunders' estimate does not meet modern standards in that he did not specify the geologic controls underlying the estimate. He did, however, segregate tonnages based on distance from control points, as follows (Saunders, 1975, page 19):

> *"The criteria employed in calculating reserves for the Suquash deposit are similar to those used previously for the Comox reserve calculations. The main criteria are:*
>
> *Minimum zone thickness of three feet.*

Tonnage factors:	*Ash (%)*	*Specific gravity*	*Tonnage Factor (cu.ft./ton)*
	10	*1.43*	*22.4*
	20	*1.56*	*20.5*
	30	*1.69*	*19.0*
	40	*1.82*	*17.6*
	50	*1.95*	*16.4*
	60	*2.08*	*15.4*
	70	*2.21*	*14.5*

Proven Reserves - coal occurring in three or more boreholes spaced not more than 1600 feet apart, and for which there is a relatively high degree of confidence in the correlation of the seam or zone between holes; a maximum projection of 800 feet.

Probable Reserves - coal projected a maximum of 1600 feet beyond proven coal, or, coal occurring in three or more boreholes spaced not more than 3200 feet apart, and for which there is a moderate degree of confidence in the correlation of the seam or zone between holes.

Possible Reserves - coal projected beyond probable coal or beyond one or more borehole intersections for a maximum distance of 3200 feet. Reserves for isolated drill intersections of coal seams or zones for which correlation cannot be established.

Reserves have been calculated only for the nine definable zones (0, 1, 1A, 2, 2A, 2B, 3, 4, 5). Where sample thickness is less than three feet, the calorific value and ash content have been determined for the minimum three feet thickness by assuming the non-sampled portion to contain zero calorific value and 100 percent ash. This should give conservative results."

Saunders calculated reserves based on three different conditions (*op. cit.*, p.20):

"1. No heat or ash quantity limits.

2. Only those portions of the zones with calorific values greater than 4000 Btu per pound and ash content less than 60 percent.

3. Only those portions of the zones with calorific values greater than 6000 Btu per pound and ash content less than 50 percent."

Saunders further noted (*op. cit.*, p.20):

"It must be realized that these figures are based on somewhat sparse and irregularly spaced data and consequently averages, (which in most cases are weighted), could contain considerable bias in some instances. However, they do serve to indicate the general coal zone quality and quantity in the Suquash Basin.

In rounded-off figures, the Suquash Basin contains the following coal zone reserves:

(A) All correlated intersections regardless of grade

300 million short tons @ 4500 Btu per pound and 60 percent ash.

(B) Correlated intersections containing over 4000 Btu per pound and under 60 percent ash

150 million short tons @ 5500 Btu per pound and 50 percent ash.

(C) Correlated intersections containing over 6000 Btu per pound and under 50 percent ash

50 million short tons @ 6900 Btu per pound and 44 percent ash.

For a minimum three feet thickness the highest calorific value is 8080 Btu per pound and the lowest ash content is 33.3 percent."

The three-foot (ca. 0.9 metres) minimum thickness used by Saunders is less than the 1.5-metre minimum thickness recommended in GSC Paper 88-21. Conversely, Saunders used more conservative radii-of-influence for his control points than is called for by Paper 88-21.

The reader of this report is cautioned that Saunders' estimate includes portions of the Suquash Basin which are not controlled by Priority Ventures Ltd.

6.2.4.4 Dolmage Campbell's 1975 estimate

In their report to B.C. Hydro, concerning coal resources of the province of B.C. as a whole, Dolmage Campbell & Associates reported "possible reserves" of 50 million tons of coal (long vs. short tons not explicitly stated, but probably short tons); this figure appears to have been drawn from the earlier report by Saunders (1975a), and should be interpreted with the same cautions and limitations.

The reader of this report is cautioned that Dolmage Campbell's estimate includes portions of the Suquash Basin which are not controlled by Priority Ventures Ltd.

6.2.5 HISTORICAL COAL PRODUCTION

Two mines are known to have been worked at Suquash: the early open-cast mine of the Hudson's bay Company, and the later underground mine at Suquash Colliery. Descriptions of the mines and their working conditions are taken from the references cited.

Inasmuch as the Suquash mines were active many years ago, the present author has no direct experience of their conditions and must, therefore, rely on the earlier reports made by other workers. Some of the historic data (most notably, description of coal bed sections being worked) are contradictory, despite appearing to have been collected at the same points within the mines. The author hereby disclaims any and all responsibility for the accuracy of such reports.

6.2.5.1 Hudson's Bay Company workings

Open-cast mining of coal from the beach and foreshore at Suquash commenced in 1849, and continued until early in 1852 (Hope and Louttit, 1953). The coal was dug by First Nations miners who traded the coal with the Hudson's Bay Company, and who probably acted at least partially under the direction of the company's resident colliers.

The miners worked the Suquash No.1 coal bed (alternatively known as the 'Hudson's Bay Seam'), which crops out at the mouth of Suquash Creek. No trace remains of the open-cast workings, but fairly fresh coal remains exposed in the intertidal zone, where it appears to be more resistant to erosion than the underlying and overlying strata.

Some test-pitting was done in search of the overlying Suquash No.0 coal bed, and a water-filled shaft which probably reached this coal bed is still exposed beneath the forest at the base of a ridge a few tens of metres inshore from the beach. At least one tunnel was also driven at Suquash, probably by the HBC, but it is not known what was found in the tunnel or whether any coal was produced from it.

6.2.5.2 Suquash Colliery

Following completion of the 1907-08 diamond-drill programme, South Wellington Coal Mines, Limited, commenced sinking a shaft on the coastline, just south of the mouth of Suquash Creek, in order to access the Suquash No.2 coal bed (alternatively known as the Suquash Seam). The shaft lies within the northeastern corner of Priority Ventures' coal licences, and its workings extend southwestward within the coal licences, northward into adjoining land not owned by Priority, and northeastward beneath the waters of Queen Charlotte Strait (again, beyond the boundaries of the present coal licences).

During the author's recent reconnaissance of the property, a southward-fanning shaft-head dump was relocated within a now-forested area about fifty metres west of the shoreline and close by the south bank of the creek. The shaft itself was not seen by the author, but photographs presented by George Watkin Evans in his 1925 report show that the shaft was located close by the northern end of the dump.

Map 1 (in pocket of this report) is a geological plan of the mine, compiled from maps presented by Daniels (1919b) and Evans (1925). **Chart 2** (following) presents a proposed correlation of the numerous coal bed sections which were measured by Daniels and others along the southwestern side of the mine.

North

South

Borehole SQ-1

HA DA HB H5 H4 H3 H2 DB HC DC H1 H6 HD DD HE DE DH DI

No. 2 Rider coal

Rider Parting

No. 2 coal (upper leaf)

Lower Parting

No. 2 coal (lower leaf)

Co with small rock bands 20"

Co with bands of sh, bo, etc. 38"

Sh with coal band 12"

Co with bone bands 16½"

Note: borehole SQ-1 lies east of line of section, and is here inserted for comparison.

vertical exaggeration 94.49 to 1

0 30 60 90 120 150
horizontal metres

vertical
inches 20 10 0
centimetres 50.8 25.4 0

Legend:

- Co Coal
- Cb.sh Carbonaceous shale
- Bo Bone
- Sst Sandstone
- Bo.Co Bony coal
- Fc Fireclay
- Sh Shale

PRIORITY VENTURES LTD.

Suquash Coal Property

Correlation of coal bed sections as reported from southwestern side of Suquash Colliery

Drawn by: C.G. Cathyl-Bickford, P.Geo.	November 24, 2002
Data from reports by G.W. Evans, J. Daniels and Hope Engineering Ltd.	Scales: as shown
Westwater Mining Ltd.	Chart 2

Suquash Colliery's shaft was collared just above the Suquash No.1 coal bed, and probably bottomed just below the Suquash No.2 coal bed. No log of the shaft has been found, but the nearby borehole SQ-1 serves as an adequate basis for correlation of the coal beds.

All of the mine's workings (other than its shaft) were driven in the No.2 coal bed (including the closely-adjoining No.2 Rider coal, which throughout much of the mined area has come close enough to the underlying No.2 coal that the two coal beds have been mined as if they were a single bed). Most of the mine's workings were of an exploratory or development nature, but an advancing longwall face was commenced on the southwestern side of the mine, working updip within the conjoint No.2/2R coal.

The following description of the mine workings is quoted from Daniels' report (*op. cit.*, pages 84 and 85); this appears to have been the most complete mine description reported by someone who actually viewed the mine's workings at first hand:

> *" A small shaft 6 feet by 10 feet in the clear taps the Suquash seam at 170 feet. This shaft is about 200 feet from the shoreline. From the shaft a pair of levels has been driven in the coal for 250 feet on each side, and from these, narrow places have turned up the dip of the coal for 250 feet apparently with the intention of leaving a large shaft pillar. A small section in the northwest portion of this shaft pillar appears to have been started away as longwall workings but was soon abandoned. Near the shaft a double-entry slope was driven on the dip of the coal for 1300 feet, but it was also abandoned. It is believed that the seam was not of commercial quality in the abandoned sections. These workings were not accessible at the time of examination and the mining conditions could not be determined.*
>
> *The major part of the mine development was along the levels extending south of the shaft. These were driven for 800 feet beyond the fault, a total distance of 1100 feet. Longwall workings were opened on the rise side of the upper or main entry and practically all of the mine production from 1912 to 1914 appears to have come from this section. Mine maps dated 1913 indicate an attempt to carry the longwall face directly from the end of the levels without leaving entry pillars.*
>
> *In 1913, an elaborate plan of future development was projected. This involved the sinking of a large, new shaft on the cliff east of the old shaft and the opening out of a large working area on the east side of the old level. The new shaft was expected to reach coal at 285 feet. The project called for levels at the new shaft bottom, 1100 feet distant from the old shaft entries, with a connecting slope between them. The old shaft was to be used as an air shaft and the coal in the intermediate area was to be lowered down the new slope to the shaft level and then hoisted up the main shaft.*
>
> *The new slopes were started at a point 500 feet inside of the fault and appear to have been driven 300 feet before the mine was closed in 1914. They had been partially dewatered during the recent examination and were open for about 60 feet. The new shaft is reported to have been sunk 18 feet into solid rock before work was stopped by the war."*

Daniels goes on to mention the roof conditions of the mine workings (op. cit., pages 86 and 87):

> *"The roof of the seam is very strong and little timber appears to have been used except in the cribbing or cogs which were used to maintain the roadways or "gates" into the longwall section."*

George Watkin Evans' 1925 report on the property does not include a first-person description of the mine workings, since the mine was flooded at the time of his visit and on grounds of expense he did not consider it advisable to pump the mine out (Evans, 1925, page 1).

Evans did, however, make a close inspection of the mine's surface facilities (*op. cit.*, page 38):

"It is reported that $17,000 to $20,000 has been spent on a very attractive bungalow, built at the edge of the bluff, over-looking the sea. It is patterned after a hunter's lodge with rustic trimmings of all kinds. This might have been a sensible thing to build after the mine had reached a tonnage of about a thousand tons a day, the mine extensively developed, and the market assured, but it stands today a monument to extravagant expenditures and inefficient planning.

To the north of the creek, there are about 15 shacks and other buildings that were intended to be used in connection with the old operations. These buildings would have served until the mine had been opened and the future of the property assured."

By 1934, the headframe and tipple of the mine were "so decayed as to be useless" (Thomson, 1934, page 4). When the mine was reopened by Suquash Collieries Limited in 1952, a new, smaller, headframe and hoist were installed at the shaft. The District Inspector of Mines, Tony James, described the operations as follows (James, 1953, pages A 309 and A 310):

"The present company started operations on March 6th, 1952, at the old shaft, which had been found with some difficulty owing to a very thick overgrowth of bush. The ground was cleared for several hundred feet around the shaft, and a tent camp established. A 16-foot headframe and a hoist were installed at the shaft collar. The unwatering of the shaft was then commenced, using a Knowles duplex piston pump of 50-gallons-per-minutes capacity. Power was supplied using a portable compressor, but this was replaced in July by a 5- by 10-foot vertical steam boiler. By June 6th the shaft and rise workings were pumped out and a start was made on reopening this portion of the mine. During the next few months 800 feet of old levels were reopened on the south side of the mine to provide access to the old longwall face. Samples of the coal were taken and operations creased on November 15th, pending a report by the company's consulting engineers."

After describing the fittings of the shaft, James mentioned the arrangements for ventilation (*op. cit.*, page A 310):

"The underground workings were ventilated by a 3-foot-diameter Sirocco exhausting fan. After the workings had been drained of water, a considerable amount of methane was given off; this necessitated careful provision of ventilation as the reopening of the workings progressed."

On conditions underground, James noted (*op. cit.*, page A 310):

"The old workings have stood very well because of the very hard sandstone roof above the seam. The writer was not able to examine the seam section on the old longwall face, but a section examined on the side of the south level 360 feet from the shaft showed a total thickness of 7 feet 6 inches. This included seven rock bands totalling 3 feet 1 inch. The thickest continuous section of clean coal was only 1 foot 5 inches. The seam section is believed, however, to improve on the longwall face and toward the south."

Work at Suquash Colliery ceased on November 15th, 1952 (James, 1954), and the mine is not known to have been reopened since.

6.2.5.3 Coal production statistics

Total production from the HBC mine, working the Suquash No.1 coal bed, was reported by James (1953) as approximately 10,000 tons (probably short tons).

Total production from Suquash Colliery, working the conjoint Suquash No.2/2R coal bed, was reported by Evans (1925) to be 14,749 tons (probably also short tons, but not explicitly stated).

Assuming that all of the coal was reported in short tons, the overall coal production at Suquash, in metric terms, was approximately 22,450 tonnes.

7 GEOLOGICAL SETTING

Geology of the Suquash area is known mainly from boreholes, since bedrock is largely concealed by a blanket of unconsolidated Quaternary deposits, collectively termed 'Drift', other than along a narrow strip of intertidal shelves and rock reefs along the coastline.

7.1 REGIONAL GEOLOGICAL CONTEXT

The Suquash coal property lies in the centre of the Suquash coalfield, which itself lies along the south-western margin of the Suquash basin, which is inferred to extend offshore beneath Queen Charlotte Strait and some the nearby islands (Gardner, 1984). The Suquash coalfield is hosted by sedimentary rocks of the Suquash Formation (shown on following page as **Table 2**), of Late Cretaceous (Campanian to possibly Maastrichtian) age.

7.2 LOCAL GEOLOGY

Interpreted bedrock geology of the Suquash area is presented as **Figure 7**. Four major stratigraphic assemblages are present in the Suquash area. From base upwards, they are basement rocks (consisting of the Vancouver and Bonanza groups), older Cretaceous sedimentary rocks, Upper Cretaceous coal-measures (Suquash Formation), Tertiary volcanic and associated intrusive rocks (Alert Bay Volcanics) and unconsolidated Drift.

7.2.1 BASEMENT

Economic basement beneath the Suquash coalfield is formed by older, slightly-metamorphosed basaltic to rhyolitic volcanic and volcaniclastic rocks, muddy carbonate rocks and clastic sedimentary rocks of Vancouver and Bonanza groups of Upper Triassic to Middle Jurassic age (Nixon and others, 2000). Only three boreholes within the entire coalfield, and none at all within Priority Ventures' Suquash coal licences, have reached the basement rocks. This general lack of basement penetration is a marked contrast to the situation in the company's Dove Creek property, where boreholes have routinely been taken to basement rocks.

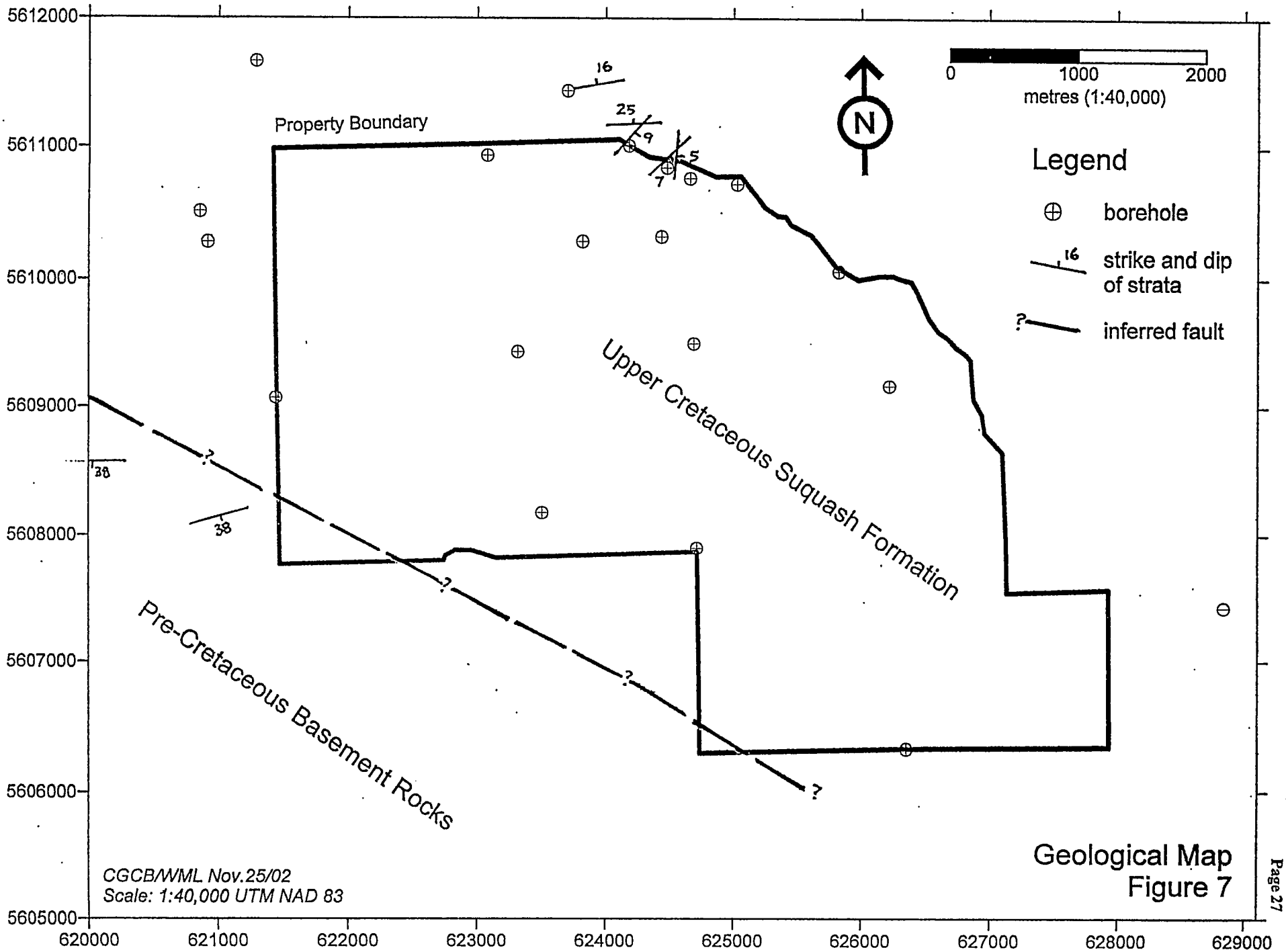
Basement rocks outcrop on the southwest side of the Keogh River valley, where quarries have been opened by Western Forest Products Ltd., who use limestone and volcanic rock from the quarries to surface their logging-roads throughout much of the Suquash area. For that reason, float and debris of limestone and volcanic rocks, frequently found downslope of washed-out logging roads, and do not necessarily indicate the presence of near-surface basement rocks in their vicinity.

Given the very sparse distribution of drill control on basement elevation beneath the coalfield, no meaningful statements can be made concerning the effect of basement paleotopography on the subsequent development of coal deposits at Suquash.

7.2.2 OLDER SEDIMENTARY ROCKS

Older coal-measures, as well as non-coal-bearing sedimentary rocks, are known at outcrop from the Quatsino coalfield, west of Suquash. These rocks comprise Coal Harbour Group of Lower Cretaceous age, and the Upper Shale Unit of early Upper Cretaceous age (Nixon and others, 2000).

The older sedimentary rocks are not known to outcrop along the immediate southwestern margin of the Suquash coalfield; the lack of outcrop is perhaps due to a northwest-striking fault (with substantial downthrow to the northeast) which is inferred to juxtapose basement rocks and the Suquash Formation.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Property Boundary
16
25
9
5
7
38
39
?
?
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N
0
1000
2000
metres (1:40,000)
Legend
borehole
16
strike and dip of strata
?
inferred fault
Upper Cretaceous Suquash Formation
Pre-Cretaceous Basement Rocks
CGCB/WML Nov.25/02
Scale: 1:40,000 UTM NAD 83
Geological Map
Figure 7

In the subsurface of the Suquash coal property, however, the older sedimentary rocks are believed to have been reached in two comparatively deep boreholes: SQ-1 in the northeastern corner of the property, and SU-80-1 in the east-central part of the property.

Table 2: Resource stratigraphy of Suquash coal property

Age (Epoch or Stage)	Unit (Formation or Member)	Graphic	Typical lithology and thickness range	Gas source potential
Quaternary	*Drift (undivided)*		Compact gritty sand over gravelly clay and silt over bouldery till. Thickness up to 110 m.	
Neogene (or older?)	*Alert Bay Volcanics and correlative dikes*		Flows and dikes of basalt and rhyolite; presence within Suquash property unknown.	Speculative source of heat for local devolatilisation of coals.
Upper Cretaceous Mid-Campanian to ?Maastrichtian	*Suquash Formation:* Upper Division		Light grey arkosic arenite and wacke, dark grey silty mudstone and siltstone with occasional thin coals (Suquash A and B coal beds). Thickness > 80 m (top not yet found).	
	Middle Division.		Light grey to greenish-grey arkosic to lithic wacke with minor conglomerate, dark grey siltstone and silty to carbonaceous mudstone; occasional thin coals (Suquash No.0, 1 and 1A coal beds). Thickness 50 to 70 m.	
	Lower Division		Light grey to greenish-grey arkosic to lithic wacke with minor conglomerate and gritstone, dark grey siltstone and silty to carbonaceous or coaly (locally bituminous?) mudstone; frequent coals (Suquash No.2R, 2, 2A, 2B, 3, 4 and 5 coal beds). Thickness 130 to 150 m. *Major exploration targets are Suquash No.2 coal bed at top of this unit, and No.5 coal bed near base of this unit.* (Possible unconformity at base)	Coals and organic-rich shales are possible source rocks for gas.
Cenomanian to ?Turonian	Upper Shale Unit		Dark grey siltstone, mudstone and minor lithic wacke. Thickness 35 to 80 m.	Shales may be source rocks for gas, if sufficiently organic-rich.
?Albian	Coal Harbour Group		Dark green or grey lithic wacke with minor interbeds of siltstone and mudstone; occasional coal beds. Thickness at least 90 m; base not yet found by drilling.	Coals and mudstones may be source rocks for gas if present in sufficient quantity.
Jurassic and older	*Bonanza Group and Vancouver Group*		Slightly metamorphosed volcanic, volcaniclastic and carbonate rocks. Thickness at least several kilometres.	Economic basement.

7.2.3 COAL-MEASURES

To date, only the Suquash Formation is known to contain significant coal within the Suquash coal property. The formation is of Late Cretaceous (Campanian to ?Maastrichtian) age, and is coeval with the Nanaimo Group as found further south on Vancouver Island. No information is yet available to adequately assess whether the Suquash Formation was formed within a basin which was coextensive with the Nanaimo Group basins, or whether the Suquash area was isolated from the southern basins by an emergent basement ridge during the Late Cretaceous.

The Suquash Formation outcrops sporadically as low headlands along the coastline of Queen Charlotte Strait, and more extensively as intertidal platforms and rock reefs below the high tide level. Exposures are not sufficiently complete to allow for measurement of a stratigraphic section along the coastline, so knowledge of the internal lithologic and stratigraphic relationships of the formation comes mostly from the boreholes which have been drilled within the Suquash coalfield.

Internal correlations of coal beds within the Suquash Formation are based mainly on their position relatively to more- or less-shaly zones within the formation, partially supplemented by comparison of geophysical log characters of the coals as seen in those few boreholes which have such logs.

7.2.4 POST COAL-MEASURES VOLCANIC AND INTRUSIVE ROCKS

East of the mouth of Cluxewe River (east of the Suquash coal licences), at least one basalt dike has been reported to cut through Cretaceous sedimentary rocks (Gardner, 1984); flow domes of basalt and basaltic breccia are also reported from the Twin peaks area, southeast of the property (Nixon and others, 2000) and Port McNeill harbour (Dawson, 1887).

Evans (1925) reported "an intrusion of some type of volcanic rock" near the south end of the old Suquash property; he may have been mentioning the dike east of Cluxewe River. Alternatively, he may have observed another dike closer to the present property. On the other hand, Daniels (1919b) reported that no flows of igneous rock were observed "in the immediate vicinity of Suquash".

7.2.5 DRIFT COVER

Throughout the Suquash coalfield, the ground surface is mostly covered by a variably-thick Drift mantle of glacial, glaciomarine and marine sediments, including extensive sandy terraces which are probably remainders of post-glacial raised beaches formed when the sea stood at higher levels than the present shoreline. Bedrock exposures are therefore confined to some of the deeper stream channels such as the lower Keogh River, and to the present-day foreshore.

The most complete exposures of Drift are in road-cuts along Rupert Main logging-road, within the south-central part of the Suquash coal licences. Information on the thickness of the Drift cover is provided by the boreholes which have been drilled at and near Suquash. Drift cover is locally greater than 80 metres thick, but is more typically 10 to 20 metres thick.

Table 3: Stratigraphic Data Summary for the Suquash Property and Adjoining Areas

Borehole	Approximate elevation of collar (m)	Thickness of Drift (m)	Suquash Formation			Older rocks		Total depth (m)
			Depth to top of Upper Division (m)	Depth to top of Middle Division (m)	Depth to top of Lower Division (m)	Depth to top of older sediments (m)	Depth to top of basement (m)	
HBC-3	59	1.52			---------- not reached ----------			
SQ-1	10	3.96		starts	45.11	196.6	not reached	366.98
SQ-2	5	1.52	starts	12.8?	77.42	----- not reached -----		122.22
SQ-3	15	1.52	starts	31.09	97.23	----- not reached -----		111.56
SQ-4	21	1.83	starts	6.71	---------- not reached ----------			59.13
SQ-5	30	1.83	starts	18.29	77.72	----- not reached -----		91.44
SQ-6	33	3.35	starts	25.3	84.73	----- not reached -----		95.1
S-74-1	45	3.35	starts	47.55	104.55	----- not reached -----		194.46
S-74-3	55	4.88	starts	9.14	75.29	----- not reached -----		200.56
S-74-4	38	33.53	starts	42.06?	110.95	259.99	not reached	295.05
S-74-5	63	2.74	starts	5.18	84.12	231.65	not reached	237.13
S-74-6	55	7.01	starts	34.90	105.77	----- not reached -----		221.89
S-74-10	93	23.77	starts	51.21	110.03	----- not reached -----		182.27
S-74-12	83	35.66	starts	76.20	---------- not reached ----------			163.98
S-74-13	120.5	45.11	starts	122.22	---------- not reached ----------			178.00
SU-80-1	32	3.35	starts	90.35	162.7	331.95	not reached	384.05
SU-80-2	97	>48.16	---------- this borehole did not reach bedrock ----------					48.16
SU-80-3	61	41.5		starts	76.4	----- not reached -----		207.57
SU-80-5	38	71.6	starts		142.35	311.4	not reached	365.76
Z-1	---------- no data ----------							

7.3 PROPERTY GEOLOGY OF THE SUQUASH COAL LICENSES

Within the Suquash coal licenses, the upper three divisions of the Suquash Formation either outcrop, or subcrop below Drift cover. These rock-units can be recognised with good confidence in downhole geophysical logs, and with lesser (but still fair) confidence, in older core descriptions.

Table 3 (preceding) presents formation and sub-unit tops, interpreted from borehole records within the Suquash area.

Bedrock beneath virtually all of the Suquash property is inferred to consist of sandstone (with minor conglomerate, gritstone, siltstone, mudstone and coal) of the Suquash Formation, with the exception of the extreme southwestern corner of the property, which is inferred to be underlain by pre-Cretaceous basement.

7.3.1 STRUCTURAL GEOLOGY

Owing to the scarcity of bedrock outcrops, the geological structure of the Suquash property is not well known. Borehole intersections suggest that the Suquash coal-measures are folded, perhaps into a series of west-trending anticlines and synclines, with limb dips of 10 degrees or less.

Several minor faults (apparently clean, simple normal extensional faults) were reported from the mine-workings of Suquash Colliery by Daniels (1919b), and minor faults may be reasonably expected to be present throughout the property.

A much larger, regionally-extensive fault was suspected by Dawson (1887) to be present along the base of the Vancouver Island foothills, crossing the southwestern margin of the Suquash coal licences; this fault is shown on recent geological maps (for example, Nixon and others, 2000), but to the author's knowledge this fault is not actually exposed anywhere within the coalfield.

Geological mapping of the Suquash coal property is not yet complete to the author's satisfaction, and the structural picture of the property may change following acquisition of further outcrop data. This further mapping is strongly recommended as a basic step in exploration of the Suquash coal licences.

7.3.2 DETAILS OF THE SUQUASH FORMATION

The Suquash Formation comprises (from base upwards) the informally-designated Lower Division, Middle Division and Upper Division. No attempt at definition of formal members within the formation has yet been made, although Jeletzky (1969, 1970) believed that some distinctive rock-units were present in the northern half of the coalfield.

7.3.2.1 Lower Division

The Lower Division of the Suquash Formation comprises the beds between the base of the formation and the top of the fine-grained mudstones and siltstones associated with the Suquash No.2 coal bed. As such, it includes the No.5, 4, 3, 2B, 2A, 2 and 2R coal beds.

Light grey to greenish-grey, arkosic to lithic wacke ('dirty' sandstone) forms the bulk of this rock-unit, but thick zones of dark grey siltstone and silty to carbonaceous or coaly mudstone are occasionally present, especially near the top and base of the division; lenses of conglomerate and gritstone are also locally present, and the Lower Division may include some beds of bituminous shale.

The top of the Lower Division can be easily traced on geophysical logs (and fairly easily traced in core logs), as it is marked by an abrupt contact of its uppermost fine-grained rocks with the base of the overlying sandstone.

The Lower Division of the Suquash Formation is 130 to 150 metres thick. Thus far, the Lower Division has not been observed at outcrop within the Suquash property, but it is inferred to extensively subcrop below Drift within the southwestern part of the property.

7.3.2.2 Middle Division

The Middle Division of the Suquash Formation comprises the beds between the top of the Lower Division and the top of the fine-grained mudstones and siltstones associated with the Suquash No.0 coal bed. As such, it includes the No.1A, 1 and 0 coal beds.

Light grey to greenish-grey arkosic to lithic wacke and lesser amounts of conglomerate form the bulk of this rock-unit, but thick zones of silty to carbonaceous mudstone and dark grey siltstone are locally associated with the No.1 coal bed.

The top of the Middle Division can be readily traced on geophysical logs and within core descriptions, as it is marked by an abrupt and pronounced upward decrease in gamma-ray counts, and an upward increase in clastic grain-size, owing to the transition from shale and coal up to sandstone and conglomerate.

The Middle Division of the Suquash Formation is 50 to 70 metres thick. Rocks of the upper part of the Middle Division are exposed along a wave-cut shelf between the high-tide and low-tide levels east of the mouth of Suquash Creek, in the northeastern corner of the Suquash coal licences.

7.3.2.3 Upper Division

The Upper Division of the Suquash Formation comprises the dominantly coarse-grained beds overlying the Suquash No.0 coal bed and its laterally-equivalent carbonaceous zone. As such, it includes the Suquash A and B coal beds.

Light grey arkosic arenite ('clean' sandstone) and wacke form the bulk of this rock-unit, but interbeds of dark grey silty mudstone and siltstone are also occasionally present. The basal sandstone of the Upper Division is clean and thick-bedded to massive, but higher sandstones appear by their geophysical log response to be at least locally silty or shaly.

The top of the Upper Division has not yet been found at Suquash, and this rock-unit is erosionally overlain by Drift throughout its known extent.

The Upper Division of the Suquash Formation is at least 80 metres thick. Its basal sandstones are well-exposed along a prominent shoreline bluff east of Suquash Colliery.

8 DEPOSIT TYPES

Exploration during the past 150 years at Suquash has been devoted to searching for mineable resources of bituminous coal.

8.1 COAL DEPOSIT MODEL

In contrast to the extensively-studied coal deposits of central Vancouver Island, no detailed deposit model has yet been proposed for the Suquash coals.

Notwithstanding this, coal deposits (for which exploration has been conducted in the Suquash area) are thought by the present author to have formed through coalification of coastal-plain to middle-deltaic peat deposits, which were deposited in sheltered environments between major northwest-flowing stream channels.

The extent of marine influence on the Suquash coal deposits is as yet unknown.

9 TARGET COAL ZONES

Coals are present within all three divisions of the Suquash Formation at Suquash (as shown in **Table 4**, below), but the primary exploration targets are the moderately thick coals of the Lower Division of the formation: the No.2 coal bed near the division's top, and the No.5 coal bed near the division's base. **Table 5** (following) presents details of the major coals at Suquash.

Continuity of the Suquash coals across the property appears to be fair to good: the coals can be readily correlated on downhole geophysical logs from Filtrol's 1980 boreholes, and they can be fairly well recognised in core descriptions from older boreholes (see **Chart 1**).

9.1 COAL BED NOMENCLATURE

The Suquash coal beds are designated by letters and numbers, commencing from A and B in the Upper Division of the formation, and then proceeding downwards from No.0 through to No.5 near the base of the Lower Division of the formation. The basic nomenclatural scheme was established by Saunders (1975a) and has been extended by the present author, in recognition that younger coals are now known to overlie those which were found by Saunders.

Table 4: Coal bed nomenclatural scheme

Upper Division of Suquash Fm.	B coal bed	
	A coal bed	
Middle Division of Suquash Fm.	No.0 coal bed	
	No.1 coal bed / "Hudson's Bay Seam"	former opencast mine
	No.1A coal bed	
Lower Division of Suquash Fm.	No.2R coal bed [locally joins No.2]	
	No.2 coal bed / "Suquash Seam"	major exploration target / former underground mine
	No.2A coal bed	
	No.2B coal bed	
	No.3 coal bed / "Lower Seam"	
	No.4 coal bed	
	No.5 coal bed	major exploration target

Table 5: Coal bed data summary for the Suquash property

		SUQUASH NO.2 COAL BED			SUQUASH NO.5 COAL BED		
Borehole	Elevation (m)	roof (m)	net (m)	gross (m)	roof (m)	net (m)	gross (m)
HBC-3	59	*- - - - not reached - - - -*			*- - - - not reached - - - -*		
SQ-1	10	49.38	1.45	1.75	167.94	0.61	0.61
SQ-2	5	81.08	0.91	0.91	*- - - - not reached - - - -*		
SQ-3	15	99.36	0.91	1.82	*- - - - not reached - - - -*		
SQ-4	21	*- - - - not reached - - - -*			*- - - - not reached - - - -*		
SQ-5	30	81.69	1.17	1.83	*- - - - not reached - - - -*		
SQ-6	33	86.62	0.32	0.71	*- - - - not reached - - - -*		
S-74-1	45	104.55	0	0.30	*- - - - not reached - - - -*		
S-74-3	55	79.86	0.18	1.22	186.08	0	2.59
S-74-4	38	110.95	0.15	0.76	219.46	0.23	0.46
S-74-5	63	84.12	0	0.20	194.16	0.24	2.44
S-74-6	55	105.83	0.61	1.80	215.49	0.91	0.91
S-74-10	73	110.55	0	0.85	*- - - - not reached - - - -*		
S-74-12	83	*- - - - not reached - - - -*			*- - - - not reached - - - -*		
S-74-13	120.5	*- - - - not reached - - - -*			*- - - - not reached - - - -*		
SU-80-1	32	162.6	0.75	0.90	293.88	2.42	3.45
SU-80-2	97	*- - - - not reached - - - -*			*- - - - not reached - - - -*		
SU-80-3	61	79.45	0.55	0.55	196.45	0.95	1.45
SU-80-5	38	*- - - - not present - - - -*			295.7	0.9	2.0
Z-1	45	*- - - - no data - - - -*			*- - - - - no data - - - - -*		

9.2 COAL BED MAPPING

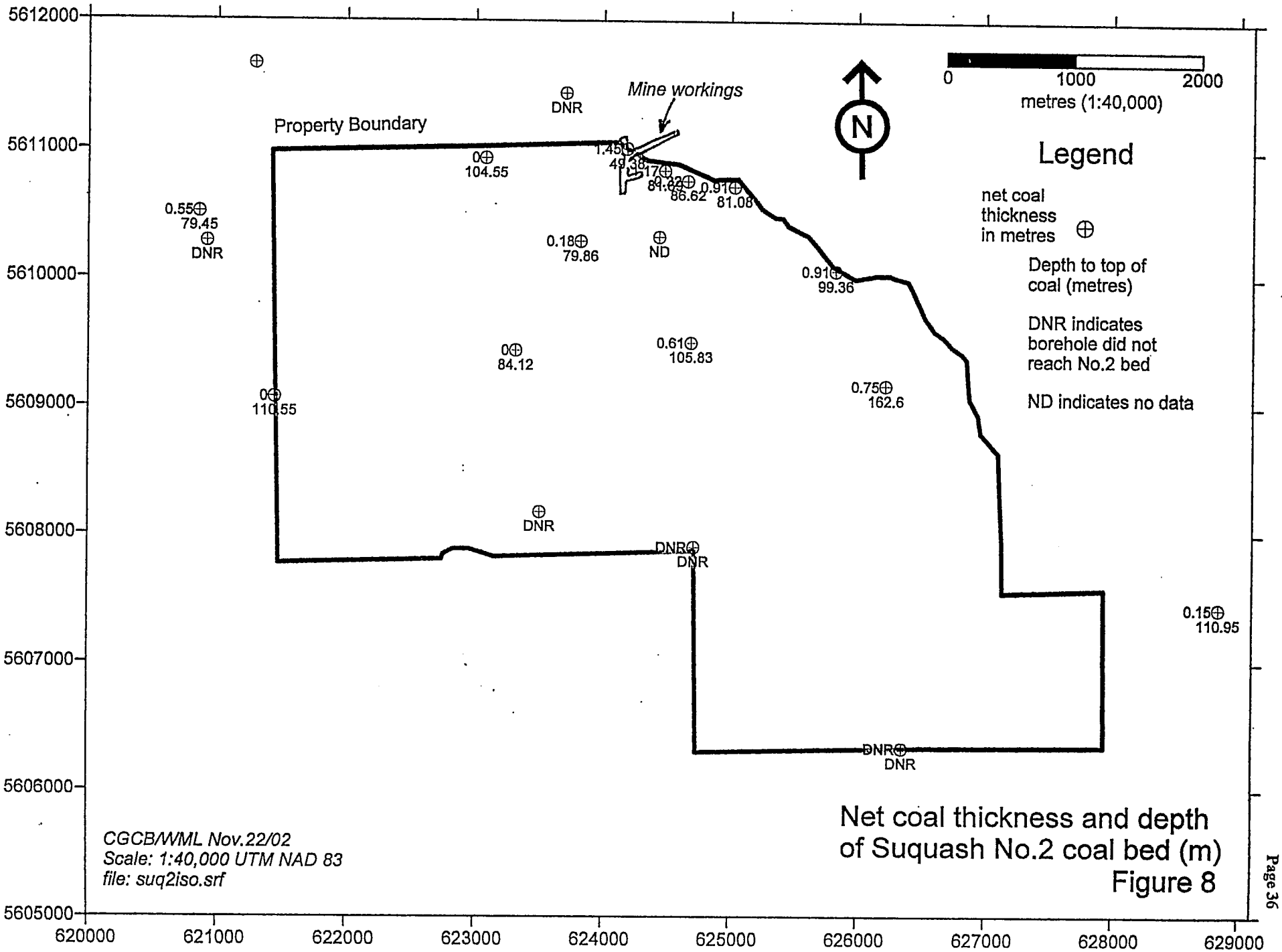
In the course of the present study, maps have been created to summarise the thickness and distribution of the Suquash No.2 and No.5 coal beds, as shown by existing boreholes within and adjacent to the Suquash coal property.

9.2.1 SUQUASH NO.2 COAL BED

Figure 8 (following) shows the net coal thickness and depth below surface of the Suquash No.2 coal bed, as outlined by existing boreholes within and adjacent to Priority Ventures' coal licences. This map also shows the position of the old workings of Suquash Colliery, which mined the No.2 coal bed (and locally also mined the closely-conjoint No.2 Rider coal) in the northeastern corner of the property.

Only one borehole (SQ-1) shows a net coal thickness of possible interest. The mine's workings encountered thin and split coal to the north of the present property, and found somewhat cleaner coal as they progressed southward. **Chart 2** shows the sections of the No.2 and No.2 Rider coals which were found along the southwestern, updip, side of the mine.

The prospect for mineable coal in the No.2 bed appears to be fairly closely limited by poor drill results to the west and southeast of the mine.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Property Boundary
Mine workings
DNR
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metres (1:40,000)
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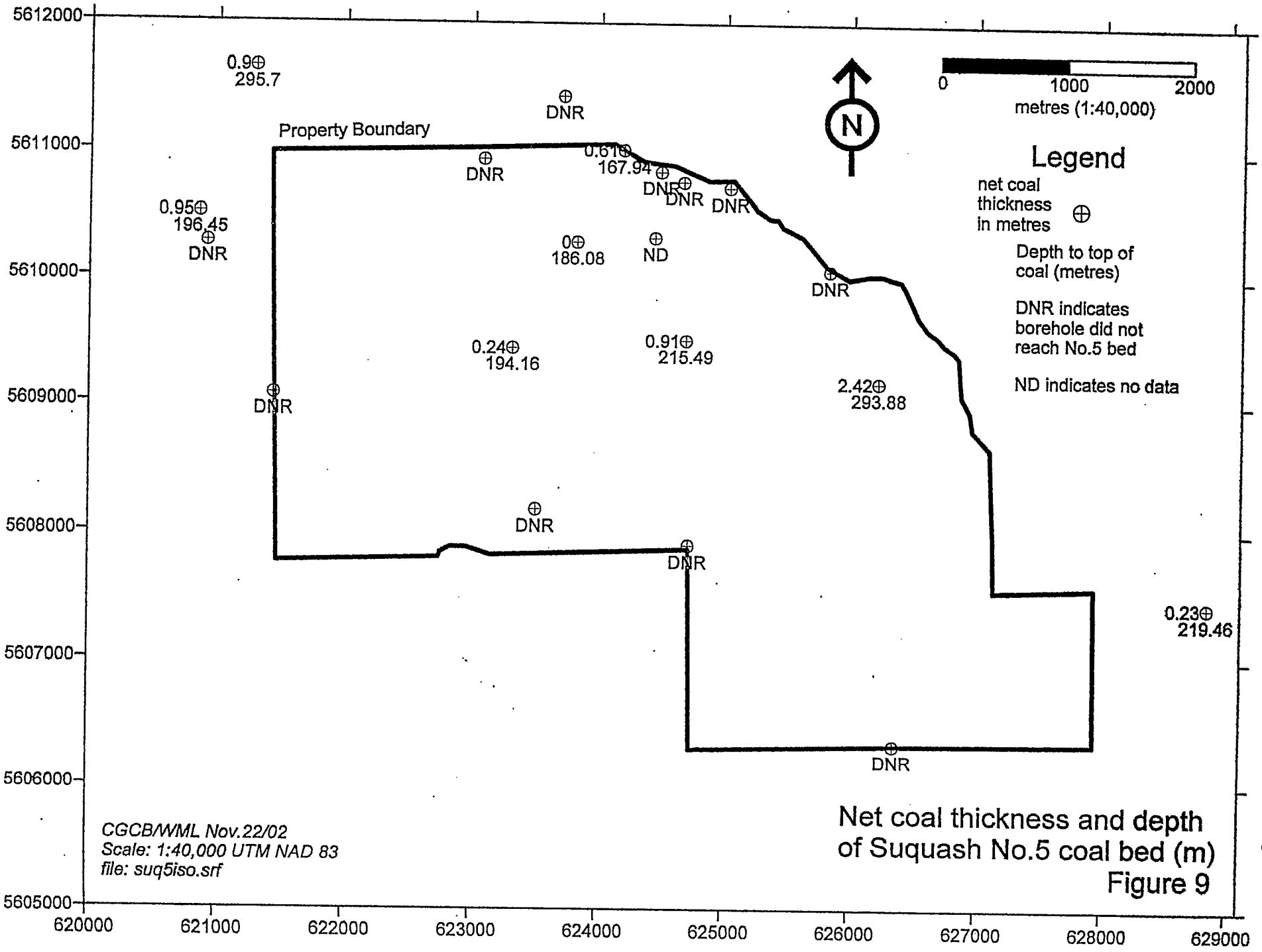
Legend
net coal thickness in metres
Depth to top of coal (metres)
DNR indicates borehole did not reach No.2 bed
ND indicates no data
0.55 79.45
0 104.55
1.45 49.38
17 84.62
9.32 86.62
0.91 81.08
0.18 79.86
ND
0.91 99.36
0 84.12
0.61 105.83
0 110.55
0.75 162.6
0.15 110.95
CGCB/WML Nov.22/02
Scale: 1:40,000 UTM NAD 83
file: suq2iso.srf
Net coal thickness and depth of Suquash No.2 coal bed (m)
Figure 8

9.2.2 SUQUASH NO.5 COAL BED

Figure 9 (following) shows the net coal thickness and depth below surface of the Suquash No.5 coal bed, as outlined by existing boreholes.

Only one borehole (SU-80-1) shows a net coal thickness of possible interest. The section found in this borehole is shown as **Figure 10** (following). The focused-beam log trace (at the left side of the section) shows that the No.5 coal contains numerous bands of rock and poor-quality coal. Nonetheless, this appears to be the best coal section found to date by drilling at Suquash, although it does appear to be dirtier than the stratigraphically-higher No.2 coal which was found in the old Suquash mine.

The prospect for mineable coal in the No.5 bed is somewhat limited by limited by poor drill results to the west and northwest of borehole SU-80-1, but it is open to potential southward extension.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DNR
Property Boundary
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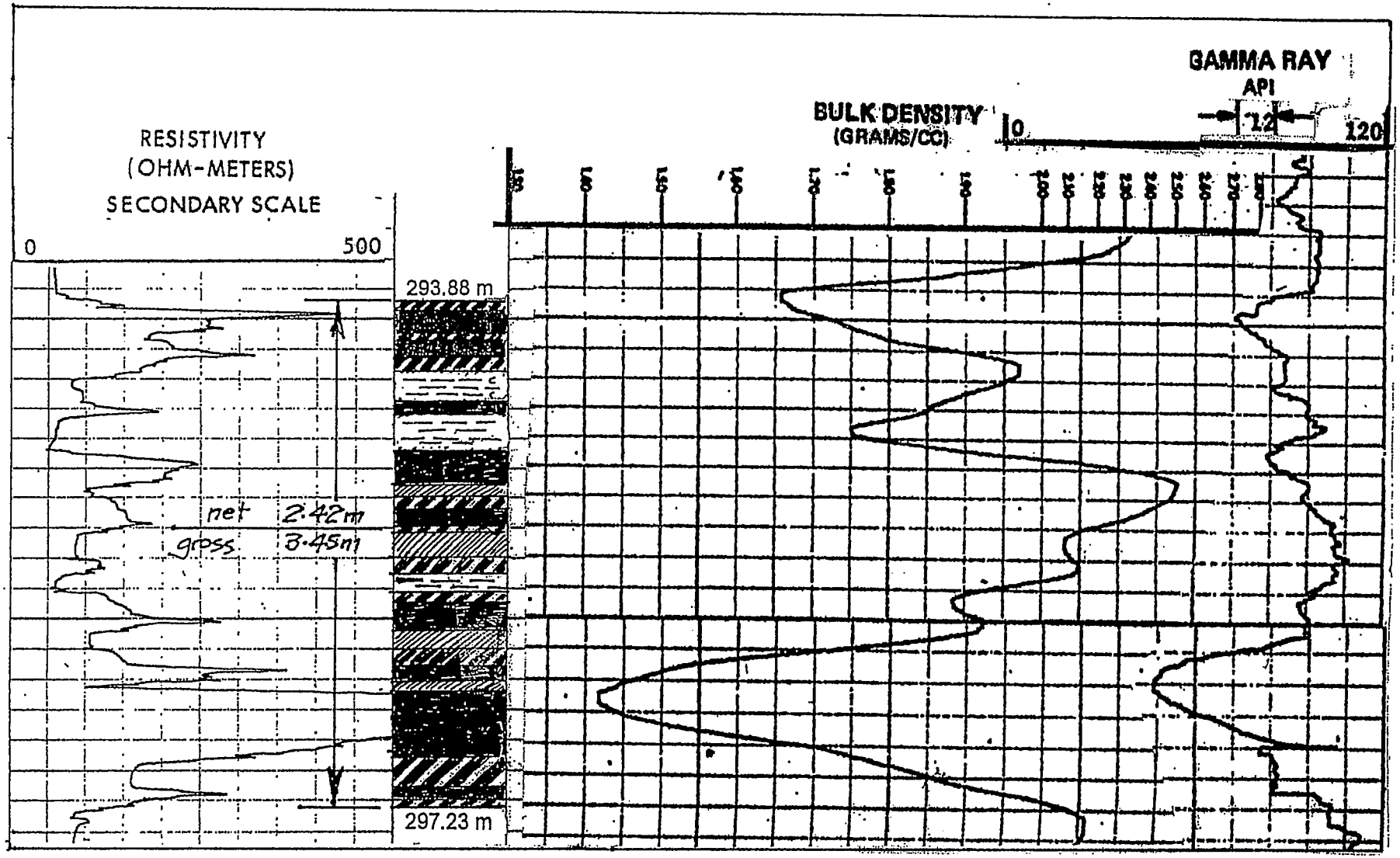
DNR
DNR
DNR
0.95⊕ 196.45
DNR
0⊕ 186.08
ND
DNR
0.24⊕ 194.16
0.91⊕ 215.49
DNR
2.42⊕ 293.88
DNR
DNR
DNR
0.23⊕ 219.46
N
0
1000
2000
metres (1:40,000)
Legend
net coal thickness in metres ⊕
Depth to top of coal (metres)
DNR indicates borehole did not reach No.5 bed
ND indicates no data
CGCB/WML Nov.22/02
Scale: 1:40,000 UTM NAD 83
file: suq5iso.srf
Net coal thickness and depth of Suquash No.5 coal bed (m)
Figure 9



Symbolic legend

coal

dirty coal

coaly mudstone

carbonaceous mudstone

mudstone

PRIORITY VENTURES LTD.

Suquash Coal Property

Interpreted section of Suquash No.5 coal bed in borehole SU-80-1

Base: Roke logs	Scale: 1:200 vertical
CGCB/WML Nov. 24/02	log scaling as shown
Westwater Mining Ltd.	**Figure 10**

10 PRIORITY VENTURES' AUTUMN 2002 GEOLOGICAL PROGRAMME

The November 2002 geological programme, which contributes a minor part of the data used in the present study, consisted of an extremely limited amount of geological mapping, followed by reinterpretation of available borehole geophysical records from historic boreholes within and near the property.

10.1 GEOLOGICAL MAPPING

Geological mapping during the autumn of 2002 programme was confined to cursory reconnaissance of geologic structure along logging-roads, and along the shoreline near the old Suquash Colliery. The object of the mapping was to scope-out the extent of outcrop along roads and the coastline. to determine whether useful sedimentological and structural information could be obtained.

Figure 7 presents our current interpretation of the bedrock geology of the Suquash coal property, drawing heavily on the geological map presented by Saunders (1975a) but also honouring the author's present understanding of the local stratigraphy.

10.2 DOWNHOLE GEOPHYSICAL LOG INTERPRETATION

A basic suite of downhole geophysical logs, comprising gamma ray/density/caliper and focussed beam tool at one or both of 5- and 20-cm spacing, were run in the Filtrol boreholes. During the course of the present study, the author viewed and interpreted these logs, using them to help erect a stratigraphic framework for the Suquash Formation within the Suquash coal licences.

Details of geophysical logs for each hole are presented below as **Table 6**.

Table 6: Downhole geophysical logs run within and adjacent to the Suquash property

BOREHOLE	LOG ACRONYM AND NAME	VERTICAL SCALE	DEPTH RANGE
SU-80-1	GDC: Gamma/density/caliper	1:200	0.0 to 382.5
"	FBL - 5: Focused beam log (5 cm)	1:200	28.0 to 382.0
"	FBL - 20: Focused beam log (20 cm)	1:200	28.2 to 380.0
SU-80-2	*no logs run*		
SU-80-3	GDC: Gamma/density/caliper	1:200	0.0 to 201.0
"	FBL - 5: Focused beam log (5 cm)	1:200	30.0 to 201.0
SU-80-5	GDC: Gamma/density/caliper	1:200	0.0 to 366.0
"	FBL - 20: Focused beam log (20 cm)	1:200	0.0 to 366.0

10.3 STATEMENT OF RESPONSIBILITY

Geological mapping and geophysical interpretation were done by the author, acting as an independent consulting geologist to Priority Ventures Ltd.

10.4 RELIABILITY OF RESULTS

Owing to the great scarcity of rock outcrops within the Suquash coal licences, surface geological mapping has not been particularly informative, except insofar as it has allowed recognition of potentially-useful paleoichnological features of the Upper and Middle divisions of the Suquash Formation.

The author is not a geophysicist, and is well aware of the limitations faced by any geologist who attempts to interpret borehole geophysical records. Alternative structural and stratigraphic interpretations of geophysical data are certainly possible.

Downhole geophysical logging of the Filtrol boreholes was not witnessed by the author, and she disclaims responsibility for their accuracy, inasmuch as she did not participate in the selection of logging-programme settings.

Results of the historic drilling programmes at Suquash (as discussed below) are regarded by the author as being useful, subject to the usual caveat that a borehole at any particular location does not absolutely constrain the geological interpretation of intervening undrilled areas. Given drilling to date, gross stratigraphy of the Suquash Formation seems to be reasonably well-defined and 'well-behaved'; structural geology of the Suquash coal licences, on the other hand, may still hold some surprises.

11 DRILLING

Positions of all boreholes at Suquash, as presented in the present report (whether within or outside Priority Ventures' present coal licences) are based on existing maps. The author has not attempted to relocate the boreholes on the ground, and anticipates that to do so will be difficult and time-consuming owing to the dense forest cover over much of the area (which will have very likely obliterated traces of pre-1980 work) and to the recent requirements for reclamation of coal-exploration borehole sites (which will probably have obliterated any traces of the road-based 1980 Filtrol drill programme).

Of the 27 historic boreholes known to have been drilled in the Suquash Basin, 15 are reported to have been drilled within or immediately on the outer boundaries of the coal licences presently held by Priority Ventures. Five more boreholes lie close by the property, and may be regarded as useful in working out the regional geology of the area.

Table 7: Location data for historic boreholes within and near the Suquash coal property

Borehole	Year drilled	Legal description of site	UTM 83 coordinates	Elevation (m)
HBC-3	1853	Section 33, Township 3, Rupert District	620920 E, 5610280 N	59
SQ-1	1907	Lot 15, Township 3, Rupert District	624185 E, 5611010 N	10
SQ-2	1907?	Lot 16, Township 3, Rupert District	625030 E, 5610715 N	5
SQ-3	1907?	Lot 16, Township 3, Rupert District	625830 E, 5610060 N	15
SQ-4	1908	Section 2, Township 5, Rupert District	623705 E, 5611435 N	21
SQ-5	1913	Lot 15, Township 3, Rupert District	624485 E, 5610840 N	30
SQ-6	1913	Lot 15, Township 3, Rupert District	624665 E, 5610760 N	33
S-74-1	1974	Lot 15, Township 3, Rupert District	623080 E, 5610935 N	45
S-74-3	1974	Lot 15, Township 3, Rupert District	623825 E, 5610285 N	55
S-74-4	1974	Section 20, 2 3, Rupert District	628835 E, 5607430 N	38
S-74-5	1974	Lot 15, Township 3, Rupert District	623320 E, 5609435 N	63
S-74-6	1974	Lot 16, Township 3, Rupert District	624695 E, 5609500 N	55
S-74-10	1974	Lot 14, Township 3, Rupert District	621445 E, 5607070 N	73
S-74-12	1974	Lot 12, Township 3, Rupert District	624720 E, 5607900 N	83
S-74-13	1974	Section 19, Township 2, Rupert District	626355 E, 5606330 N	120.5
SU-80-1	1980	Lot 12, Township 3, Rupert District	626225 E, 5609165 N	32
SU-80-2	1980	Lot 13, Township 3, Rupert District	623510 E, 5608175 N	97
SU-80-3	1980	Section 33, Township 3, Rupert District	620860 E, 5610510 N	61
SU-80-5	1980	Section 4, Township 5, Rupert District	621290 E, 5611660 N	38
Z-1	*unknown*	Lot 15, Township 3, Rupert District	624445 E, 5610320 N	45

Note: all boreholes are within grid cell XG of UTM grid zone 9U

The drilling methods used for HBC-3 and Z-1 are unknown. The SQ-series boreholes were bored with diamond-drills, operated either by the Diamond Drill Contracting Co. of Spokane, Washington, or by the coal company itself. The S-series boreholes were also bored with a diamond-drill, operated by D.W. Coates Enterprises Ltd. of Vancouver, B.C. The SU- series boreholes were drilled with air-rotary water-well rigs provided by Ken's Drilling Ltd. of Victoria, B.C.

11.1 BOREHOLE DESIGN

No information is available concerning borehole design of the historic boreholes at Suquash.

11.2 CORE-LOGGING METHODS

No information is available concerning core-logging methods used for the historic boreholes at Suquash.

11.3 SAMPLE LENGTHS AND ORIENTATION OF COAL BEDS

All of the Suquash boreholes were reportedly intended to be drilled in a vertical position. Dip tests were only run on B.C. Hydro's S-series boreholes, which had reported deviations from verticality ranging from 2° to 5°. Reported core bedding dips in Hydro's boreholes (Saunders, 1975a) range from nil to 12°, and were generally less than 5°. Minimal difference is therefore considered to have existed between the reported and true bed thicknesses and sample lengths in Hydro's boreholes. *As neither oriented core-barrels nor dipmeter tools were available for use, the detailed orientations (i.e. strike and dip) of the coal beds encountered by historic drilling at Suquash are as yet unknown.*

Because neither dip nor verticality information was available concerning boreholes drilled before or after 1974, apparent thickness of coal intersected by the boreholes was used for volumetric calculation of coal quantities, and the areas of all resource blocks were calculated on their horizontal plane projection.

12 SAMPLING METHOD AND APPROACH

Information reported here is drawn from reports here referenced. Speculations on the validity and potential sources of bias are the present author's opinions, but responsibility is hereby disclaimed for the samples themselves (and the reported circumstances of their collection and analysis) since the author has not had access to the drill cores nor the mine-workings, did not take the samples, and has therefore been obliged to rely upon on the reports here cited.

12.1 SAMPLES FROM BOREHOLES

Information on borehole sampling methods is only available for the B.C. Hydro S-series boreholes, drilled in 1974.No information has been found concerning earlier boreholes (SQ-, HBC- and Z- series), and the subsequent SU-series boreholes were not cored.

12.1.1 METHODOLOGY

The following statement of sampling methodology is taken from the assessment report concerning B.C. Hydro's S-series boreholes (Saunders, 1975a, page 13):

> *"A total of 68 samples were taken from eight of the ten drill holes and sent to Commercial Testing and Engineering Co. in Vancouver for proximate analyses. Sample lengths ranged from one to ten feet and averaged 2.8 feet. Samples were selected on the basis of coal content and lithology wherever possible, although often the lack of significant discrete coal seams in a zone resulted in a general "zone" sample being collected. Occasionally, short sections of waste (shale) within a zone were omitted from a sample (as might occur in a cleaning plant). A lithologic description, quantified where possible, was made for each sample."*

12.1.2 ISSUES CONCERNING ACCURACY AND RELIABILITY

Core loss may have occurred in all of the diamond-drill holes. Since the physical condition, volumetric recovery and linear recovery of cores have not been reported in detail, and the cored holes have not been geophysically logged, it is not possible to assess core loss via the standard coal-industry methods of reconciliation of cores with geophysical logs.

Some particles of drilling mud probably were inadvertently taken with the materials being sampled, despite best efforts to avoid this source of contamination. Conversely, fine coal fragments may have migrated out-of-place along and between rows in the core boxes; these out-of-place materials might not have been included within samples.

12.1.3 SAMPLE QUALITY ISSUES

Historic sample quality at Suquash is interpreted to have been mostly impacted by recovery and physical condition of drill cores, and to a lesser extent by post-drilling physical damage to the cores consequent on occasional rough handling of the cores by the drilling crew.

12.1.4 RECOVERY AND PHYSICAL CONDITION OF CORES

Only limited information is available on recovery and physical condition of historic drill cores at Suquash.

- Some details of shearing or broken ground in the cores were reported by Saunders (1975a), but recovery was not reported although the logging forms used in reporting the drill results had columns designated for such use.
- No recovery data are available for the older SQ-series boreholes.

12.1.5 SPECULATIONS CONCERNING SAMPLE BIAS

Samples from the 1974 S-series boreholes were probably deliberately and preferentially taken from coal beds and associated carbonaceous zones which appeared upon visual assessment to have some economic potential. This choice should not have introduced bias into the results of the 1974 programme, since the object of the exercise was to evaluate potentially-mineable coal beds.

Some bias may also have been introduced by the friability of thin bright coal bands, which might have tended to flake off the core and migrate to other parts of the core box being examined. These 'migrant' coal particles might have been excluded from samples by the person(s) doing the sampling. Some *inadvertent* bias may also have been introduced in those zones where core recovery was incomplete. Bright coal, or interlaminated and slicked coal and mudstone, or sheared coal, might have been more often washed away during coring.

The effect of these biases defies quantification, given data at hand, but such suspected sources of bias could perhaps be addressed by taking large-diameter cores in future programmes, or by using triple-tube core barrels.

12.1.6 GEOLOGICAL CONTROLS ON SAMPLING INTERVALS

Judging from the sampling records for the B.C. Hydro boreholes, samples were taken to cover major lithologic subdivisions of coal beds and coal zones, although as Saunders (1975b) noted, some rock partings were left unsampled.

Inasmuch as coal of potential interest for underground mining at Suquash generally occurs as discrete beds (or as intermixtures of coal and rock within a definable coal zone), the fundamental geological control on sampling interval would probably have been the recognisable boundaries between carbonaceous and non-carbonaceous rocks.

12.1.7 COMPOSITE SAMPLES

No composite samples are known to have been taken from Suquash borehole cores for sink-float testing.

12.1.8 DISCUSSION OF RESULTS

Saunders (1975a, page 17) summarised analytical results from B.C. Hydro's 1974 S-series boreholes:

> *"The ranges and averages for all proximate analyses of samples (not zones) are as follows ("as received" basis):*

Item	*High*	*Low*	*Range*	*Average*
Zone thickness - (ft.)	*21.0*	*1.0*	*20.0*	*4.7*
Aggregate clean coal - (ft.)	*7.1*	*0*	*7.1*	*0.6*
Sample length - (ft.)	*12.1*	*1.0*	*11.1*	*3.6*
Moisture - (%)	*9.25*	*3.67*	*5.58*	*6.15*
Ash - (%)	*74.59*	*8.26*	*66.33*	*47.92*
Volatile Matter - (%)	*41.17*	*13.57*	*27.60*	*22.64*
Fixed Carbon - (%)	*54.00*	*5.85*	*48.15*	*23.29*
Sulphur - (%)	*6.15*	*0.16*	*5.99*	*2.01*
Calorific Value - (Btu/lb)	*11,840*	*1,348*	*10,492*	*5,564*

> *A number of factors are apparent upon inspection of these figures. The amount and proportion of "clean" coal in the coal zones is small and this is reflected in the analytical results. The ash content, also because of the small proportion of clean coal, is very high even though samples of probably unmineable thickness (1-3 feet) with a higher-than-average coal content have been included in the average. Calorific value is correspondingly low. Sulphur content is high. Moisture content is not high, (6%)."*

These results suggest that the coals which were sampled are very dirty, and have moderate to high sulphur contents.

12.1.8.1 Coal rank

Calorific value of the coal is consistent with High Volatile "C" bituminous rank. However, vitrinite reflectance testwork done on cores from borehole S-74-5 by Candace Kenyon, formerly of the B.C. Geological Survey Branch (Kenyon. 1991) disclosed relatively high mean random reflectance values of 0.60% to 0.80%, averaging 0.75%. These values are consistent with High Volatile "B" to "A" bituminous rank.

This apparent discrepancy can perhaps be explained by considering that when Kenyon sampled the cores, the major coals had already been removed for earlier analysis. Kenyon's samples may therefore have come from thinner coal beds, which may have attained higher levels of organic maturation (as shown by higher reflectance, and thus apparently higher rank) owing to more effective communication with porous sedimentary rocks, in turn allowing more effective release of the volatiles which are cleaved off from coal during the coalification process.

12.1.8.2 Ash/specific gravity relationships

A limited number of samples from B.C. Hydro's borehole S-74-5 were analysed for specific gravity as well as ash content. Although the basis upon which the specific gravity was reported was not stated on the analytical certificates presented by Saunders (1975a), a cross-plot of these data (see **Chart 3**, following) has been constructed. This plot suggests that coal with 20% dry ash content would have a specific gravity of approximately 1.45 gm/cm^3.

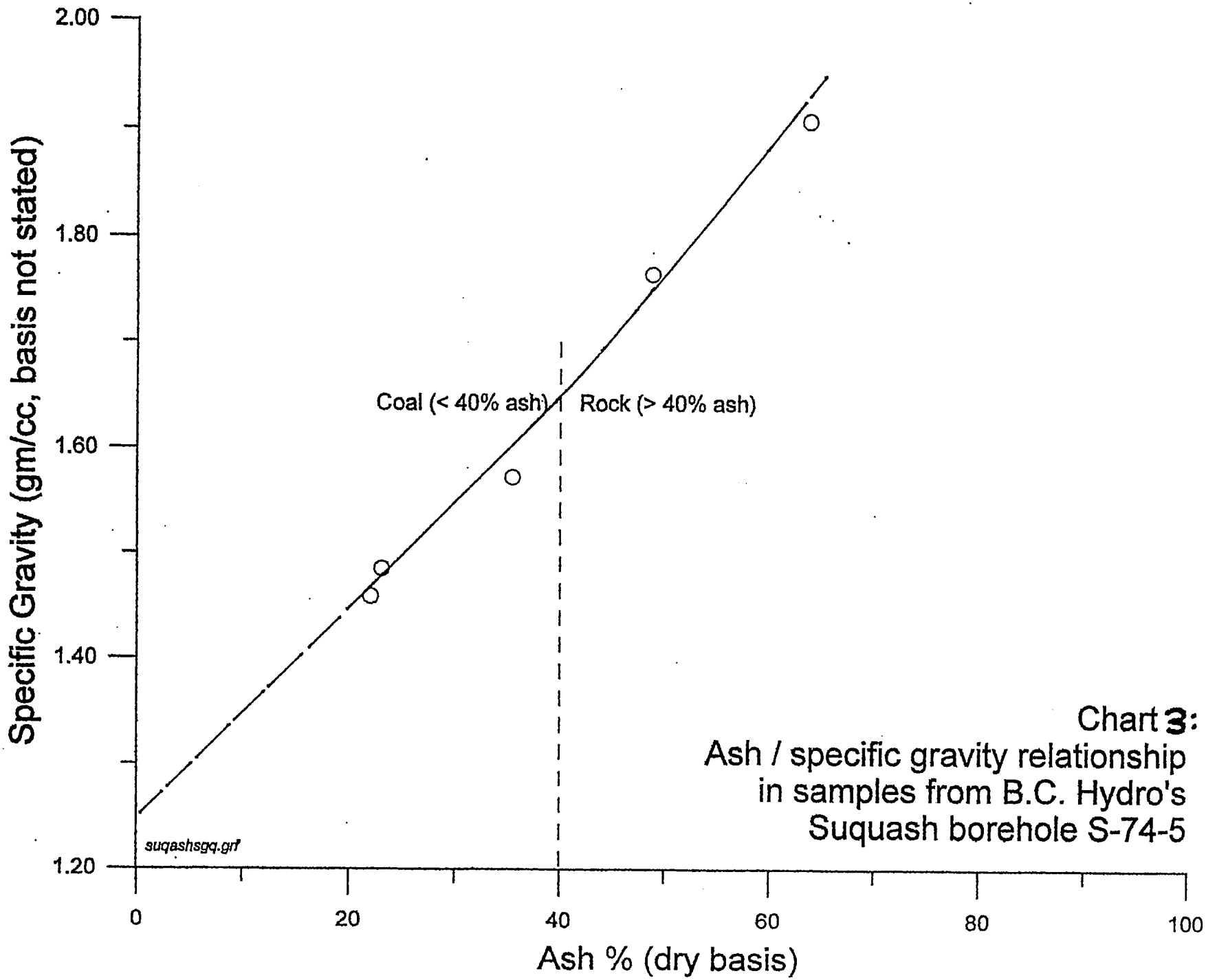


Chart 3:
Ash / specific gravity relationship
in samples from B.C. Hydro's
Suquash borehole S-74-5

12.2 SAMPLES FROM MINE WORKINGS

Samples have reportedly been taken from the mine workings of Suquash Colliery during the 1918 (Daniels, 1918b) and 1952 (Hope and Louttit, 1953) studies. Samples were taken from the No.2 coal bed, or from the conjoint No.2/2R coal bed.

12.2.1 METHODOLOGY

Daniels (1918b) took samples of coal (numbered from 1 through 7) from localities DD, DE, DG and DH (as shown on the geological plan of Suquash Colliery, presented as **Map 1** of the present report).

- Samples no.1, 2 and 6 were reportedly taken of the coal bed from roof to floor of the mine workings (at localities DD, DH and DG respectively), taking only the coal layers and rejecting all the bands of rock. Sample no.6 was picked-over to obtain clean coal.

- Sample no. 7 was reportedly taken from the roof to floor of the mine workings (on the longwall face at locality DE), rejecting two dirt bands but taking the upper coal and the entire bottom coal including its contained dirt bands. This sample was intended by him to represent the coal which would be obtained if only part of the rock was removed.

- Samples no.3, 4 and 5 were reportedly taken of individual coal layers at locality DH, again with all rock bands removed. These samples were intended by him to assess the quality of these coal layers.

Hope and Louttit (1953) took a grab sample of the coal at the foot of the mine's shaft, and also took a channel sample of coal only, probably from locality H3 (see **Map 1** of the present report).

12.2.2 ISSUES CONCERNING ACCURACY AND RELIABILITY

No details have been found to how effectively the rock bands were sorted-out from Daniels' samples. It might, however, be presumed that he took greater care in sampling than a coal miner would have taken in cleaning coal which had been blasted or cut from the working face during actual production operations. Therefore it is likely that Daniels' samples would have been somewhat cleaner than the coal which could have been produced by selective mining at those locations within the mine workings.

Similarly, Hope and Louttit (1953) did not report how they cleaned and collected their channel sample of the coal from the mine. Their grab sample is of limited utility since they did not report exactly where it came from within the coal bed, or what thickness it represented.

12.2.3 SAMPLE QUALITY ISSUES

Insufficient information is available to speculate on the quality of the samples which were taken from the mine workings, other than to reiterate that the grab sample reported by Hope and Louttit (1953) was unlikely to be representative of the coal bed being worked.

12.2.4 SPECULATIONS CONCERNING SAMPLE BIAS

As was the case with borehole cores, bias may have been present within the samples taken from the mine workings.

- Banded coals and soft, sheared coals are easier to cut and collect into a sample bag; massive and hard coals are, conversely, harder to cut and collect.
- Rejection of rock bands from the samples may well have been intended to simulate the quality of coal which could have been produced by hand-miners who were motivated to sort the coal from the rock at the coal face, but it introduces an obvious bias into the sample results, in the direction of lower ash content.
- Furthermore, a grab sample would almost certainly be biased in favour of a 'good-looking' lump of bright coal.

12.2.5 GEOLOGICAL CONTROLS ON SAMPLING INTERVALS

With the exception of the one reported grab sample, samples from within the mine-workings were taken to cover major lithologic subdivisions, or the entirety (subject to at-face selection and rejection of rock bands) of the section being mined.

As suggested by **Chart 2**, some of the sections may not have traversed the entire thickness of the conjoint No.2/2R coal zone, since it appears that as the major rock partings thickened within the mine, some of the coals may have been left unworked above the roof or below the floor of the mine. In these areas of effective splitting of the coal into separate beds, the thickening of rock partings would have controlled which coals could be accessed for sampling.

12.2.6 COMPOSITE SAMPLES

No composite samples are known to have been taken from Suquash Colliery for sink-float testing.

12.2.7 DISCUSSION OF RESULTS

Daniels (1918b, page 78) reported the following analytical results on an air-dried basis:

Sample	*Moisture at 105°C*	*Volatile Matter*	*Fixed Carbon*	*Ash*	*Sulphur*	*B.t.u.*
1. 60' down main slope at G. Entire seam	*5.79*	*36.02*	*37.93*	*20.26*	*1.75*	*10,060*
2. Longwall face at H. Entire seam	*6.71*	*36.80*	*40.46*	*16.03*	*0.96*	*10,680*
3. Longwall face at H. Top coal 8"	*6.05*	*40.95*	*43.34*	*9.66*	*0.80*	*11,400*
4. Longwall face at H. Middle coal 10"	*5.92*	*36.51*	*37.21*	*20.36*	*0.55*	*9,883*
5. Longwall face at H. Bottom bench, coal only	*5.41*	*37.84*	*38.27*	*18.48*	*0.95*	*10,505*
6. Longwall face at D. Entire seam	*5.55*	*37.85*	*38.90*	*17.70*	*0.92*	*10,683*
7. Longwall face at E. Entire seam	*5.92*	*35.18*	*35.27*	*23.83*	*1.85*	*9,380*

His discussion of the sample results and the physical appearance of the coal (*op. cit.*, pages 79-80) follows:

> *"The analyses indicate that the coal is moderately high in moisture with a content ranging from 5.41 to 6.71 percent; the volatile matter is rather high, averaging between 36.0 and 36.50 percent; ash is normally high, in the full seam sections varying from16.03 to 23.83 percent; sulphur is also high. The percentage of fixed carbon approximates that of the volatile matter and is moderately low. The heat values are low, averaging 10,200 British thermal units for the full seam sections. The samples do not coke, but all cake slightly.*
>
> *The special samples such as numbers 3, 4 and 5 indicate that the individual benches of the seam are variable in character and that the top band of coal is the cleanest and best. Samples 6 and 7 show the relative difference between a cleaned and an uncleaned mine sample, the ash in the picked sample being 17.70 percent as contrasted with 23.83 percent with corresponding heat values of 10,683 and 9,380 British thermal units.*
>
> *In physical appearance, the coal is fairly bright and lustrous, especially the upper benches, but the bony coal is dull. The fracture is conchoidal, but there is some indication of cleat or parting joints at right angles to the planes of bedding. These joints contain thin white plates, which may be either lime carbonate or sulphate, and flakes of iron pyrites. The high sulphur content of the coal is due in part to this material. The powder of the coal is brownish black and the streak is brown. The coal does not appear to disintegrate readily on exposure to the elements, for much of the coal in the old dumps at Suquash appears to be little affected except in lustre by its exposure of several years.*
>
> *The shale bands in the coal seam are of two kinds, - the soft material which separates readily from the coal and which is called a "parting", and the harder layers which are not readily separable but which hold the bands of coal together and are consequently called "binders". Some of the harder shale bands are sandy and some carry stringers of bony coal. The inclusion or rejection of this material affects not only the analysis of the seam but also the size of the mined product."*

Hope and Louttit (1953, page 26) reported the follow ng analysis for their grab sample of coal from the foot of the mine's shaft:

"Moisture	*5.7%*
Volatile Combustible Matter	*36.2%*
Fixed Carbon	*47.1%*
Ash	*11.0%*
Sulphur	*0.98%*
Calorific Value	*11,580 B.T.U.'s per lb."*

A channel sample of coal, probably taken at locality H3 within the mine, was analysed by the B.C. Department of Lands & Forests on November 29, 1952 (Hope and Louttit, page 27):

"Department of Lands & Forests.
Victoria, British Columbia.
File 0173047 Lab. Sample 194-52

Sample Origin: *Suquash Collieries.*

Description: *Channel sample of coal representing 47" in a total seam thickness of 78" on the 170' level. All heavy partings discarded.*

Date Received: *November 26, 1952.*

Moisture retained at 99.9% Humidity: *Capacity Moisture %* *9.0*

PROXIMATE ANALYSIS:		*As Recd.*	*Cap. Moist.*	*Dried*
Moisture	%	*8.7*	*9.0*	-
Ash	%	*9.0*	*9.0*	*9.8*
Volatile Matter	%	*36.0*	*35.9*	*39.4*
Fixed Carbon	%	*46.3*	*46.1*	*50.8*
ULTIMATE ANALYSIS				
Sulphur	%	*0.4*	*0.4*	*0.4*
Calorific Value Gross B.T.U. per lb		*11200*	*11160*	*12260*
Fuel Ratio (F.C./V.M.		*1.3*		
Coking properties:		*Agglomerating. Free Swelling Index 1½. Soft weak coke.*		

Remarks: Classification. High Volatile 'C' Bituminous.
M.M.Free. Dry F.C.% *56.9*
M.M.Free Mo, BTU *12520*
M.M.Free Dry, BTU *13760"*

Hope and Louttit (*op.cit.*, page 30) also reported grindability test results for the Suquash coal:

"In addition to the foregoing analyses a report from the Bureau of Mines indicates that the results of Grindability Tests made by the Bureau on samples of Suquash coals taken from the 170' level showed a factor of 42.9 (Hardgrove).

This rating on the Hardgrove Index shows this coal to be relatively a very hard coal which means that in the handling, transporting, and shipping of the finished product a minimum of fines will result."

13 SAMPLE PREPARATION, ANALYSES AND SECURITY

13.1 STATEMENT OF RESPONSIBILITY

The author of the present report disclaims responsibility for sample preparation, analyses and sample security concerning historic samples from the Suquash property.

No new samples were taken during the November 2002 geological reconnaissance of the property.

13.2 SAMPLE PREPARATION, TESTING AND CERTIFICATION DETAILS

No information is available concerning sample preparation, testing and certification during past exploration at Suquash.

13.2.1 QUALITY-CONTROL MEASURES

No information is available concerning quality-control measures related to coal sampling during past exploration at Suquash.

13.2 SAMPLE SECURITY PRECAUTIONS

No information is available concerning sample security provisions during past exploration at Suquash.

13.3 ASSESSMENT OF SAMPLING AND ANALYSIS

Analytical methods used in early (pre-1974) work at Suquash are unknown. Coal quality results were reported in the customary terms of 'proximate analysis', but no mention was made of the standards and methods employed.

During B.C. Hydro's 1974 exploration programme, coal analyses were done by Commercial Testing and Engineering Co.. At the time, CT&E conducted a great deal of business with Western Canadian coal firms, and could reasonably be expected to have followed good analytical practices for coal samples (although their certificates, as reproduced in the report by Saunders (1975) do not actually state the analytical methods used).

No analytical work was reported for the 1980 exploration programme (Summersgill, 1980).

In the author's opinion, coal quality data presently available for the Suquash coals is of sufficient quality to indicate the general rank of the coals, but insufficient to determine the partitioning of ash and sulphur between different portions of any of the coal beds.

- The early work by Daniels (1919b) and by the staff of Hope Engineering (1953) apparently focussed on determining the coal quality that might be available at Suquash if selective mining methods were undertaken, including underground sorting and rejection of visible rock bands from the coal, or preferential shearing and cutting in rock bands within the worked coal bed.
- Later work by Dolmage Campbell & Associates (Saunders, 1975a) apparently focussed on determining what quality might be obtainable in a bulk underground-mining situation, taking all carbonaceous or coaly material in a given coal zone.

13.5.1 DISCUSSION

While the 'coal zone' concept has some validity in that it recognises the likelihood that mining crews are likely to take adjoining carbonaceous rocks along with the coal beds (the author from her own experience

is acutely aware of how difficult it is to distinguish between black coal and black rock when the working-face is half-hidden by mining equipment and its accompanying dust-clouds or water-sprays), it renders more difficult any meaningful comparison of the physical and chemical properties of coals and rock partings.

Lack of detailed coal-quality data is not regarded to significantly affect the validity of the present preliminary study of the Suquash coal property, since the question at hand is essentially "is there any mineable coal there?"

However, future work should include consideration of coal-analytical protocols which would allow for the consideration and mapping of the quality of individual sub-sections or 'leaves' of the major coal beds. This consideration is particularly important given the likelihood that splitting and rejoining of coal beds may be a major control on the mineability of the Suquash coals.

14 DATA VERIFICATION

Other than the limited amount of information gleaned from traversing some of the roads and shorelines at Suquash during two days in November 2002, data used in the preparation of this report (including borehole records, geological reports and mine plans) were collected by the author from archives, published papers, and government files.

Diligent efforts were made to ensure that records were properly copied and transcribed from these sources, but the quality of the underlying data remains an open question, since the author did not collect the original data herself; she accordingly disclaims any responsibility for their accuracy.

14.1 DISCUSSION

There appears to be no reason to suspect that the Suquash exploration data have been tampered with, censored, or altered in any way. However, some of the coal-bed sections reported from apparently-identical locations in the Suquash Mine differ in detail, both as to thickness and lithology of individual coal and rock bands. Some of this variability may be due to rapid geological variations in the coal bed; equally plausible is the 'different eyeballs' effect of various workers attempting to describe the same section while working from within different schemes of geological description. In essence, one cannot expect that other geologists will have seen and described geological features that lay outside their personal understanding of coal geology.

15 ADJACENT PROPERTIES

Other than the coal licences which are the subject of the present report, no other active coal properties are known to presently exist at Suquash. However, most of the adjoining areas have in the past been held under Crown coal licences, or as freehold coal lands.

15.1 EXPLORATION DATA FROM ADJOINING PROPERTIES

Borehole records from nearby portions of the Suquash coalfield are held in the British Columbia Archives (see Buckham, 1953) in Victoria, B.C., and in the University of Washington Archives in Seattle, Washington (see reports by Daniels (1919b) and Evans (1925)).

Copies of these records are held by Westwater Mining Ltd., and have also been presented to Priority Ventures Ltd. for retention in their files. Locations of these boreholes are shown on **Figure 5**, where their position outside the Suquash coal property is clearly shown. Interpretations of the results of these boreholes are further incorporated in **Tables 3** and **4**.

The author of the present report has made diligent efforts to cross-check the records and locations of boreholes sited on adjoining properties, by comparing the different versions of logs and location maps in existence. She has examined the available downhole geophysical logs for the Filtrol boreholes.

In resource calculations, historic borehole data confidence factors of 0.80 have been applied to coal resource volumes calculated on the basis of historic borehole data. This factor represents the author's best-guess estimate of the possible errors in collection, reporting and historic transcription of data from the boreholes concerned, regardless of whether these old boreholes are within or outside the present boundaries of the Suquash coal property.

The author has been unable to verify the accuracy and precision of historic borehole records, since she was not present to log their cores. Borehole data from adjoining properties, and the information contained therein, is not necessarily indicative of the coal thickness and quality within the Suquash coal property.

16 COAL PROCESSING AND METALLURGICAL TESTING

No advanced coal-processing testwork, such as froth flotation or pilot-plant testing, has been done on the Suquash coals. Nor have advanced coking tests such as Grey-King testing, or drum and shatter tests, been done.

17 COAL RESOURCE ESTIMATES

Results of the 2001 exploration programme, taken together with results of earlier drilling by Canadian Collieries and Weldwood, serve as the basis for coal resource estimates covering the Suquash coal licences. Coal resource calculations are based on borehole intersections of the Suquash No.2 and No.5 coal beds only, as presented in **Tables 4, 9,** and **10.**

Coal resources at Suquash are hosted by the Lower Division of the Suquash Formation. Coals of potential interest are not known to outcrop within the Suquash coal licences, but may subcrop below Drift along the southwestern margin of the property.

17.1 STATEMENT OF RESPONSIBILITY

Resource estimates were made by the author in her capacity as a consulting geologist; she is qualified to make such estimates by virtue of her prior industrial experience with such studies.

17.2 SUMMARY OF RESOURCE EVALUATION

The procedure set forth in GSC Paper 88-21 (Hughes *et al*, 1989) was used to define coal resources within the Suquash coal property.

Estimates have been made for two cases:

- **Case A** for underground-mineable coals of immediate interest; and
- **Case B** for underground-mineable coals of future interest; and
- **Case C** for coals of future interest for non-conventional exploitation.

Estimates for each case were constrained as set forth in **Table 8**, below. The resource estimates for each case are presented as **Tables 9, 10** and **11.**

To summarise, measured and indicated coal resources of immediate interest for underground mining (**Case A**) total 4.28 megatonnes; measured and indicated coal resources of future interest for underground mining (**Case B**) total 4.28 megatonnes, and measured and indicated coal resources of future interest for non-conventional exploitation (**Case C**) total 4.28 megatonnes. *These figures are identical, because there are presently no identified drill intersections at Suquash which would solely qualify under 'future interest' for underground mining or non-conventional exploitation.*

Table 8: Coal resource evaluation constraints:

Constraints	***Case A:** Resources of immediate interest for underground mining*	***Case B:** Resources of future interest for underground mining*	***Case B:** Resources of future interest for non-conventional exploitation*
Coal-rock thickness ratio	2:1 (66⅔% by thickness)	1.5:1 (60% by thickness)	1.5:1 (60% by thickness)
Maximum rock parting thickness	30 cm	50 cm	50 cm
Minimum coal bed thickness	60 cm	45 cm	45 cm
Minimum gross seam thickness	150 cm	100 cm	100 cm
Maximum cover depth	600 m	900 m	1500 m

Source: GSC Paper 88-21 by Hughes and others (1989). Geology type is assumed to be 'moderate,' as defined in Paper 88-21

17.2.1 COAL RESOURCE BLOCKS

Coal resource blocks were defined by drawing polygons around each borehole, such that the boundaries of adjoining polygons are straight lines equidistant between pairs of boreholes. Each polygon was then subdivided according to distance from the nearest borehole, with successively-greater distances ascribed to

measured (0 to 450 m), indicated (450 to 900 m) and inferred (900 to 2400 m) assurance-of-existence of coal resources.

Only those blocks for which resources have been identified have been drawn, and given a serial number, on **Figure 3**. This drawing therefore also depicts all areas where presently-identified resources are located within the Suquash coal property.

Blocks 1 through 4 are developed in the Suquash No.2 coal bed. Block 1 consists of areas within the existing, probably flooded, coal mine; considerable rehabilitation work would probably have to be done before this coal could be mined. Block 2 consists of an adjoining block of coal, 150 metres wide, which would have to be left unmined unless the existing workings were dewatered and made safe. Blocks 3 and 4 consist of coal further away from the mine, which could conceivably be accessed without re-entering the old mine.

Caution to the reader: the net coal thickness used in Blocks 1 through 4 is based on borehole SQ-1, and resource block radii are also based on this borehole. Although a considerable body of geological data is on hand for the mine, it was not factored into the resource estimate since to do so would involve a fairly exhaustive and detailed set of resource block calculations, which would be beyond the scope of this preliminary study. The reader is therefore cautioned that geological data from the old workings, if incorporated into coal-resource calculations, could either decrease or increase the volume of the resource near the mine.

Blocks 5 through 8 are developed in the Suquash No.5 coal bed. All four of these blocks are based on the intersection of the No.5 bed as interpreted to have been obtained in borehole SU-80-1.

17.2.2 METHOD OF RESOURCE CALCULATION

Coal resources for each block were determined by:

a) multiplying the net thickness of coal (in metres), by

b) the area of the block (in hectares), by

c) a specific gravity factor (assumed to be 1.45 tonnes per cubic metre), by

d) 10,000 (dimensional conversion from hectares to square metres), by

e) anticipated continuity factor, by

f) historic borehole data confidence factor.

17.2.2.1 Coal resource equation

In algebraic terms:

Coal resources in tonnes: a x b x c x d x e x f

17.2.2.2 Derivation of factors

Each of these constituent factors were determined as follows:

a) net coal thickness was taken from core descriptions and geophysical logs (where available) for each borehole. Bulk density logs were preferred for geophysical interpretation, supplemented by gamma-ray and electric logs where available. Coalbed thickness were interpreted from density logs by taking the midpoint of inflection zones (Hoffman and others, 1982).

b) area of blocks for small areas was calculated by dividing them into triangles, rectangles and circles, and using standard geometric formulae to calculate their sizes; large areas were measured by overlaying a transparent grid of squares of known area over each block, counting the squares and fractions thereof, and then converting the number of squares to an area in hectares.

c) specific gravity factor was determined by constructing a crossplot (**Chart 3**) of measured specific gravity of several coal and rock samples from B.C. Hydro's borehole S-74-5 against the ash yield of the samples (Saunders, 1975a). From the crossplot, a nominal 20% ash coal was thus estimated to have a specific gravity of 1.45 tonnes per cubic metre.

Note that the selection of 20% ash is arbitrarily chosen for convenience, but it corresponds reasonably well with the 'clean' coal ash yields reported by Joseph Daniels (1919b) from Suquash Colliery.

d) conversion from hectares to square metres was by simple unit conversion: 1 hectare = 10,000 square metres.

e) anticipated continuity factors ranging from 0.60 to 0.80 were determined by the author's subjective consideration of the likely continuity of the coal in question through the area under consideration. Geological 'hazards' here weighed together include possible splits, pinch-outs and washouts of the coals. Also considered here was the known and suspected presence of mine workings which would have already taken out some of the coal.

The rationale for the geological component of this factor is the recognition that no coal bed (and no precursory peat-forming mire) continues endlessly throughout a given sedimentary basin. Paleogeographic confidence factors vary according to the author's judgement of individual cases. These factors could perhaps be more closely constrained by additional drilling at Suquash, coupled with model studies of geologically-analogous mined-out areas elsewhere in the Suquash coalfield.

f) historic borehole data confidence factors of 0.80 have been applied to coal resource volumes calculated on the basis of historic borehole data. This factor represents the author's best-guess estimate of the possible errors in collection, reporting, transcription and interpretation of data from the boreholes concerned.

Table 9: Coal resources of immediate interest for underground mining at Suquash

Constraints: minimum gross thickness 1.50 metres; minimum net:gross thickness ratio 1:1.5, maximum rock parting thickness 0.30 m; maximum cover depth 600 metres. Assumption: specific gravity 1.45 Te/m³

			Bed thickness (m)			Geological confidence factors (multipliers)				
Block	Borehole	Coal bed	Gross	Net	Area (Ha)	Due to possible discon-tinuities	Due to historic borehole data	Measured resource (Te)	Indicated resource (Te)	Inferred resource (Te)
1-m	SQ-1	No.2	1.75	1.45	6.9	0.80	0.80	92,846		
2-m	SQ-1	No.2	1.75	1.45	6.4	0.85	0.80	91,501		
3-m	SQ-1	No.2	1.75	1.45	4.4	0.75	0.80	55,506		
4-d	SQ-1	No.2	1.75	1.45	3.1	0.60	0.80		31,285	
5-m	SU-80-1	No.5	3.45	2.42	63.6	0.80	0.80	1,428,303		
6-d	SU-80-1	No.5	3.45	2.42	131.4	0.70	0.80		2,582,063	
7-f	SU-80-1	No.5	3.45	2.42	5.7	0.70	0.80			112,007
8-f	SU-80-1	No.5	3.45	2.42	333.4	0.60	0.80			5,615,523
								1,668,156	2,613,348	5,727,530
							Total (Te):	4,281,504		

Assurance:

m: measured d: indicated f: inferred

see Figure 3 for locations

Abbreviations:

Te: tonnes m³: cubic metres

Table 10: Coal resources of future interest for underground mining at Suquash

Constraints: minimum gross thickness 1 metre; minimum net:gross thickness ratio 3:5, maximum rock parting thickness 0.50 m; maximum cover depth 900 metres. Assumption: specific gravity 1.45 Te/m³

			Bed thickness (m)			Geological confidence factors (multipliers)				
Block	Borehole	Coal bed	Gross	Net	Area (Ha)	Due to possible discon-tinuities	Due to historic borehole data	Measured resource (Te)	Indicated resource (Te)	Inferred resource (Te)
1-m	SQ-1	No.2	1.75	1.45	6.9	0.80	0.80	92,846		
2-m	SQ-1	No.2	1.75	1.45	6.4	0.85	0.80	91,501		
3-m	SQ-1	No.2	1.75	1.45	4.4	0.75	0.80	55,506		
4-d	SQ-1	No.2	1.75	1.45	3.1	0.60	0.80		31,285	
5-m	SU-80-1	No.5	3.45	2.42	63.6	0.80	0.80	1,428,303		
6-d	SU-80-1	No.5	3.45	2.42	131.4	0.70	0.80		2,582,063	
7-f	SU-80-1	No.5	3.45	2.42	5.7	0.70	0.80			112,007
8-f	SU-80-1	No.5	3.45	2.42	333.4	0.60	0.80			5,615,523
								1,668,156	2,613,348	5,727,530
							Total (Te):	4,281,504		

Assurance:

m: measured d: indicated f: inferred

see Figure 3 for locations

Abbreviations:

Te: tonnes m³: cubic metres

Table 11: Coal resources of future interest for non-conventional exploitation at Suquash

Constraints: minimum gross thickness 1 metres; minimum net:gross thickness ratio 3:5, maximum rock parting thickness 0.50 m; maximum cover depth 1500 metres. Assumption: specific gravity 1.45 Te/m³

			Bed thickness (m)			Geological confidence factors (multipliers)				
Block	Borehole	Coal bed	Gross	Net	Area (Ha)	Due to possible discon-tinuities	Due to historic borehole data	Measured resource (Te)	Indicated resource (Te)	Inferred resource (Te)
1-m	SQ-1	No.2	1.75	1.45	6.9	0.80	0.80	92,846		
2-m	SQ-1	No.2	1.75	1.45	6.4	0.85	0.80	91,501		
3-m	SQ-1	No.2	1.75	1.45	4.4	0.75	0.80	55,506		
4-d	SQ-1	No.2	1.75	1.45	3.1	0.60	0.80		31,285	
5-m	SU-80-1	No.5	3.45	2.42	63.6	0.80	0.80	1,428,303		
6-d	SU-80-1	No.5	3.45	2.42	131.4	0.70	0.80		2,582,063	
7-f	SU-80-1	No.5	3.45	2.42	5.7	0.70	0.80			112,007
8-f	SU-80-1	No.5	3.45	2.42	333.4	0.60	0.80			5,615,523
								1,668,156	2,613,348	5,727,530
							Total (Te):	4,281,504		

Assurance:

m: measured d: indicated f: inferred

see Figure 3 for locations

Abbreviations:

Te: tonnes m³: cubic metres

Table 12: Coal resource summary for Suquash coal licences

Geology type: Moderate

		Resources of Immediate Interest			Resources of Future Interest			
Deposit Type	ASTM coal rank	Measured	Indicated	Inferred	Measured	Indicated	Inferred	Speculative
Surface	High volatile 'C' bituminous	Not determined						
Under-ground		1.668.156	2.613.348	5.727.530	1.668,156	2,613,348	5,727,530	Not determined
Non-conven-tional		By definition (according to GSC Paper 88-21), there are no non-conventional resources of immediate interest			1.668.156	2,613,348	5,727,530	
Sterilised		Not determined						

Data source: resource data for this table are derived from **Tables 9, 10** and **11.**

17.3 DISCUSSION

Most of the coals of the Suquash Formation fail to meet presently-identified standards for immediate or future interest. There appears to be no areal overlap between the identified resource blocks in the two coal beds which do locally become thick enough to consider for underground mining. This situation is exacerbated by the wide spacing between boreholes in the southern half of the Suquash coal licences, which reduces the level-of-assurance of coal resources in this area. The use of historic borehole data further impacts resource quantities in all resource blocks, since all tonneages are based on old data.

As **Table 12** shows, the Suquash coal licences contain measured and indicated coal resources of 4,28 million tonnes of immediate interest for underground coal mining, mostly in the southeastern part of the property. Some of the resources lie in the northeastern part of the property, adjacent to and within an abandoned underground mine. The aggregate measured and indicated resources in this area are just over 270,000 tonnes. The mine would have to be dewatered and made safe before most of the 270,000 tonnes of resources could be worked.

Most of the coals at Suquash are either thinner than the requisite gross thickness of 1.5 metres, have rock partings greater than 30 cm thick, or they contain an aggregate thickness of thinner rock partings which is too thick to meet the requisite 2-to-1 coal-to-rock ratio.

The situation for coals of future interest for underground coal mining, and for coals of future interest for non-conventional exploitation, is identical. There are no identified resources at Suquash which fail to meet the criteria for 'immediate interest', so the 'future' resource figures are identical to the 'immediate' resource figures.

It should be borne in mind that GSC Paper 88-21 does not contemplate the existence of coals of immediate interest for non-conventional exploitation; all non-conventional resources are by definition considered as being of future interest only.

17.3.1 CAVEATS

a. *Coal resources do not have demonstrated economic viability.*

b. *In considering the coal resources at Suquash, it must be borne in mind that the coals which have to date been identified as being of interest for underground mining tend to be dirty, with numerous rock partings. Net coal thicknesses and net-to-gross ratios of the Suquash coals are therefore marginal for mineability.*

c. *All of the identified coal resources are defined by historic borehole and mine data, both within and beyond the boundaries of the property.*

All of the major coal beds at Suquash contain rock partings, which would act to reduce the yield of clean coal out of run-of-mine production.

The presence of an existing, abandoned, underground coal mine in the northeastern corner of the Suquash coal property has a potential adverse impact on recoverability of coal in that area, since an adequate barrier of unworked coal must be left adjacent to the mine, unless the mine's workings are pumped out, stabilised and adequately ventilated.

Coal resources available to mining may be adversely impacted by environmental or socio-economic policy decisions made by local, provincial and federal government agencies. The unsettled status of aboriginal land claims in British Columbia may also adversely impact the value and mineability of the Suquash coals.

18 EXPLORATORY COST ANALYSIS

No recent exploratory work of any significance is known to have been done at Suquash, other than the very cursory ground-based geological reconnaissance conducted during the present study. No relevant detailed cost data are therefore available to guide planning of future exploration programmes at Suquash.

The author, acting as a consulting geologist, managed Priority Venture's recent drilling programmes in the Comox coalfield, further south on Vancouver Island. Working in this relatively well-settled area, she found that overall drilling costs of a carefully-executed diamond-drill programme were approximately $260 per metre.

Given the greater isolation of the Suquash property, overall programme costs may be somewhat higher, perhaps $300 per metre in round terms.

Directions for cost control in future drilling programmes may include:

- Reducing the amount of coring, by triconing down through the upper and middle Suquash Formation, and starting coring at the top of the Lower Division of the formation.
- Making more effective use of settling-tanks and desanding equipment, in aid of recycling drilling mud (thus reducing chemical and water-supply costs).
- Drilling at reduced diameter, such as NQ (versus the more customary HQ size used in coal exploration). This might, however, adversely affect core recovery, and could limit the option to use certain downhole geophysical sondes.

18.1 DISCUSSION

Priority Ventures' recent drilling programmes in the Comox coalfield included a variety of ancillary services, such as water supply trucking and security guards, which might not be needed at Suquash.

Furthermore, Suquash may, by virtue of its isolation, lend itself to running a trailer- or tent- based exploration camp, which may conceivably be less expensive than the costs of housing crews in motels during tourist season. An on-site camp would certainly reduce travel time to and from the drill site, an important consideration for supervisory and technical staff.

More detailed cost analyses should be done during planning for possible future drill programmes at Suquash; an attempt to do so now would be premature and very probably meaningless without site-specific cost quotations.

19 INTERPRETATION AND CONCLUSIONS

Drilling results to date indicate the Suquash coals tend to contain numerous rock partings. Their gross thickness and net-to-gross ratios are generally insufficient for underground mining, with the exception of those areas where more than one coal bed has coalesced to form a thicker composite bed.

As it stands, only the north-central portion of the property (centred on Coal Licence 391841 and the old Suquash Colliery) has been effectively explored. Other parts of the property are only partially explored, and a fair number of the existing boreholes have not reached the major exploration targets (the Suquash No.2 and No.5 coal beds).

Within the intensely-explored area, only the No.2 coal bed (and the locally-adjacent No.2 Rider coal) show any remaining potential for discovery of coal resources of immediate or future interest for underground coal mining. The No.2 coal bed in this area is relatively shallow (typically 50 to 90 metres), so it does have some modest merit as a target for further exploration, with a view to finding enough coal to support a very small underground mine. This coal is almost certainly too shallow to be of interest for coalbed gas exploration.

Outside the intensely-explored area, the best exploration target (based on drilling to date) is the deeper Suquash No.5 coal bed, which was found to be sufficiently thick (albeit containing numerous rock partings) in borehole SU-80-1 to consider it worthy of further work. Although it meets the standards for being of immediate interest for underground mining, the No.5 coal bed might be a doubtful mining proposition because of its depth and its apparent dirtiness. The coal may, however, hold some interest for coalbed gas exploration.

20 RECOMMENDATIONS

Further work should focus on refining the understanding of the structural geology of the Suquash Formation, within and adjacent to Priority Ventures' coal licences, followed by confirming and extending areas of thick coal development by means of cored boreholes. Consideration should be given to canister-testing of coals encountered during drilling, as this may provide some validation of the presently-speculative potential for coalbed gas within the Suquash Formation.

20.1 PHASE 1: GEOLOGICAL MAPPING

In the present study, only a very cursory geological reconnaissance (effectively a scoping-out of the mapping problem) was done along the shoreline near the old coal mines. Further mapping should focus on previously-reported areas of bedrock exposure, within the intertidal zone of the coastline, and along major creeks. Verification of positions of historic boreholes should also be sought.

Geological mapping should be co-ordinated with the tides and weather forecasts, to ensure safety for the mappers, as well as maximising the chance of seeing anything useful along the shoreline. Consideration should be given to basing a mapping party out of the Cluxewe Indian Reserve, where cottages are available for rent; this would cut down on travel time, and help reduce the risks of back-country driving during hours of darkness.

Mapping should be done on blown-up segments of 1:20,000-scale TRIM maps, annotated with foreshore features visible on existing air photos. Copies of older air photos should be obtained, as these may help in the search for old boreholes and access trails.

Samples of coal (which may be found in outcrops) should be analysed for fundamental rank and quality parameters such as proximate analysis, total sulphur, and calorific value. Since it is unlikely that unweathered coal will be found at outcrop, rank values will probably represent minima, but their variation across the mapped area may help elucidate property-scale trends in level of organic maturation of the coals (and, indirectly hence, potential for generation of natural gas from organic-rich source rocks).

Table 13: Proposed Phase 1 budget

Materiel:		
Base maps and aerial photographs		$250
Fieldwork:		
Geological mapping by one working party (mapper and assistant)	10 days at $500/day	$5,000
Subsistence (self-catering, using rented cottage)	10 days at $100/day	$1,000
Transport (vehicle mileage, fuel and oil)	800 km at $0.55/km	$440
Analytical:		
Proximate, sulphur and calorific analyses	10 coals at $240 each	$2,400
Reporting:		
Presentation of geological report, with recommended for drill sites	(all-in)	$4,000
Subtotal		$13,090
	Contingency @ 10%	$1,310
	Total budgeted cost	$14,400

The proposed budget of $14,400 works out to about $7.00 per hectare for the whole property, given its current extent of 2016 hectares.

20.2 PHASE 2: DRILLING

Up to three additional partially-cored boreholes should be drilled within the Suquash coal licences. Coring should be programmed to commence in the Lower Division of the Suquash Formation, allowing the recovery of coal cores from the Suquash No.2 and No.5 coal beds and all coals between them.

If practicable, one of the holes should be drilled to pre-Cretaceous basement, to test whether coals are present at depth in the Coal Harbour Group.

Canister tests should be undertake of coals which are found in the cores, provided that they are recovered in sufficiently sound condition as to afford meaningful test results.

Selection of locations, individual depths and detailed targets of possible boreholes is beyond the scope of the present study, but should be addressed in detail following completion of Phase 1 geological studies.

Presentation of a drilling budget is regarded as premature, owing to lack of current information as to costs of services and supplies in the Suquash Basin. Local suppliers may be able to help identify cost-effective solutions for drilling in the area, conceivably including local sourcing of drilling equipment and crews.

21 REFERENCES

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22 CLOSURE

22.1 CERTIFICATE OF AUTHOR

C. Gwyneth Cathyl-Bickford, P.Geo.
Consulting Geologist

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Telephone: (403) 701-3456
Telefax: (250) 336-2895
Electronic mail: <coalmine@island.net>

I, C. Gwyneth Cathyl-Bickford, P.Geo. do hereby certify that:

1. I am currently employed as Principal Geologist and Managing Director by:

   Westwater Mining Ltd.
   88 Glamis Gardens SW.
   Calgary, Alberta, T3E 6S4 Canada

2. I graduated with a B.Sc. degree in geological science from the University of British Columbia in 1978. In addition, I have obtained a M.Sc. degree in geological science from the University of British Columbia in 1993.
3. I am a member of the Association of Professional Engineers and Geoscientists of British Columbia, the Coal Division of the Canadian Institute of Mining and Metallurgy, the Society for Mining, Metallurgy and Exploration. and the Society of Petroleum Engineers, and I am licensed as a geologist in the State of Washington, USA.
4. I have worked as a geologist for a total of 24 years since my graduation from university.
5. I have read the definition of "qualified person" set out in National Instrument 43-101 ("NI 43-101") and certify that by reason of my education. affiliation with a professional association (as defined in NI 43-101) and past relevant work experience, I fulfil the requirements to be a "qualified person" for the purposes of NI 43-101.
6. I am the author of this report. concerning the Suquash coal property. I visited the property on November 10th and 17th, 2002.
7. I have had prior involvement with the Suquash coal property, which is the subject of this report. During February of 2001, I conducted a desk study of the property's geology from archival sources and available assessment reports. The present report supersedes that study.
8. I am not aware of any material fact or material change with respect to the subject matter of this report, which is not reflected within this report, the omission to disclose which makes this report misleading.
9. *I am not independent of the issuer, applying all of the tests in section 1.5 of National Instrument 43-101. The sole test which I cannot presently pass is the income test, as my firm has received the majority of its consulting income from Priority Ventures Ltd. during each the three years immediately preceding the issuance of the present report.*
10. I have read National Instrument 43-101 and Form 43-101 F' and this report has been prepared in compliance with that instrument and form.
11. I consent to the filing of this report with any stock exchange and other regulatory authority, and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of this report.

Dated this 25th day of November, 2002.

C. Gwyneth Cathyl-Bickford, P.Geo.

PROFESSIONAL ENGINEERS AND GEOSCIENTISTS
PROVINCE OF BRITISH COLUMBIA
C. G. C. BICKFORD
25. NOV. 2002

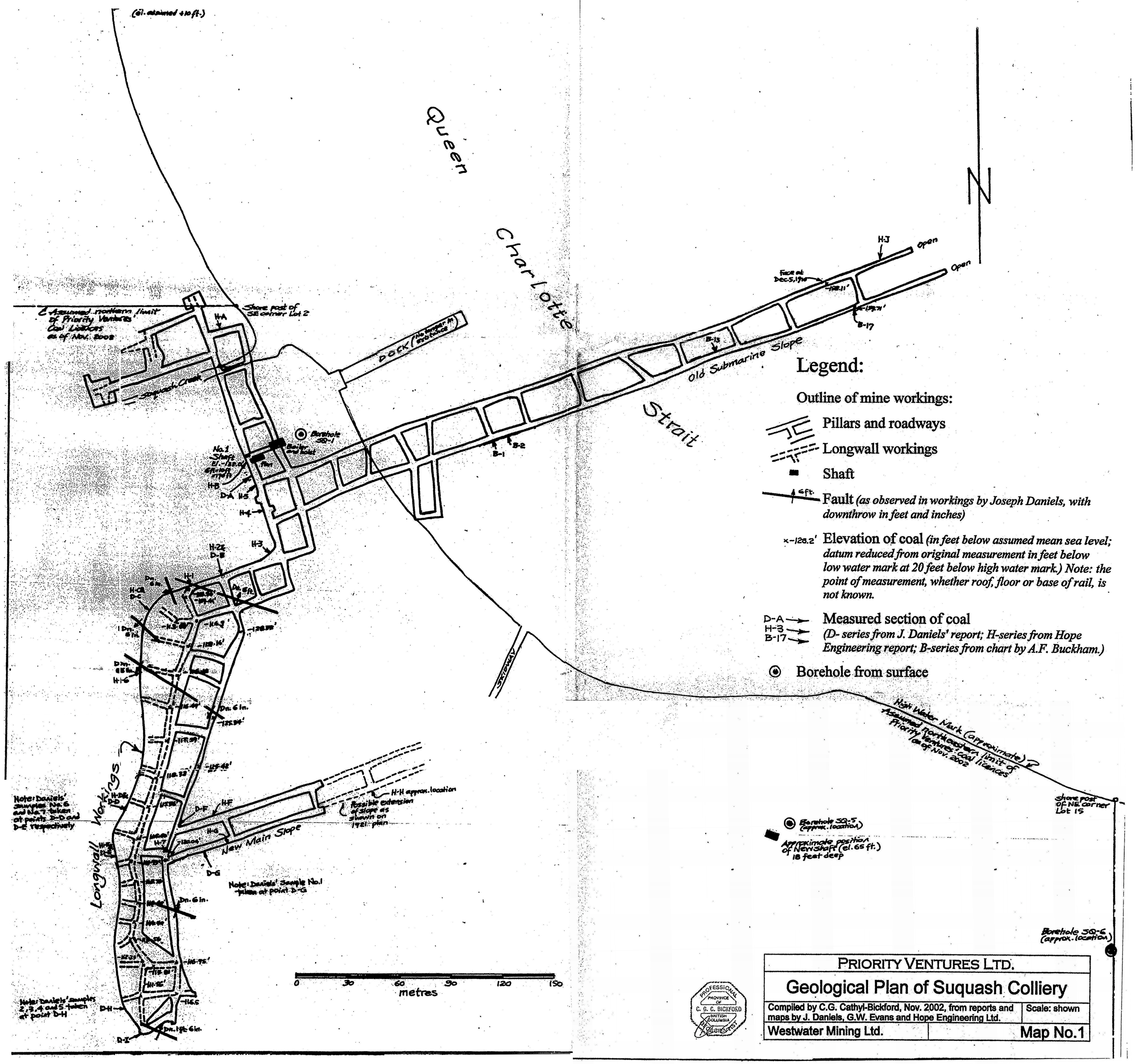
22.2 TRANSMITTAL

This report has been prepared for Priority Ventures Ltd.'s use in accordance with National Instrument 43-101. Every effort has been made to follow the provisions of Form 43-101 F1 as closely as practicable. Herewith our report, effective 14 November 2002.

Respectfully submitted:
Westwater Mining Ltd.

C. Gwyneth Cathyl-Bickford, P.Geo.
Principal Geologist

Sealed 25 November 2002,
at my residence in
Cumberland, B.C.
Telephone: (403) 701-3456



Queen Charlotte Strait
Legend:
Outline of mine workings:
Pillars and roadways
Longwall workings
Shaft
Fault (as observed in workings by Joseph Daniels, with downthrow in feet and inches)
Elevation of coal (in feet below assumed mean sea level; datum reduced from original measurement in feet below low water mark at 20 feet below high water mark.) Note: the point of measurement, whether roof, floor or base of rail, is not known.
Measured section of coal (D- series from J. Daniels' report; H-series from Hope Engineering report; B-series from chart by A.F. Buckham.)
Borehole from surface
Old Submarine Slope
New Main Slope
Longwall Workings
Open
Open
Borehole SQ-1
Suquash Creek
Assumed northern limit of Priority Ventures' Coal Licences as of Nov. 2002
Shore post of SE corner Lot 2
Note: Daniels' samples No.6 and No.7 taken at points D-D and D-E respectively
Note: Daniels' Sample No.1 taken at point D-G
Note: Daniels' samples 2, 3, 4 and 5 taken at point D-H
Possible extension of slope as shown on 1921 plan
H-H approx. location
High Water Mark (approximate)
Assumed northeastern limit of Priority Ventures' coal licences as of Nov. 2002
Shore post of NE corner Lot 15
Borehole SQ-5 (approx. location)
Approximate position of New Shaft (el. 65 ft.) 18 feet deep
Borehole SQ-6 (approx. location)
0 30 60 90 120 150
metres
N
PRIORITY VENTURES LTD.
Geological Plan of Suquash Colliery
Compiled by C.G. Cathyl-Bickford, Nov. 2002, from reports and maps by J. Daniels, G.W. Evans and Hope Engineering Ltd.
Scale: shown
Westwater Mining Ltd.
Map No.1