File

012544

MINE PLAN

PROPERTY FILE

for the

APPLE BAY PROJECT
(PEM100 CHALKY GEYSERITE QUARRY)

Holberg Inlet Area, Wanokana Creek,
Vancouver Island

Longitude 127°14'/Latitude 50°37'
NTS 92L/12E
Nanaimo M.D.

Owned by
HOMEGOLD RESOURCES LTD.
#5-2330 Tyner St.
Port Coquitlam, B.C.
V3C 2Z1
Phone: 604-970-6402
Fax: 604-944-6102
E-mail: jo@HomegoldResources.com
Website: www.HomegoldResources.com

Prepared by

J. T. SHEARER, M.Sc., P.Geo.
Consulting Geologist
Quarry Supervisor #98-3550

November 15, 2000

TABLE OF CONTENTS

LIST OF ILLUSTRATIONS and TABLES

ILLUSTRATIONS

TABLES

1.0 FACT SHEET and SUMMARY

FACT SHEET	
CORPORATE DATA	
PROJECT NAME:	PEM100 Kaolinite Project
COMPANY NAME AND ADDRESS:	Homegold Resources Ltd. Unit 5 – 2330 Tyner St., Port Coquitlam, B.C. V3C 2Z1 Telephone: 604-970-6402 FAX: 604-944-6102 E-mail: jo@homegoldResources.com
CONTACT/TITLE:	J.T. (Jo) Shearer, M.Sc., P.Geo., President Quarry Supervisor #98-3550 Doug Stelling Corporate Advisor,
PROJECT DETAILS	
PROJECT LOCATION:	Apple Bay, north side of Holberg Inlet, Quatsino Sound, NTS 92L/12W, 50 37', 127 14'
ESTIMATED CAPITAL COST:	$1.0 million, approximately
MINERALS:	Kaolinite, Iron and Silica
MINE SYSTEM:	Quarry (negligible overburden or waste)
ESTIMATED PRODUCTION:	240,000 tonnes per year
PROCESS:	Jaw and cone crushers/stockpile
PROPOSED MINE LIFE:	30 years plus
MINERAL POTENTIAL	
GEOLOGICAL POTENTIAL:	5 million tonnes plus
AVERAGE GRADE OF MATERIAL	80 – 84 % Silica
CUT-OFF GRADE:	<2% >20% Al_2O_3
POTENTIAL FOR ADDITIONAL GEOLOGICAL RESERVES:	Several other known zones
LOGISTICS	
ROAD:	Road from Coal Harbour via Wanakana Mainline (13 km)
ACCESS TO SITE:	Truck or Boat
SHIPPING:	Via barge to Vancouver, BC from Port Hardy
POWER SUPPLY:	On-site generation for crusher
WORKFORCE INFORMATION	
OPERATIONAL WORKFORCE:	**Quality Control**: 1 person 10 months per year **Quarrying, crushing and stockpiling:** 4 to 5 people 6 months per year **Shipping:** 2 people 10 months per year **Trucking**: 2 Trucks 10 months per year
CONSTRUCTION WORKFORCE:	10 people for 4 months
HOUSING OPTIONS:	At home for local workers – Coal Harbour/Port Hardy
INDIRECT EMPLOYMENT:	5 to 6 person years (Purchased Services)

SUMMARY

1. Acquisition and a preliminary evaluation of the PEM100 Kaolinite and Chalky Geyserite Quarry was undertaken between October 1999 and August 2000 for Homegold Resources Ltd. The alumina and silica resource at PEM100 is a source for the raw material requirements of the cement plant operated by Tilbury Cement Ltd. in Delta, British Columbia. An option agreement has been negotiated between Homegold and Electra Gold Ltd.

2. A 25-35 metre thick Lower Jurassic sequence of intensely silicified and clay altered rhyolite flows and pyroclastic units of the Bonanza Group outcrop along a 320° trend for more than 800 metres from the PEM100 Quarry towards the Pemberton Hills.

3. The area is covered by the Apple Bay 1-11 and Jody 1 and 2 mineral claims totalling 2000 hectares. The PEM100 geyserite quarry is located on the Apple Bay two claim (20 units) and Jody Claims. A Mining Lease Application is currently being processed. The proposed Phase 1, 2 & 3 quarries will cover about 15.2 hectares. There are 9 other geyserite zones known on the property.

4. Total estimated tonnage produced from the Western Forest Products quarry is approximately 250,000 tons between the late 1970's to present. This quarry has most recently produced coarse stone for road construction.

5. The general chalky geyserite and kaolinite section in the quarry area consists of an upper 20-35 metre thick rhyolite member exhibiting both flow banded and coarse pyroclastic units that have been intensely silicified and clay altered (silica and alumina). This sequence has then undergone intense acid sulphate and advanced argillic alteration. The upper sequence is underlain by a less altered lower sequence of pyritic rhyolitic tuff.

6. Two main sub areas of chalky geyserite and kaolinite have been outlined by limited drilling to date on the PEM100 zone. Area A covers a 60,000m^2 area around the PEM100 quarry. This 27.77m thick zone contains about 3.91 million tonnes of geyserite grading approximately 83.66% SiO_2, 12.49% Al_2O_3 and 0.09% SO_3. Area B is located approximately 150 metres northwest of Area A and it covers a 20,000m^2 area in a saddle between to Wann Knobs. The 21.34m thick Area B zone contains about 1.11 million tonnes of material grading approximately 81.84% SiO_2, 14.33% Al_2O_3 and 0.05% SO_3. The total tonnage and average grade of both Area A and B is 5.02 million tonnes grading 83.26% SiO_2, 12.90% Al_2O_3 and 0.08% SO_3.

7. Two bulk samples were collected from the PEM100 Quarry during 2000. A total of 9000 tonnes of material was mined and trucked to Port Hardy. The first 5400 tonne bulk sample was barged to the Tilbury Cement Plant in Delta, B.C. The second bulk sample ~~was~~ will be shipped to Delta in late ~~September~~ January 2001.

8. Crushing was completed by a one pass 24"x36" jaw crusher and impactor to produce 2" minus product. Trucking to Port Hardy was by 40 tonne and end dump transfer units with transfer trailers.

9. The Mine Plan as outlined in this report proposes a series of 10m benches and 8m berms that give at least a 10 year mine life at 245,000 tonnes per year production (Figure 5A to 5G) and listed in Production Tables.

10. Proposed plans for 2001 call for at least 150,000 tonnes of production on the 100m to 124m bench levels with the crusher situated on the 100m bench to facilitate mucking by front end loader. A drill program and research program into commercial uses of the higher grade (>25% Al_2O_3) will be undertaken by Electra Gold.

Respectfully submitted,

J. T. Shearer, M.Sc., P.Geo.
Quarry Supervisor #98-3550
Consulting Geologist
November 15, 2000

2.0 INTRODUCTION

The Apple Bay 1 – 11 and Jody 1 and 2 mineral claims cover readily accessible silica and alumina resources within the PEM100 Quarry and to the northwest towards the Pemberton Hills. The general geyserite section within the quarry and adjacent areas consists of an approximately 20-35 metre thick Lower Jurassic intensely silicified and clay altered rhyolite unit (flow banded and pyroclastic) above a lower less altered rhyolitic breccia. Drilling in 1999 and 2000 and surface assays indicate that 2 sub areas (Area A and B) contain about 5 million tonnes of material grading an average of 83.26% SiO_2, 12.90% Al_2O_3 and 0.08% SO_3. A third area (Area C) lies between Areas A and B and may contain an additional 4.3 million tonnes of silica-rich geyserite but more detailed drilling is required to determine total tonnage and grades.

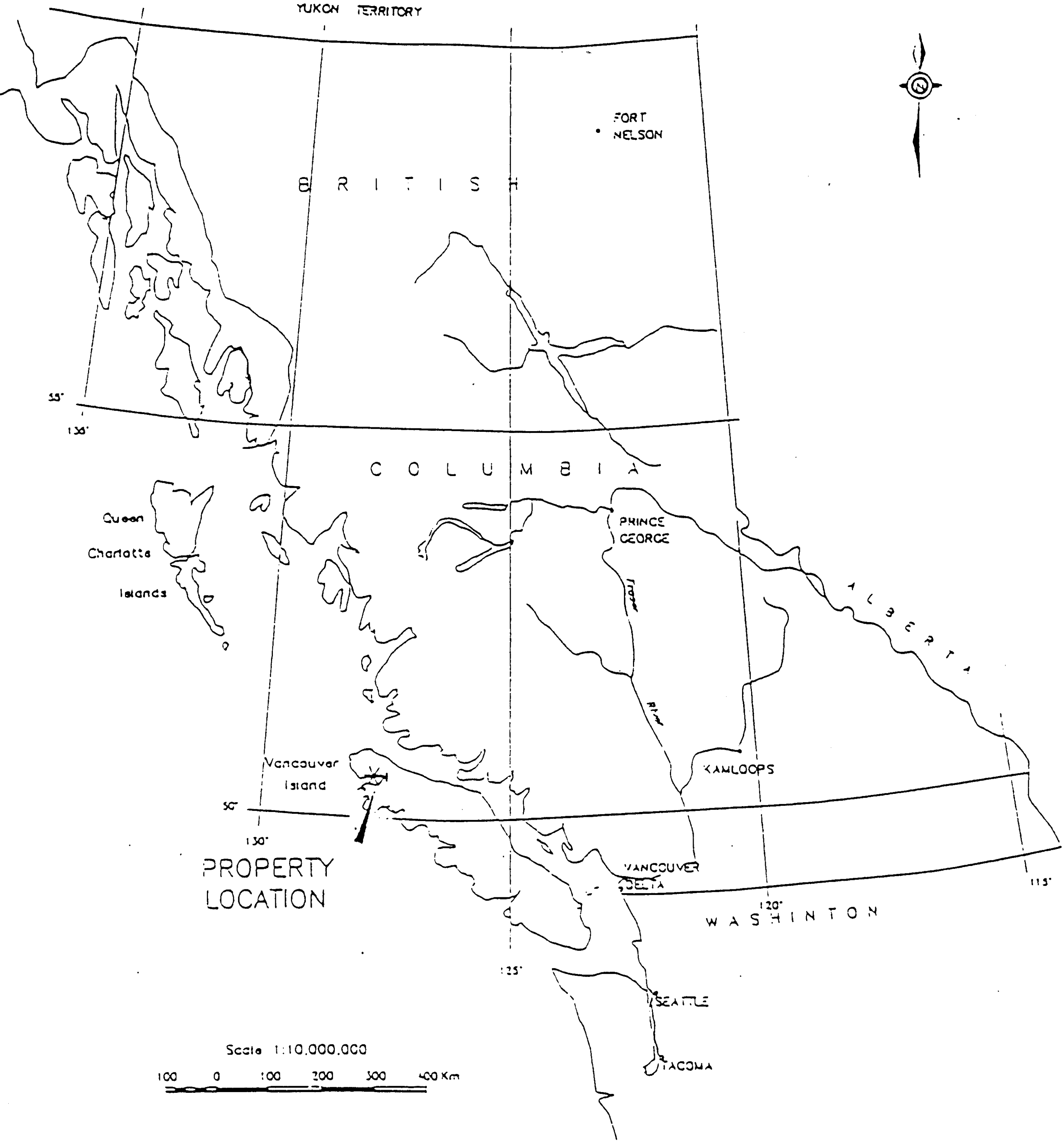
Kaolinite has become an important constituent in many industrial applications. In British Columbia it is primarily used to make high quality paper, as a filler material in the paper making process and to impart a bright white colour and achieve stability qualities to the finished paper product.

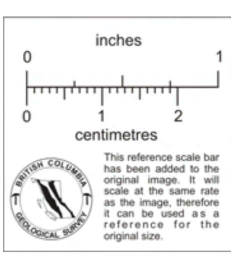
Currently there is no source of high quality kaolinite in British Columbia and, as such, it is imported primarily from Georgia in the eastern United States of America. The closeness of the Apple Bay kaolinite deposits to the large Pulp and Paper Industrial Complexes in British Columbia offers customers a potentially significant cost saving in terms of shipping a locally sourced product. Preliminary testing of the Apple Bay section indicates that the alumina values suggest locally high kaolinite content.

Kaolin accumulations may be either primary, as a result of in situ alteration of alumina-bearing minerals to kaolinite, or secondary as a result of deposition usually in fresh water (Bristow, 1987). If leaching is particularly intense, kaolinite is replaced by bauxite and quartz. Other mechanisms for developing primary deposits include the hydrothermal alteration of rocks by circulating hot water such as deep circulation of water through granitic rocks high in radiogenic elements or solfatara alteration associated with the waning phases of felsic volcanism results from hot water rich in sulphur altering rocks along the route to discharging as geysers and hot springs.

Throughout the property a further 9 geyserite zones have been identified by geological mapping. A 4,500 tonne bulk sample was shipped in 1968 by Lafarge Inc. from a geyserite deposit in central Apple Bay, which is now covered by the Apple Bay One Mineral Claim. The PEM100 Quarry is approximately 12 kilometres west of the village of Coal Harbour and is not directly drained by major streams. The company is committed to develop the deposit in a manner that does not cause significant environmental impact during operation or after mine closure.

A total of 627.29m of diamond drilling was completed in November and December 1999 and March 2000 in 24 holes. Two bulk samples were extracted from the PEM100 Quarry during 2000. A 5400 tonne sample was taken in April 2000. This sample was trucked to Port Hardy and then barged to Tilbury's Cement Plant in Delta B.C. for testing. A second 4000 tonne bulk sample was taken in July 2000. This sample was trucked to Port Hardy and will be shipped to the Tilbury Cement Plant in Delta, B.C. in late January 2001.





HOMEGOLD RESOURCES LTD.				
APPLE BAY PROJECT				
LOCATION MAP				
SCALE as shown	DATE Aug. 00	N.T.S. 92L/12E	WORK BY J. T. Shearer	FIGURE 1

This report documents the results of the work program and experience gained while producing material in 2000 while establishing the first open cut bench. A detail plan is included, which outlines work in 2001 to produce an average of 240,000 tonnes annually of geyserite from which silica and alumina is obtained, further diamond drilling and the initiation of a research program into commercial products made from the higher grade (>25%) Al_2O_3.

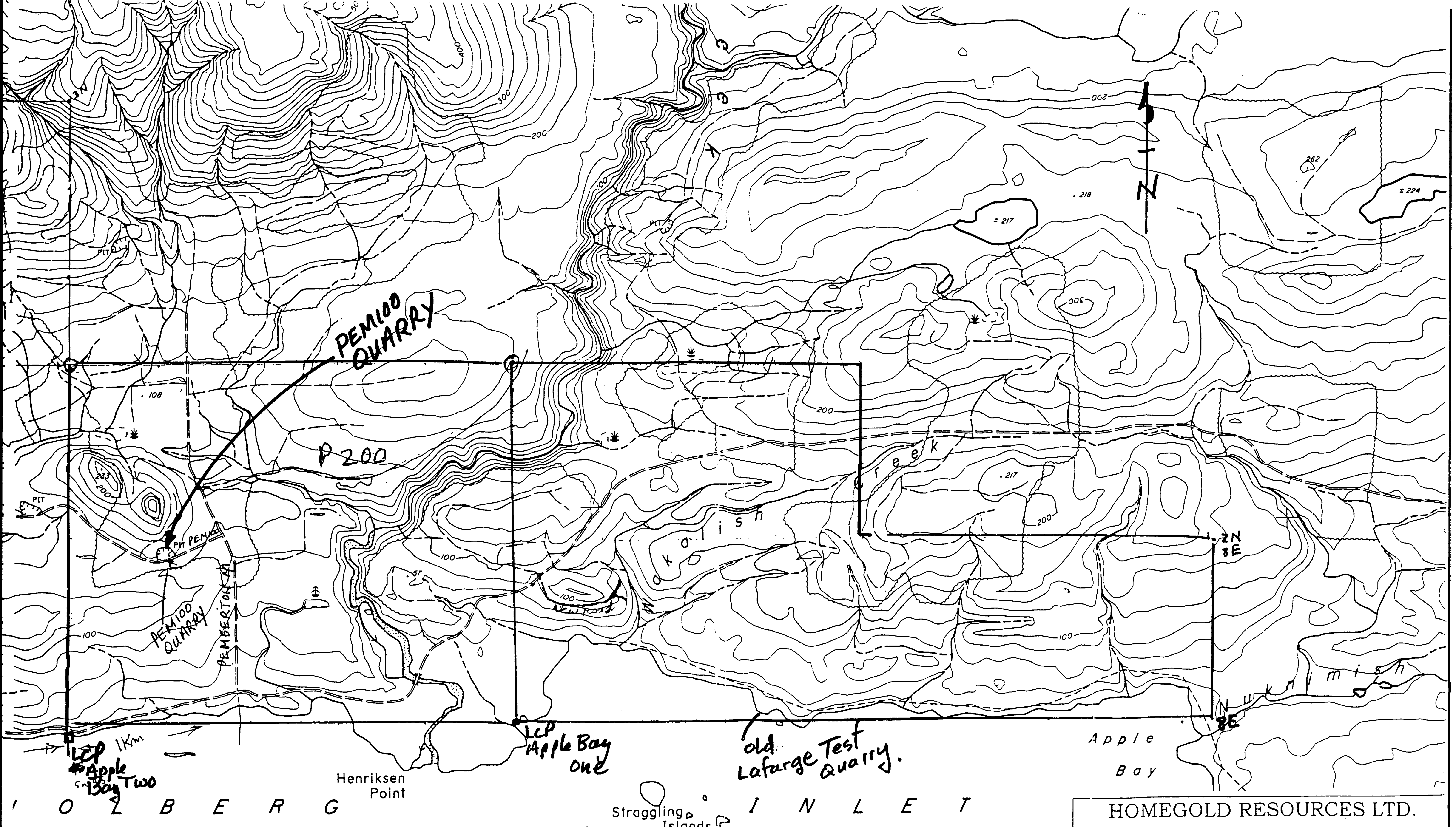
3.0 LOCATION and ACCESS

The Apple Bay 1 - 11 and Jody 1 and 2 mineral claims are situated on rolling terrain with elevations ranging between 0m and 210m. The PEM100 Quarry is at an elevation of approximately 115m. The three Wann Knobs at the PEM100 quarry area gradually rise to the west into the Pemberton Hills, Figure 2 and 3.

Most of the claims are covered by second growth forest, some of which has been thinned. Some of the claims have been logged recently. Most of the logging occurred in 1988. Minor logging was done from the shore in the 1920's.

Access to the claims is gained by travelling south for 16 km from Port Hardy along a paved road to Coal Harbour. From Coal Harbour travel west for 12 km along the Wanokana Mainline logging road to the Pemberton Mainline logging road and turn off onto the P100 branch road.

A road use agreement was negotiated for the year 2000 with Western Forest Products Ltd. the holder of Tree Farm Licence 6. Payments were made based on the amount in cubic metres of geyserite hauled over the road system. This agreement will be renegotiated for subsequent years based on tonnage rather than cubic metres.



SCALE 1:20 000

200 0 200 400 600 800 1000 1200 1400

METRES

Contours genera

Contour interval

Elevations in me

District:

Dist.:

Plan No.

Date:

inches 0 1

centimetres 0 1 2

This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.

HOMEGOLD RESOURCES LTD.				
APPLE BAY PROJECT				
TRIM MAP 1:20,000				
SCALE as 1:20,000	DATE Aug 00	N.T.S. 92L/12E	WORK BY J. T. Shearer	FIGURE 3

4.0 CLAIM STATUS

The principal area of interest is covered by the Apple Bay 1 – 11 and Jody 1 and 2 mineral claims staked under the two-post and Modified Grid Systems and registered in the name of J.T. Shearer and R. W. Howich, Figure 3. A comprehensive legal agreement was executed between R. W. Howich and Homegold Resources Ltd. The interaction between these agreements is beyond the terms of reference of this geological assessment.

TABLE I

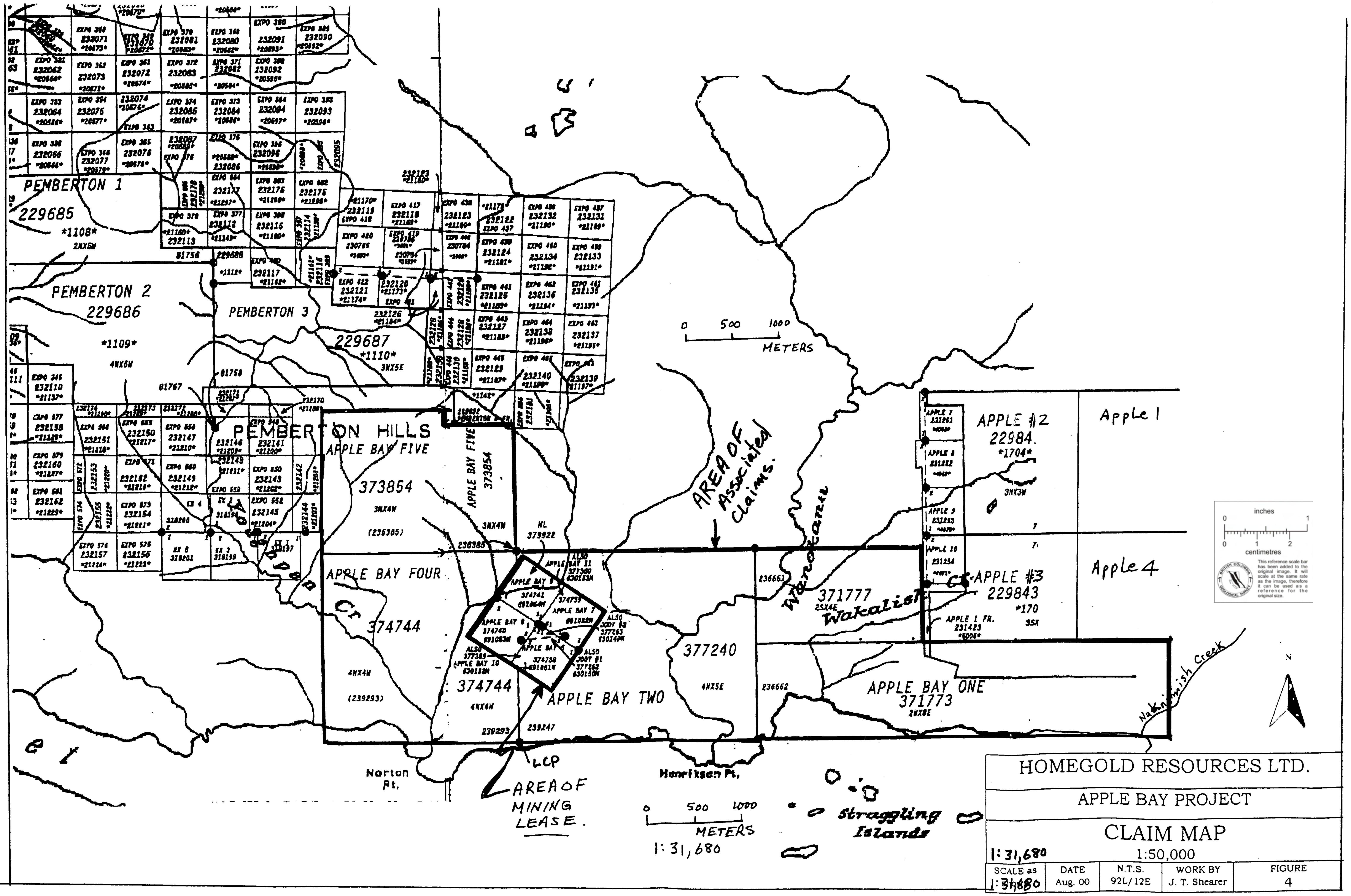
List of Claims

Claim Name	Tenure #	Size	Units	Date Located	* Current Anniversary Date	Owner
Apple Bay One	371775	8E2N	16	Sept. 16, 1999	Sept. 16, 2005	J. T. Shearer
Apple Bay Two	377240	5E4N	20	May 17, 2000	May 17, 2005	J. T. Shearer
Apple Bay Three	371777	4E2N	8	Sept. 18, 2000	Sept. 18, 2005	J. T. Shearer
Apple Bay Four	374744	4N4W	16	March 11, 2000	March 11, 2006	J. T. Shearer
Apple Bay Five	373854	3N4E	12	Dec. 5, 1999	Dec. 5, 2005	J. T. Shearer
Apple Bay 6	374738	2 post	1	March 9, 2000	March 9, 2004	R. W. Howich
Apple Bay 7	374739	2 post	1	March 9, 2000	March 9, 2004	R. W. Howich
Apple Bay 8	374740	2 post	1	March 9, 2000	March 9, 2004	R. W. Howich
Apple Bay 9	374741	2 post	1	March 9, 2000	March 9, 2004	R. W. Howich
Apple Bay 10	377359	2 post	Fr	May 16, 2000	May 16, 2004	R. W. Howich
Apple Bay 11	377360	2 post	Fr	May 16, 2000	May 16, 2004	R. W. Howich
Jody 1	377262	2 post	1	May 11, 2000	May 11, 2004	R. W. Howich
Jody 2	377263	2 post	1	May 11, 2000	May 11, 2004	R. W. Howich
		Total 80 units				

Note: Apple Bay 6-11 and Jody 1 & 2 have been legally surveyed and a Mining Lease is presently being applied (Lot 2323). Tenure number of future lease will be 379922.

Mineral title is acquired in British Columbia via the Mineral Act and regulations, which require approved assessment work to be filed each year in the amount of $100 per unit per year for the first three years and then $200 per unit per year thereafter to keep the claim in good standing.

Under the present status of mineral claims in British Columbia, the consideration of industrial minerals requires careful designation of the products end use. An industrial mineral is a rock or naturally occurring substance that can be mined and processed for its unique qualities and used for industrial purposes (as defined in the *Mineral Tenure Act*). It does not include "Quarry Resources". Quarry Resources includes earth, soil, marl, peat, sand and gravel, and rock, rip-rap and stone products that are used for construction purposes (as defined in the *Land Act*). Construction means the use of rock or other natural substances for roads, buildings, berms, breakwaters, runways, rip-rap and fills and includes crushed rock. Dimension stone means any rock or stone product that is cut or split on two or more sides, but does not include crushed rock.



PEMBERTON 1
229685
PEMBERTON 2
229686
PEMBERTON 3
229687
PEMBERTON HILLS
APPLE BAY FIVE
373854
APPLE BAY FOUR
374744
APPLE BAY TWO
377240
371777
APPLE BAY ONE
371773
APPLE #2
22984
APPLE #3
229843
Apple 1
Apple 4
AREA OF Associated Claims.
AREA OF MINING LEASE.
LCP
Norton Pt.
Henriksen Pt.
Straggling Islands
Wakalish Cr.
Nahwitti Creek
0 500 1000 METERS
1:31,680
HOMEGOLD RESOURCES LTD.
APPLE BAY PROJECT
CLAIM MAP
1:50,000
SCALE as 1:31,680
DATE Aug. 00
N.T.S. 92L/12E
WORK BY J. T. Shearer
FIGURE 4

5.0 GEOLOGY

The basement upon which the rocks of northern Vancouver Island were laid down is probably of Middle to Upper Paleozoic Age. At the time of deposition, the landmass, which now makes up Vancouver Island, was located in the equatorial regions of the Pacific Ocean. It consisted of felsic to basic volcanics deposited in a submarine environment. The very important copper-zinc-gold-silver ore bodies at Western Mines' Buttle Lake operations were developed within this sequence.

In Upper Triassic time (about 200 million years ago), these basement rocks were covered by a series of pillow lavas and flows largely of basaltic composition. Total thicknesses extruded probably exceed 2400 metres. These rocks are known today as the Karmutsen Formation.

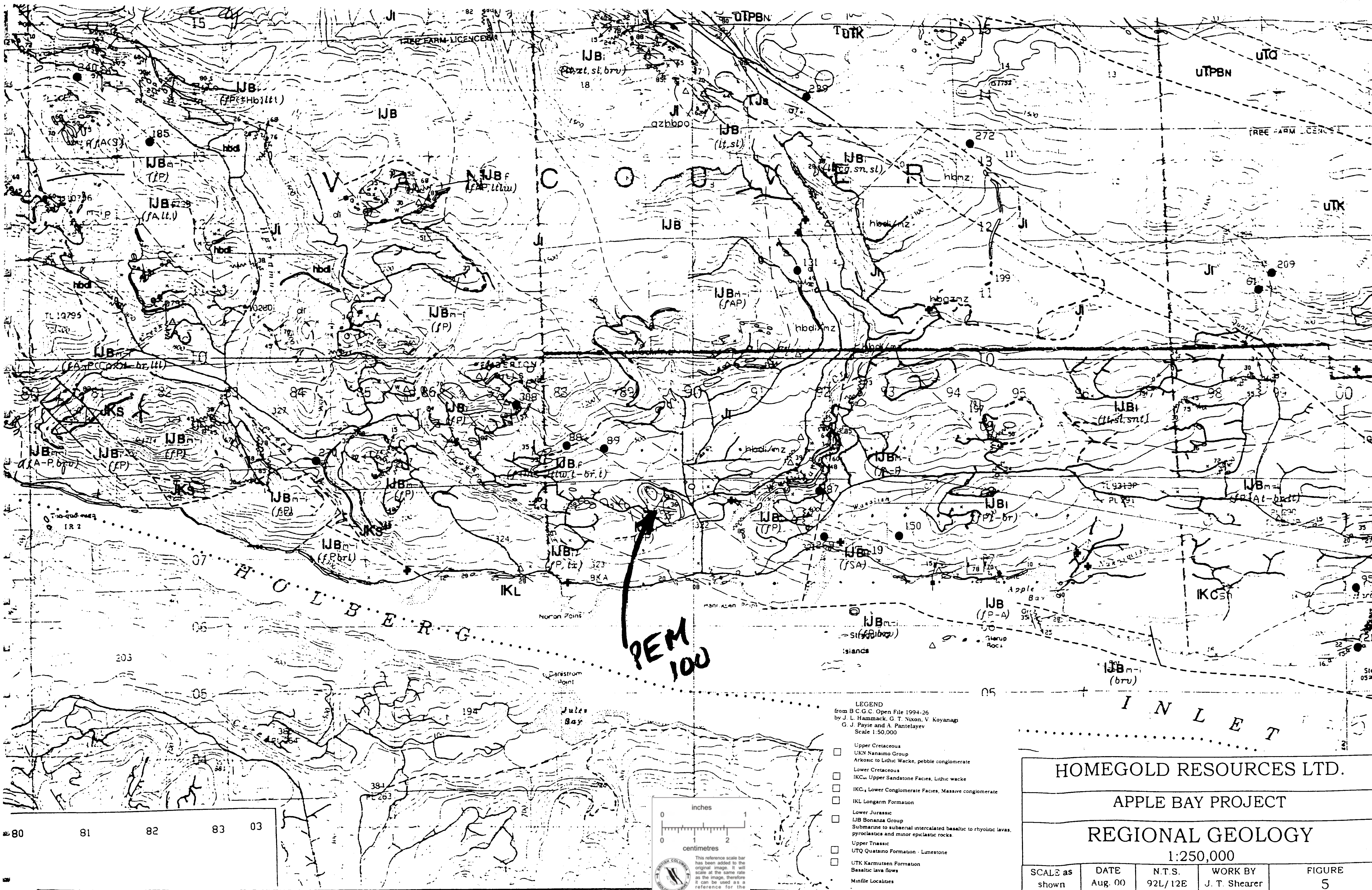
Following this period of basaltic volcanism, carbonate rocks (the Quatsino Limestone) accumulated to thicknesses of about 300 metres, although a much thinner section appears to be the rule north of Holberg Inlet. Of importance from an economic standpoint is the correlation between the Karmutsen – Quatsino section of Vancouver Island and the Nikolai Greenstone – Chitistone Limestone section of southeastern Alaska, both of which are part of the same Central Pacific terrane. The Nikolai, like the Karmutsen, is considerably enriched in copper as compared with the average basalt. The Chitistone Limestone was host to the very high-grade Kennecott Copper deposit, which was apparently derived by re-concentration of the much lower-grade copper disseminated through large volumes of Nikolai rock.

Above the Quatsino there is generally found a clastic section of which appears to be of slightly different age and of varying composition in different parts of northern Vancouver Island. Depending on age, composition and location, it is known as the Parson Bay Formation or the Harbledown Formation. The Parson Bay is somewhat calcareous and of upper-most Triassic age while the Harbledown is more argillitic and of lower-most Jurassic age. Above the sedimentary section are the Jurassic Bonanza Volcanics, an assemblage of flows, tuffs and fragmentals largely of andesitic composition, but with minor basaltic and rhyodacitic sections.

During and after eruption of the Bonanza Volcanics, granitic bodies were emplaced within the Karmutsen-Quatsino-Bonanza sequence. These bodies ranged in size from dykes and small plugs to masses of batholithic proportions. Some of these intrusives formed the underground reservoirs, which broke through to surface to deposit the Bonanza Volcanics.

Reaction between these very hot, high-level vent zones and circulating groundwater and seawater led to the development of numerous zones of highly altered rock, within or adjacent to which are copper-gold-molybdenum deposits. The alteration zones are generally characterized by the presence of large amounts of silica, clay minerals, pyrite, pyrophyllite and laumontite. Of the various alteration zones, perhaps 90% are located in the belt immediately north of Rupert and Holberg Inlets particularly in the vicinity of the PEM100 Quarry and Pemberton Hills, which are covered by the Apple Bay and Jody Claims.

At some time during the latter part of the Jurassic, following a long period of northward drift, the Vancouver Island – Queen Charlotte Islands – Southeast Alaska terrane, apparently somewhat fragmented, collided with and fused to the North American Continent. Following this accretion, and a general elevation of the landscape probably


V A N C O U V E R
H O L B E R G
I N L E T
TREE FARM LICENCE
Norton Point
Apple Bay
Jules Bay
Islands
PEM 100
LEGEND
from B.C.G.C. Open File 1994-26
by J. L. Hammack, G. T. Nixon, V. Koyanagi
G. J. Payie and A. Pantelayev
Scale 1:50,000
Upper Cretaceous
UKN Nanaimo Group
Arkosic to Lithic Wacke, pebble conglomerate
Lower Cretaceous
lKCsn Upper Sandstone Facies, Lithic wacke
lKCcg Lower Conglomerate Facies, Massive conglomerate
lKL Longarm Formation
Lower Jurassic
lJB Bonanza Group
Submarine to subaerial intercalated basaltic to rhyolitic lavas, pyroclastics and minor epiclastic rocks.
Upper Triassic
UTQ Quatsino Formation - Limestone
UTK Karmutsen Formation
Basaltic lava flows
Minfile Localities
inches
centimetres
This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.
HOMEGOLD RESOURCES LTD.
APPLE BAY PROJECT
REGIONAL GEOLOGY
1:250,000
SCALE as shown
DATE Aug. 00
N.T.S. 92L/12E
WORK BY J. T. Shearer
FIGURE 5

caused related to the mechanics of collision, highland portions of the terrane were eroded into basinal areas, forming continental transgressive sandstones of Cretaceous age, which included numerous coal measures, those of the Nanaimo basin being most notable. One of the small basins of sandstone extends from the western edge of the Island Copper Mill area to the vicinity of Apple Bay, which lies to the east of the claims. Since the deposition of these various sandstones, there has been minor volcanic and intrusive activity on the island.

Comprehensive geological mapping of Northern Vancouver Island was carried out during the late 1960's, the bulk of it by Dr. Jan Muller of the Geological Survey of Canada with major assistance by Dr. Kenneth Northcote of the B.C. Department of Mines. The results of their mapping are summarized on G.S.C. Map 1552A. More recently, mapping was carried out on map sheets NTS 97L/12 and 92L/11W by Hammock, J. L. et. al in the 1990's, Figure 4A. The results of this work, which was produced by the Geological Survey Branch of the British Columbia government is available in both digital and hard copy formats.

6.0 PROPERTY GEOLOGY and CHALKY GEYSERITE and KAOLINITE POTENTIAL

6.1 Geology

Geological mapping and diamond drilling, Figure 4B, on the Apple Bay Project indicates that the area extending northwest from the PEM100 Quarry to and including the Pemberton Hills is underlain by a series of large-scale extrusive rhyolite dome. These rhyolite domes are made up of both flow banded and coarse pyroclastic units containing differing Al_2O_3 contents. These units form steep bluffy knobs on the property and blocky talus fans occur at the base of the bluffs.

The introduction of intrusive granitic rocks into the Bonanza Volcanics created high level vent zones, which along with heated ground water, strongly altered the rhyolitic rocks with the introduction of silica and clay minerals. Late stage intense acid sulphide and advanced argillic alteration occurred throughout the entire system.

Geological mapping and drill core logging indicate that an intensely altered 20-35 metres thick section of rhyolite (identified as white chalky geyserite) overlies a unit of less altered rhyolitic breccia. the white chalky geyserite is of primary economic interest because of its silica and alumina content. The white chalky geyserite is made up of interbedded units of flow banded rhyolite and coarse pyroclastic (fragmented) rocks. These units are described below:

1) Flow Banded White Chalky Geyserite
   - Fine-grained matrix with weak to pronounced flow banding.
   - some flow folding is present as shown by convoluted bands.
   - flow banding often exhibits welded texture.
   - limonite staining is common and flow banded sections often appears to contain more kaolinite alteration than the more siliceous fragmented units.
   - occasionally flow top brecciation is observed.

2) Fragmental White Chalky Geyserite (Breccia)
   - often intensely silicified matrix with chalky clay (argillic) altered fragments.
   - More strongly silicified fragment appears to be found near flow-bonded units. Some fragments appear to be partially digested.
   - fragments can be >10 cm in diameter and can vary from rounded to angular in shape.
   - fragments sometimes appear to be flattened into elongated shapes.

The fragmented rhyolitic (breccia) that underlies the white chalky geyserite is described below:

1) Less Altered Fragmented Rhyolite
   - unit is medium green coloured.
   - fragments are fine grained, closely packed in a dark grey matrix
   - minor fine-grained pyrite along fractures possibly associated with some yellowish alunite alteration.
   - some fragments are kaolinized but are not bleached out.

Diamond drilling identified two areas that contained sufficient geological potential and grade projection to warrant a statistical analysis of reserves. This work is documented in Section and Plan maps and data tables prepared using computer smoothing techniques by Nilsson (2000). A summary of the geyserite potential is approximated by manual method as outlined below:

Area A (Surrounding PEM100 Quarry)
Drill holes 1 – 6, 9, 13 and 19 used
The thicknesses of geyserite in each hole were averaged to produce a minimum thickness of 25.06m.

Area B (150m NW of Area A)
Drill holes 15 and 17 used
The thicknesses of geyserite in each hole was averaged to produce a minimum thickness of 21.34m.

Using a specific gravity of 2.6 tonnes per cubic metre for geyserite, the potential of chalky geyserite is estimated to be:

Geological Potential: Area A 60,000 m^2 x 25.06m thickness x 2.6 tonne/m^3
= 4 million tonnes grading 83.66% SiO_2, 12.49% Al_2O_3 and 0.09% SO_3

Geological Potential: Area B 20,000 m^2 x 21.34m thickness x 2.6 tonne/m^3
= 1.11 million tonnes grading 81.89% SiO_2, 14.33% Al_2O_3 and 0.05% SO_3

The total Chalky Geyserite Geological Potential is:
5.02 million tonnes grading 83.26% SiO_2, 12.90% Al_2O_3 and 0.08% SO_3

The 150+ metre wide area between Area A and B requires more evaluation by drilling. this area is identified as Area C. Area C has the potential to contribute an additional 4.3 million tonnes to the chalky geyserite potential. An economic evaluation of this potential is recommended using as criteria the current price of a similar material from Sumas Mountain in Abbotsford. It appears that the barging in bulk from Port Hardy or Rupert Inlet is highly competitive with trucking from Sumas Mountain to Mission Loading Facility.

6.2 Diamond Drilling

A total of 24 diamond drillholes were completed on the property between late 1999 and March 2000. The holes are listed in Table II (page 8). The other 9 geyserite zones have not been drilled to date. Preliminary surface sampling suggests that the other zones have similar distribution of primary rock chemistry.

A typical sample of Chalky geyserite has the following trace elements:

TABLE II

Trace Element Content of Chalky Geyserite

Mo	Na%	Ni	P	Pb	S%	Sb	Sc	Sr	Ti%	Tl	U	V	W
2	<0.01	1	110	24	0.02	<2	<1	33	<0.01	<10	<10	3	<10

Zn	Ag	As	B	Ba	Be	Bi	Cd	Co	Cr	Cu	Ga	Hg	Mn
<2	0.2	6	<10	60	<0.5	<2	<0.5	<1	12	12	<10	<1	<5

ppm except where shown

Pem 100 Silica Quarry - Pit Development Areas

Scale 1:20000

FIGURE 4B

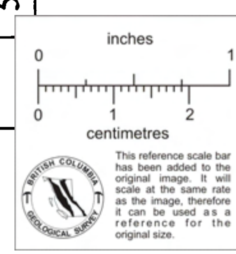


TABLE III

Diamond Drill Data

HOLE #	N.	E.	LENGTH	DIP	AZIMUTH	ELEVATION	REMARKS
ABBY-99-01	9506.30	7685.30	39.62 (130')	-90	000	115.00	Removed top 20 feet of drill hole in Bulk Sample 2
ABBY-99-02	9613.80	7731.40	45.72 (150')	-90	000	128.50	
ABBY-99-03	9589.10	7729.50	45.72 (150')	-90	000	129.50	in Bulk Sample 1
ABBY-99-04	9562.00	7723.00	45.72 (150')	-90	000	129.00	in Bulk Sample 1
ABBY-99-05	9601.40	7708.20	18.29 (60')	-90	000	118.20	First Bench
ABBY-99-06	9580.00	7700.00	18.29 (60')	-90	000	116.00	First Bench
ABBY-99-07	9164.30	7780.40	30.48 (100')	-90	000	111.20	West near 100C
ABBY-99-08	Lost in Overburden (19')						
ABBY-99-09	9511.10	7758.70	30.48 (100')	-90	000	127.20	on Road P100A
ABBY-99-10	9258.20	7745.90	29.77 (97')	-90	000	106.10	east of 7, west of site of 8
Subtotal 1,016 ft.							
ABBY-00-11	9457.0	8075.00	12.20 (40')	-90	000	176.76	In gouge
ABBY-00-12	9417.10	8034.70	15.55 (51')	-90	000	156.80	In gouge
ABBY-00-13	9601.50	7804.00	13.41 (60')	-90	000	140.00	Road 100A
ABBY-00-14	9654.00	7890.00	15.25(50')	-90	000	150.00	Road 100A
ABBY-00-15	9390.00	7974.00	12.20(75')	-90	000	168.00	
ABBY-00-16	9283.20	7964.20	30.79 (101')	-90	000	161.20	Upper drill road
ABBY-00-17	9415.5	7901.9	30.49 (100')	-90	000	157.50	
ABBY-00-18	9447.50	7846.80	30.79 (101')	-90	000	156.20	
ABBY-00-19	9526.0	7825.00	30.79 (101')	-90	000	159.70	
ABBY-00-20	9222.30	7991.30	30.49 (100')	-90	000	167.64	
ABBY-00-21	9161.20	8093.50	21.39 (75')	-90	000	182.88	
ABBY-00-22			30 (76')	-90	000	103.63	at km 52 sign on mainline
ABBY-00-23			30 (61')	-90	000	102.11	on road 100B
ABBY-00-24	9052.50	7710.60	40 (51')	-90	000	108.30	end of road 100C
Subtotal 1,042 ft							
Total Footage = 2,058 ft = 627.29m							

All drillholes have been completely assayed from the top of the hole to the bottom. Drill logging procedures, core splitting protocol and assaying have been reviewed and found to have been done to a high standard. Most of the assaying was done by the x-ray chemist at the Tilbury Cement Plant in Delta to exact cement industry standards. Check assays were completed with Chemex Labs.

7.0 PROJECT DESCRIPTION

7.1 Drilling

The proposed project includes a quarry with a mobile crushing plant with a capacity of 300 tonnes per hour, a stockpile area for crushed material, a loading conveyor and a truck loading facility.

7.2 Quarry Development

The deposit, as shown in Plan and Section (Figure 5A to Figure 5G and Figure 6A to Figure 6C at working scales of 1:1,000 and 1:2,000), including production tables was formulated by John Nilsson, P.Eng. Starting near the south boundary of Lot 2323 Mining Lease, the quarry will be worked in a series of 8 to 10 metre-wide benches with backwalls of about 8 metres and will be developed as required to accommodate elevation increasing by about 80 metres to produce a total of about 2,500,000 tonnes at 245,000 tonnes per year.

The removal of the minimal overburden, consisting of soil, sand, gravel and boulders, mainly in the southwest of the developing quarry, will be stored in a berm along the quarry edge. This may be utilized as filter beds for precipitation runoff and later in the reclamation of mined-out quarry areas.

Blast Design

Drilling and blasting is required prior to excavation at the quarry face. Contractor forces will be used for this quarry operation. Quarry blasting operations will be undertaken and supervised by qualified personnel. Practice to date has been to drill 3" holes, test mining on a 10m bench. The hole size may vary with time and contractor selection of equipment but in general the blasthole drills will be of the smaller, more moble quarry style percussion drills.

Blastholes will be loaded with ammonium nitrate and fuel oil when drill hole conditions are dry. Packaged explosives may be toe loaded in dry holes and used more extensively when drill hole conditions are wet. Blast initiation will be by non-electric methods and 16 per delay will be calculated.

The quarry area will be clearly posted and secured during blasting operations. Explosives magazines will be located according to the British Table of distances and moved during the course of quarry development as required. This quarry may be operated on a seasonal basis. Magazines will only be used for storage on site during periods of active quarry operations.

Haulage Roads

Quarry operations will be undertaken by contractor forces and equipment selection may vary over the life of the project. In general, the scale of the operation indicates that haulage trucks used in the pit may range from tandem axle dump trucks through articulated or rigid frame off road end dump units to 35 t capacity . Equipment is expected to be radio controlled to improve operating efficiency.

Haulage roads in and around the mine will be constructed in single lane or double lane configuration depending upon the circumstances and development logistics. When

Production Schedule Summary

TABLE IV

Year		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Total
Stage 1 Pit																						
Ore	(t x 1000)	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	181.2	-	-	-	-	-	-	-	-	-	-	2,386.2
Al2O3	%	10.63	10.28	12.33	12.44	13.49	14.38	15.27	15.99	16.70	17.69	-	-	-	-	-	-	-	-	-	-	13.82
SiO2	%	87.45	100.91	91.52	87.36	83.46	81.46	79.38	74.60	72.43	73.62	-	-	-	-	-	-	-	-	-	-	83.48
Fe3O4	%	1.04	1.17	1.27	1.76	2.03	2.25	2.44	2.50	2.51	2.10	-	-	-	-	-	-	-	-	-	-	1.90
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waste	(t x 1000)	84.5	49.0	51.4	44.1	41.6	39.6	39.3	41.4	21.8	4.8	-	-	-	-	-	-	-	-	-	-	417.6
Cumulative	(t x 1000)	84.5	133.5	184.8	228.9	270.6	310.2	349.5	391.0	412.8	417.6	417.6	417.6	417.6	417.6	417.6	417.6	417.6	417.6	417.6	417.6	
Waste	(bcm x 1000)	32.5	18.9	19.8	17.0	16.0	15.2	15.1	15.9	8.4	1.8	-	-	-	-	-	-	-	-	-	-	160.6
Cumulative	(bcm x 1000)	32.5	51.3	71.1	88.0	104.1	119.3	134.4	150.4	158.8	160.6	160.6	160.6	160.6	160.6	160.6	160.6	160.6	160.6	160.6	160.6	
Stage 2 Pit																						
Ore	(t x 1000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Al2O3	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SiO2	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fe3O4	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	g/t	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	g/t	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waste	(t x 1000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cumulative	(t x 1000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Waste	(bcm x 1000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cumulative	(bcm x 1000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Stage 3 Pit																						
Ore	(t x 1000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Al2O3	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SiO2	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Fe3O4	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	g/t	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	g/t	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waste	(t x 1000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cumulative	(t x 1000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Waste	(bcm x 1000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Cumulative	(bcm x 1000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Summary																						
Ore	(t x 1000)	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	245.0	181.2	-	-	-	-	-	-	-	-	-	-	2,386.2
Al2O3	%	10.63	10.28	12.33	12.44	13.49	14.38	15.27	15.99	16.70	17.69	-	-	-	-	-	-	-	-	-	-	13.82
SiO2	%	87.45	100.91	91.52	87.36	83.46	81.46	79.38	74.60	72.43	73.62	-	-	-	-	-	-	-	-	-	-	83.48
Fe3O4	%	1.04	1.17	1.27	1.76	2.03	2.25	2.44	2.50	2.51	2.10	-	-	-	-	-	-	-	-	-	-	1.90
-	g/t	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	g/t	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
-	%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Waste	(t x 1000)	84.5	49.0	51.4	44.1	41.6	39.6	39.3	41.4	21.8	4.8	-	-	-	-	-	-	-	-	-	-	417.6
Total	(t x 1000)	**329.5**	**294.0**	**296.4**	**289.1**	**286.6**	**284.6**	**284.3**	**286.4**	**266.8**	**186.0**	-	-	-	-	-	-	-	-	-	-	**2,803.8**

TABLE IV

DETAILED PRODUCTION SCHEDULE

Mining Schedule 245,000 tpa

TABLE V

Stage 1 Pit

	Ore									Year 1		Year 2		Year 3		Year 4		Year 5		Year 6		Year 7		Year 8		Year 9		Year 10		Year 11		Year 12		Year 13		Year 14		Year 15		Total	
Bench	tonnes	Al2O3	SiO2	Fe2O3				Waste tonnes	Total tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes
	(t x 1000)	%	%	%				(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)
215										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
210										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
195										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
190										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
185										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
180										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
175										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
170										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
165	0.2	9.96	83.66	2.30				-	0.2	0.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.20	-
160	0.3	7.32	86.54	2.09				0.1	0.4	0.30	0.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30	0.10
155	5.8	8.45	85.04	2.36				1.3	7.1	5.80	1.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.80	1.30
150	4.1	7.28	86.56	2.11				2.6	6.7	4.10	2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.10	2.60
145	2.6	6.89	86.73	2.69				14.2	16.8	2.60	14.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.60	14.20
140	0.1	-	-	-				10.3	10.4	0.10	10.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	10.30
135	14.2	6.69	89.83	1.77				26.5	40.7	14.20	26.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.20	26.50
130	21.6	7.85	89.93	1.21				13.7	35.3	21.60	13.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.60	13.70
125	207.7	11.42	87.16	0.88				16.7	224.4	196.10	15.8	11.60	0.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	207.70	16.70
120	212.0	10.01	102.61	1.17				43.6	255.6	-	-	212.00	43.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	212.00	43.60
115	280.0	12.33	91.52	1.27				58.7	338.7	-	-	21.40	4.5	245.00	51.4	13.60	2.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	280.00	58.70
110	296.9	12.45	87.11	1.79				52.9	349.8	-	-	-	-	-	-	231.40	41.2	65.50	11.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	296.90	52.90
105	322.2	13.87	82.12	2.12				53.8	376.0	-	-	-	-	-	-	-	-	179.50	30.0	142.70	23.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	322.20	53.80
100	291.8	15.10	80.54	2.43				45.1	336.9	-	-	-	-	-	-	-	-	-	-	102.30	15.8	189.50	29.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	291.80	45.10
95	255.5	15.86	75.38	2.49				46.2	301.7	-	-	-	-	-	-	-	-	-	-	-	-	55.50	10.0	200.00	36.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	255.50	46.20
90	191.4	16.54	71.14	2.51				22.4	213.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.00	5.3	146.40	17.1	-	-	-	-	-	-	-	-	-	-	-	-	191.40	22.40
85	129.8	16.93	74.36	2.52				6.2	136.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	98.60	4.7	31.20	1.5	-	-	-	-	-	-	-	-	-	-	129.80	6.20
80	90.7	17.54	74.25	1.91				2.5	93.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90.70	2.5	-	-	-	-	-	-	-	-	-	-	90.70	2.50
75	59.3	18.32	72.27	2.17				0.8	60.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	59.30	0.8	-	-	-	-	-	-	-	-	-	-	59.30	0.80
70										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50										-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	2,386.2	13.82	83.48	1.90	-	-	-	417.6	2,803.8	245.0	84.5	245.0	49.0	245.0	51.4	245.0	44.1	245.0	41.6	245.0	39.6	245.0	39.3	245.0	41.4	245.0	21.8	181.2	4.8	-	-	-	-	-	-	-	-	-	-	2,386.20	417.60

Stage 2 Pit

	Ore									Year 1		Year 2		Year 3		Year 4		Year 5		Year 6		Year 7		Year 8		Year 9		Year 10		Year 11		Year 12		Year 13		Year 14		Year 15		Total	
Bench	tonnes	Al2O3	SiO2	Fe2O3				Waste tonnes	Total tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes
	(t x 1000)	%	%	%				(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)
215									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
210									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
195									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
190									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
185									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
180									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
175	0.1	-	-	-				56.5	56.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
170	38.9	10.50	80.89	2.99				24.6	63.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
165	57.1	11.97	84.10	1.98				14.3	71.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160	49.7	14.74	94.51	1.72				16.2	65.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
155	61.9	13.99	89.16	1.39				10.2	72.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150	66.2	14.73	87.49	1.37				9.9	76.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
145	65.4	14.77	81.98	1.07				4.2	69.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
140	77.2	13.43	82.12	1.41				3.4	80.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
135	79.0	12.21	82.31	1.82				9.6	88.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
130	71.9	9.02	85.61	1.76				10.9	82.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
125	59.1	8.31	86.18	1.86				6.2	65.3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
120									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
115									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
85									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	626.5	12.41	85.25	1.68	-	-	-	166.0	792.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE V

TABLE VI

Stage 3 Pit

	Ore									Year 1		Year 2		Year 3		Year 4		Year 5		Year 6		Year 7		Year 8		Year 9		Year 10		Year 11		Year 12		Year 13		Year 14		Year 15		Total	
Bench	tonnes	Al2O3	SiO2	Fe2O3				Waste tonnes	Total tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes
	(t x 1000)	%	%	%				(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)
									-																																
215									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
210									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
195									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
190	0.1	-	-	-				0.1	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
185	0.1	-	-	-				1.3	1.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
180	0.1	-	-	-				4.3	4.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
175	0.1	-	-	-				8.3	8.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
170	0.1	-	-	-				12.4	12.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
165	4.4	7.67	80.43	4.87				10.8	15.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
160	13.5	8.37	80.01	4.78				3.9	17.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
155	18.1	10.50	78.33	4.69				0.6	18.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
150	20.7	11.14	80.23	3.60				0.2	20.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
145	20.7	10.62	83.88	2.26				-	20.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
140	18.1	10.64	84.42	2.00				0.3	18.4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
135	11.6	10.48	84.85	1.89				-	11.6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
130									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
125									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
120									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
115									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
110									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
105									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
95									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
85									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50									-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	107.6	10.24	81.42	3.25	-	-	-	42.2	149.8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Total

	Ore									Year 1		Year 2		Year 3		Year 4		Year 5		Year 6		Year 7		Year 8		Year 9		Year 10		Year 11		Year 12		Year 13		Year 14		Year 15		Total	
Bench	tonnes	Al2O3	SiO2	Fe2O3				Waste tonnes	Total tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes	Ore tonnes	Waste tonnes
	(t x 1000)	%	%	%				(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)	(t x 1000)
215	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
210	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
205	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
200	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
195	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
190	0.1	-	-	-	-	-	-	0.1		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
185	0.1	-	-	-	-	-	-	1.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
180	0.1	-	-	-	-	-	-	4.3		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
175	0.2	-	-	-	-	-	-	64.8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
170	39.0	10.47	80.68	2.98	-	-	-	37.0		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
165	61.7	11.65	83.84	2.19	-	-	-	25.1		0.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.20	-
160	63.5	13.35	91.39	2.37	-	-	-	20.2		0.30	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.30	0.10
155	85.8	12.88	86.60	2.15	-	-	-	12.1		5.80	1.30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	5.80	1.30
150	91.0	13.58	85.80	1.91	-	-	-	12.7		4.10	2.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	4.10	2.60
145	88.7	13.57	82.56	1.39	-	-	-	18.4		2.60	14.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.60	14.20
140	95.4	12.89	82.47	1.52	-	-	-	14.0		0.10	10.30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.10	10.30
135	104.8	11.27	83.61	1.82	-	-	-	36.1		14.20	26.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14.20	26.50
130	93.5	8.75	86.61	1.63	-	-	-	24.6		21.60	13.70	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21.60	13.70
125	266.8	10.73	86.94	1.09	-	-	-	22.9		196.10	15.77	11.60	0.93	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	207.70	16.70
120	212.0	10.01	102.61	1.17	-	-	-	43.6		-	-	212.00	43.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	212.00	43.60
115	280.0	12.33	91.52	1.27	-	-	-	58.7		-	-	21.40	4.49	245.00	51.36	13.60	2.85	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	280.00	58.70
110	296.9	12.45	87.11	1.79	-	-	-	52.9		-	-	-	-	-	-	231.40	41.23	65.50	11.67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	296.90	52.90
105	322.2	13.87	82.12	2.12	-	-	-	53.8		-	-	-	-	-	-	-	-	179.50	29.97	142.70	23.83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	322.20	53.80
100	291.8	15.10	80.54	2.43	-	-	-	45.1		-	-	-	-	-	-	-	-	-	-	102.30	15.81	189.50	29.29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	291.80	45.10
95	255.5	15.86	75.38	2.49	-	-	-	46.2		-	-	-	-	-	-	-	-	-	-	-	-	55.50	10.04	200.00	36.16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	255.50	46.20
90	191.4	16.54	71.14	2.51	-	-	-	22.4		-	-	-	-	-	-	-	-	-	-	-	-	-	-	45.00	5.27	146.40	17.13	-	-	-	-	-	-	-	-	-	-	-	-	191.40	22.40
85	129.8	16.93	74.36	2.52	-	-	-	6.2		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	98.60	4.71	31.20	1.49	-	-	-	-	-	-	-	-	-	-	129.80	6.20
80	90.7	17.54	74.25	1.91	-	-	-	2.5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	90.70	2.50	-	-	-	-	-	-	-	-	-	-	90.70	2.50
75	59.3	18.32	72.27	2.17	-	-	-	0.8		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	59.30	0.80	-	-	-	-	-	-	-	-	-	-	59.30	0.80
70	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	3,120.3	13.41	83.76	1.90	-	-	-	625.8	-	245.0	84.5	245.0	49.0	245.0	51.4	245.0	44.1	245.0	41.6	245.0	39.6	245.0	39.3	245.0	41.4	245.0	21.8	181.2	4.8	-	-	-	-	-	-	-	-	-	-	2,386.20	417.60

TABLE VI

roads are built to two way traffic standards, the running surface will be 3 times the width of the larges truck operating at that time. Allowance will be made for ditches and berms. Berms will be at least half the height of the tires of the largest machine operating on the road. Maximum operating road grades will be 10% or as dictated by the gracing capacity of a fully loaded haulage truck.

When roads are built for single lane operation, running surfaces on these roads will be built to two times the width of the largest truck. Allowance will be made for ditches and berms. Clearly marked pull-outs will be provided, quarry access will be restricted and vehicles will be radio controlled.

Runaway lanes will be provided as necessary on road sections with continuous negative grade.

The initial configuration of the quarry during 2000 used the following equipment:

7.3 Crushing Plant

The material was primary crushed through a Hewitt-Robbins 24x36 jaw crusher being fed by a Cat 980C wheel loader. This reduced the material to approximately 150mm size (minus 6").

7.4 Conveyor System

The loading of the 19mm material was accomplished by feeding through a 12 cubic metre surge bin, then onto a 15 metre conveyor, which feeds the 30 metre stacker, which deposits the material into the trucks or stockpile.

7.5 Stockpile

A stockpile capable of holding up to 50,000 tonnes of crushed material ready for trucking was required. The pile will cover approximately 5,000 to 7,000 square metres and reach a height of 10-12 metres. The stockpile will be located adjacent to the crushing facility.

7.6 Trucking Facilities

The trucks and transfer trailers will be loaded from the stockpile by mobile rubber-tired loader.

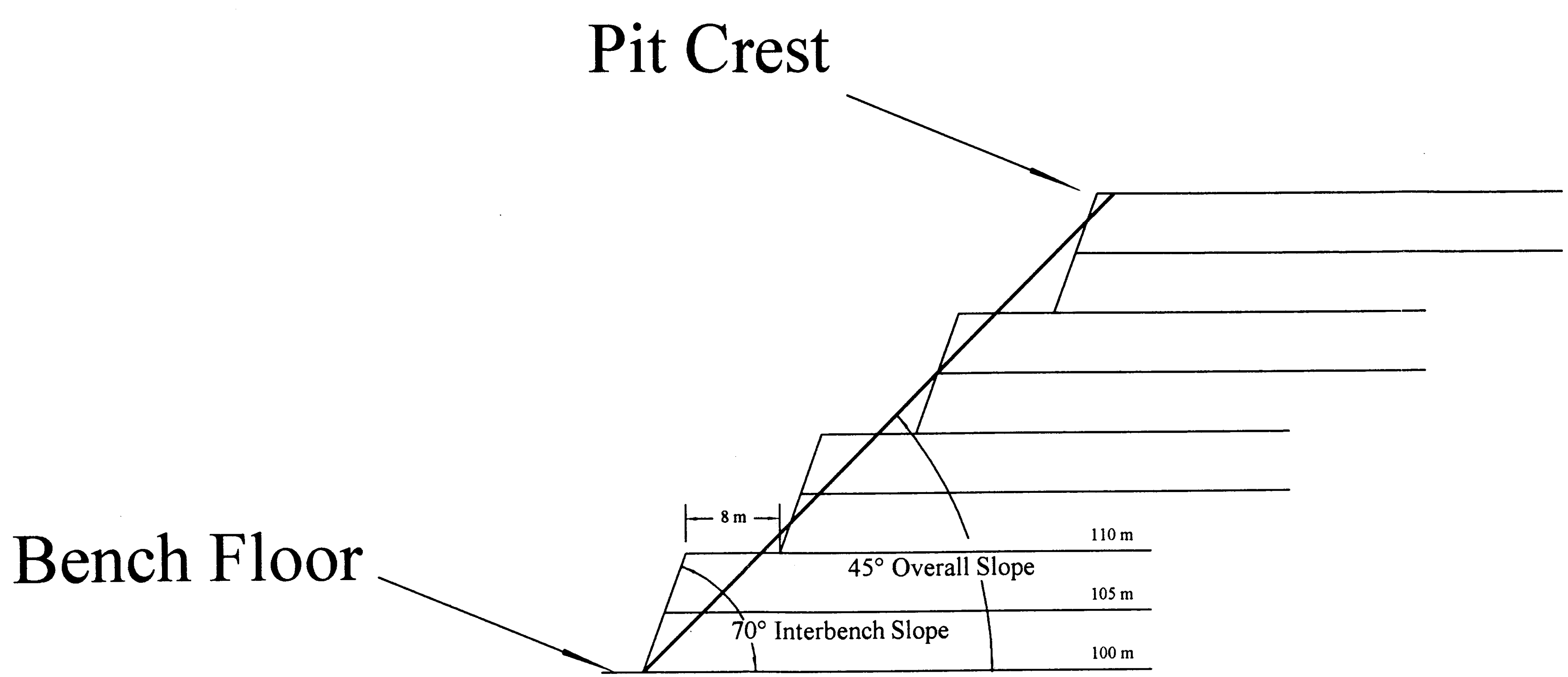
7.7 Barge Facilities

Barging will be through a new dock structure and existing stacking conveyor near Jensen Cove in Port Hardy. A proposal has been designed by P. Steffens, P. Eng. Future developments may use the ship loader at the old Island Copper site on Rupert Island.

7.8 Reclamation

The quarry will be progressively reclaimed, as outlined in Section 8.4, as the mining area advances and sufficient ground is made available for reseeding to forest values.

CONCEPTUAL DESIGN WALL SLOPE SECTION



Overall Slope is a function of wall height. Design for 10 m bench and 8 m berm

FIGURE 6C

7.9 Settling Ponds

Settling ponds are shown on Figure 5A to Figure 5G with associated ditch works and tables outlining production schedules.

7.10 Security

Locked gates will restrict access to the quarry site both from the south and west. Proper signage will be put in place and a well marked security fence will restrict access to active parts of the operation such as blasting faces and active waste dumps. A protocol will be formulated with Western Forest Products personnel to allow access to the forest harvesting areas to the west of the quarry.

8.0 ENVIRONMENTAL CONSIDERATIONS

8.1 Existing Conditions

The project, because of its proximity to Wann Knobs and Wanakana Creek riparian environment required careful planning to minimize impacts.

The area is within the Tree Farm Licence 6 held by Western Forest Products Ltd. and has been extensively logged in the recent past. The largest nearby logging centre is located at Port McNeill. Other land uses include hunting, native food, with sports and commercial fishing in nearby Holberg Inlet.

The quarry site is located within the Coastal Hemlock-Douglas Fir-Cedar biogeoclimatic zone. The area receives on the order of over 150+ cm of precipitation per year. The site is at an elevation of 100 to 250 metres ASL. The on-site upland vegetation is mixed Cedar, Fir and Hemlock forest, which is somewhat scrubby due to the presence of rock outcrops. No evidence of wildlife licks or trails has been observed, although bears and deer have been seen on the property during exploration work. Two small drainages convey runoff north from the area. These two appear to dry periodically. The ground slopes away to Wanakana Creek on the east, Holberg Inlet on the south and Youghpan Creek to the west.

The broader area of the Wanakana Creek watershed has been altered from its natural state through activities related to intensive forestry. In particular, the occurrence of logjams has cut off access to various areas of fish habitat.

8.2 Environmental Impacts and Planned Mitigation

The rock (chalky geyserite) to be quarried is relatively pure and chemically inert. The main knoll will be quarried leaving either level ground or a quarry, which extends down from the ridge crest to avoid the vertical cliffs on the north side of the knoll. The total area to be affected by the quarry, stockpile and loading facilities will be about 8 hectares by the end of the 30 year mine life.

The overburden consists of a thin layer of topsoil, which can be set aside and used as filter for quarry runoff until reclamation. The chalky geyserite, with the exception of a few minor fault areas is fairly pure and the entire amount of quarried material will be shipped out. A very minor amount of material in the fault/fold hinge areas is softer and somewhat mineralized and may not be useable. Thus, some minor waste material could be expected. This material can be used to form a base for the stockpile or returned to the pit.

Most of the stockpile may be located above the 100m elevation. Drainage from the quarry and from the stockpile will be directed into a major settling pond. Some filtration through overburden material or settling in a reservoir used for dust control is possible.

The minor silica content is mainly in the form of inert silica, and thus is not expected to be crystalline in nature. The Workers' Compensation Board requires that workers who may be exposed to more than 51% crystalline silica dust above the regulated limits must wear suitable respiratory protection. Subject to air-bourne dust sampling, in most instances properly fit tested on-half face respirators with High Efficiency Particulate Arrestor (HEPA) cartridges and disposable coveralls will be acceptable. Workers will be trained in the proper use of the respirators if required as well as the nature of the hazard to comply with Federal WHMIS Regulations. Homegold Resources Ltd. is committed to putting in place suitable controls to minimize the effects of dust generation, if necessary.

Quarrying, crushing, stockpiling, and loading of the crushed rock are all physical activities. Water spray will be used to control dust if necessary, in which case; some or all of the quarry drainage will be contained to provide a water source. All further processing will be off site.

Reasonable efforts to minimize the visual impact of the project, particularly from the west along Holberg Inlet, will be made. A screen of vegetation will be preserved wherever possible. Because the material is formed along a knoll, quarrying can be conducted either from the top down or back to front and this will be done subject to practical and economic constraints. The knoll formation also means that rock faces remaining at the end of the project will be low profile and easily screened by vegetation. A conveyor will be required for loading and some clearing and levelling of the immediate loading area will be required.

As a result of the small scale of the project and the relatively benign nature of the environmental impacts, the anticipated environmental concerns from this project are relatively minor, Figure 6B.

8.3 Fisheries Concerns

The Wanakana Creek supports anadromous stocks of sockeye, pink, chum, coho, chinook and steelhead as well as stocks of rainbow trout, Dolly varden and other non-sports fish. In addition to their contribution to commercial and native fisheries, these stocks form the basis of an important recreational fishery in the province.

Careful management of site drainage, removal of vegetation and overburden to prevent downslope impacts, particularly the introduction of silt laden water to any of the three watercourses will be undertaken. Because the site is located at the top of a hill site drainage concerns are limited to the precipitation falling on the site only. Overflow from the settling ponds will not exceed 75mg/1TSS.

As mentioned above, there are very significant fisheries resources in the vicinity. Due, however, to the location of the site on a hilltop and the nature of the material to be quarried, there should not be any impacts provided the site drainage is managed to prevent siltation problems. No treatment of site runoff is planned other than settling ponds and filtration required to address this issue.

The actual quarry will cover an area of 15.2 hectares and the vegetation and overburden will be removed from this area sequentially over the life of the quarry. Reclamation will be conducted on disused areas of the quarry using overburden, which has been stockpiled, or from areas which are to be opened. Replanting will be done using native plants, again from on site areas where possible.

Existing roads and infrastructure are available for this project, thus, physical impacts are limited to the area of the quarry. The hilltop location east of the vertical cliff face eliminates any visual impacts of the project and simplifies final reclamation.

In consultation with Lloyd Erickson of the Ministry of Environment Lands and Parks (MELP), he did not seem overly concerned about the project and advised that it would be appropriate to ignore water treatment for now as the background low pH and high dissolved aluminum and iron are common in the North Island Region. Once he had the project referred to him, he would advise if the Ministry wished to see a water treatment program.

It is important to minimize runoff water entering the quarry and to collect the remaining water into some type of settling pond and then to redistribute the water to ground. This would allow sampling and prevent accidental discharge of sediment-laden water to one of the streams.

8.4 Reclamation

At the end of the lifespan of this quarry it is expected that the Phase I Pit will be backfilled by waste material from Pit 2 and 3. Reclamation of the area is outline below.

Haul roads will be removed or scarified. This revegetation will be done in close consultation with Western Forest Products, who hold Tree Farm License 6.

The level surfaces, once covered in overburden and seeded could form the basis for continued forestry use.

In the event that the quarry is shut down before it extends to the 100m level, it would be graded and sloped with the overburden material remaining on site and reseeded. The stockpile base will be graded back down to the former level in order to re-establish forest habitat, Figure 6B.

8.5 Acid Rock Drainage

A review of the possibilities that would initiate acid rock drainage production in the Apple Bay Chalky Geyserite Quarry in the PEM-100 area were examined and is considered improbable that such a situation would develop either during or after the life of the quarry.

Acid production occurs when available oxidizable sulphur mineral species are exposed to air, water and certain bacteria to become decomposed into component molecular compounds, which include the formation of soluble compounds of a pH less than 7. The availability of the mineral species, their distribution and acid-generating potential in the natural environment is determined by examining the mineralogy of the material that is available for the oxidizing process.

The Apple Bay Chalky Geyserite Quarry is comprised of Material grading between 80% and 100% silicon dioxide (SiO_2), an inert mineral species at ambient temperature and pressures. The remaining mineral species include varying proportions of the following:

a) Kaolinite
b) Sericite
c) Alunite

All mineral species determined have no acid-generating potential.

The mining plan presents two features that negate acid generation:

1. All quarried material will be shipped to a processing plant located in Greater Vancouver. No quarried material will remain in the mined area, which implies that there is only the rock exposed at the different bench levels available for which acid generation is possible.

2. The quarry, at the end of its life, will be re-vegetated with commercial species of trees. This will negate any acid generation for all rock exposed within the quarry.

Three representative samples of quarry material were collected an analyzed for a series of variable that determine the potential of the rock for acid generation (refer to certificate A9935919 by Chemex Labs Ltd.). As can be seen from the results, the highest percentage of sulphur (including sulphate) is 0.13%, 0.07 and 0.04 for each sample which, when taken to stoichiometric for all sulphur that could be put into solution as acid, is determined to be approximately +1. This number may be high, as the percentage of sulphate (alunite) has not been measured (sulphate sulphur will not generate acid) and deducted form total sulphur.

The neutralization potential (a back titration analytical procedure which measures carbonate content - an acid neutralizer) is 1 average for the samples.

From the previous calculations, it is found that the net neutralization potential is -6. The ratio of neutralization potential to maximum potential acid is 0.00. This measurement indicated in conjunction with the net neutralization potential (NP - MPA-NNP) lies well outside any range of concern and the measurements are of little significance for acid generation.

The past pH of the rock is mildly acidic with a total percent sulphur well below the 0.13 range; there is no acid generation presently ongoing in the PEM-100 quarry.

The analytical results confirm field observations. Both water samples and sediments of the area show neither abnormal pH levels nor the production of ferric salts (a ubiquitous product of acid generation).

The material proposed to be quarried is deemed by both analytical and field observations to be benign in the potential for acid generation. The removal of all quarried material and the replanting of the quarry at the end of the mine life negate any potential of future (albeit unlikely) acid generation.

There is however acid rock drainage happening west and north as documented by Koyanagy & Panteleyev, "Natural Rock-Drainage in the Red Dog-Hushamu-Pemberton Hills Area, Northern Vancouver Island. Geological Fieldwork 1993, Paper 1994-1, B.C. Geological Survey Branch, but this is entirely a natural phenomenon.

Detail Drill Logs are available to substantiate the geological summary outlined in this note. If there are any questions, please contact the undersigned.

9.0 FUTURE PLANS for 2001

Based on experience gained during the pioneering work in 2000 producing 10,000 tonne bulk sample of initial product, the following proposal is envisaged to produce at least 100,000 tonnes in as shown on the Mine Plans.

1) Limited pioneering on bench level 100m and bench level 110m (immediately above the existing 100m bench established by the Forest Company), continuing south past the partially stripped area prepared in 2000. This will require some minor stripping and moving of overburden.
2) Move jaw crusher to the 100m bench (eliminating Truck tramming of muck). Pit run material can then be trammed the short distance by bulldozer or rubber tired loader to the jaw crusher.
3) Convey the 6" minus crush (and screened, if required) to the existing stockpile area, a horizontal distance of 50m and use a radial stacker or:
4) extend the haul road to the southern limit of the chalky geyserite exposure for ease of access to the 100m bench (which gives the option for the truck and transfers to load at the crusher site as well as the present stockpile area).
5) The jaw crusher should be increased to the 36"x48" size. Perhaps this mobile jaw crusher could be co-ordinated with the plans to open the Port Hardy Shale Pit quarry.
6) The drill pattern will remain at 9'x9' using a 3" hole diameter by Airtrac. Once a wide bench is established in the future, a larger production drill rig delivering a large diameter hole can be employed. The holes will be bottom primed and filled with Anfo. The relatively small wet areas will be carefully monitored and all stick powder used if required.
7) The bench height may be slightly less than 40 feet (8m) since the main machine moving muck is a Samsung 350-2 tracked excavator with a reach of 37.5 feet.

10.0 CONCLUSIONS and RECOMMENDATIONS

Acquisition and preliminary evaluation of the PEM100 Chalky Geyserite and Kaolinite Quarry was undertaken in October 1999 for Homegold Resources. The alumina and silica resource at PEM100 is a source for the raw material requirements of the cement plant operated by Tilbury Cement in Delta, B.C. A 25-35 metre thick Lower Jurassic sequence of intensely silicified and clay altered rhyolite flows and pyroclastic units of the Bonanza Group outcrop along a 320° trend for more than 800 metres from the PEM100 Quarry towards the Pemberton Hills.

Two main sub areas of chalky geyserite have been outlined by drilling to date on the PEM100 zone. Area A covers a 60,000m^2 area around the PEM100 quarry. This 27.77m thick zone contains a geological potential of about 4 million tonnes of geyserite grading approximately 83.66% SiO_2, 12.49% Al_2O_3 and 0.09% SO_3. Area B is located approximately 150 metres northwest of Area A and it covers a 20,000m^2 area in a saddle between to Wann Knobs. The 21.34m thick Area B zone contains a geological potential of about 1.11 million tonnes of material grading approximately 81.84% SiO_2, 14.33% Al_2O_3 and 0.05% SO_3. The total geological potential of both Area A and B is about 5 million tonnes grading 83.26% SiO_2, 12.90% Al_2O_3 and 0.08% SO_3.

An area of approximately 15.2 hectares will be required to be cleared for the initial quarry development. Environmental impacts are expected to be minimal. Several options for reclamation are proposed. The initial open cut of about 2.5 million tonnes is expected to be sufficient for the cement plant's requirements for about 10 years.

Approximately 9400 tonnes of chalky geyserite were drilled and blasted in 2000 on the initial pioneer bench at 100m elevation. This material was barged to the cement plant for an industrial trial. The results are ongoing.

Plans for 2001 propose pioneering a second bench level between 100m and 124m elevation toward the north with a 36"x42" jaw crusher on the 100m bench established in 2000. Detail plans are included in this report.

Respectfully submitted,

J. T. Shearer, M.Sc., P.Geo.
Quarry Supervisor #98-3550
Consulting Geologist
November 15, 2000

11.0 REFERENCES

Ascencios, A., 1973:
Expo Group, B.C. Department of Mines Assessment Report #4754.

Bristow, C. M., 1987:
World Kaolins: Genesis, Exploration and Application Industrial Minerals, July 1987, pp 45-59.

Cargill, D. G., Lamb, J., Young, M. J. and Rugg, E. S., 1976:
Island Copper. In C.I.M. Special Volume 15, Porphyry deposits of the Canadian Cordillera, pp. 206-218.

Clouthier, G., 1971:
Expo Group, B.C. Department of Mines Annual Report #3402.

Hammack, J. L., Nixon, G. T., Koyan, V., Payie, G. J., Panteleyev, A., Massey, N. W. D., Hamilton, J. V. and Haggard J. W., 1994:
Preliminary Geology of the Quatsino-Port McNeill Area, Northern Vancouver Island. Open File 1994-26, Geological Survey Branch, B.C. Department of Mines.

Muller, J. E., Northcote, K. E., and Carlisle, D., 1974:
Geology and Mineral Deposits of Alert Bay-Cape Scott Map Area, Vancouver Island, B.C. G.S.C. Paper 74-8.

Nilsson, J., 2000:
PEM100 Preliminary Plans and Sections.

2000:
PEM100 Statistical Calculations for Reserve Estimations to Accompany PEM100 Preliminary Plans and Sections.

Northcote, K. E., 1969:
Geology of the Port Hardy-Coal Harbour Area, B.C. Department of Mines Annual Report on Lode Metals, 1968, pp. 84-87.

1971:
Rupert Inlet-Cape Scott Map Area, B.C. Department of Mines Geology, Exploration and Mining, 1970, pp. 254-278.

Pearson, B. D., 1983:
Geology, Petrography, Silt and Rock Geochemistry, Wand Claims, Coal Harbour Area, Northern Vancouver Island, B.C. Department of Mines Assessment Report,

Shearer, J. T., 2000:
Prospectus (Summary Report) on the Apple Bay Project, Holberg Inlet Area, Wanokana Creek, Vancouver Island, August 29, 2000.

Wright, B., 2000:
Preliminary Environmental Assessment of a Proposed Quarry at Apple Bay on Holberg Inlet, B.C., Wright, B., July 28, 2000

Wright, B., 2000:
Addendum to: Preliminary Environmental Assessment of a Proposed Quarry at Apple Bay on Holberg Inlet, B.C., Wright, B., July 28, 2000

Young, M., 1969:
Expo Group, B.C. Department of Mines Annual Report #2190.

APPENDIX I

STATEMENT of QUALIFICATIONS

J. T. Shearer, M.Sc., P.Geo.

November 15, 2000

Appendix I

STATEMENT OF QUALIFICATIONS

I, JOHAN T. SHEARER, of 1817 Greenmount Avenue, in the City of Port Coquitlam, in the Province of British Columbia, do hereby certify:

1. I am a graduate of the University of British Columbia (B.Sc., 1973) in Honours Geology, and the University of London, Imperial College (M.Sc., 1977).
2. I have over 25 years experience in exploration for base and precious metals and industrial mineral commodities in the Cordillera of Western North America with such companies as McIntyre Mines Ltd., J.C. Stephen Explorations Ltd., Carolin Mines Ltd. and TRM Engineering Ltd.
3. I am a fellow in good standing of the Geological Association of Canada (Fellow No. F439) and I am a member in good standing with the Association of Professional Engineers and Geoscientists of British Columbia (Member No. 19,279).
4. I am an independent consulting geologist employed since December 1986 by Homegold Resources Ltd. at #5-2330 Tyner St., Port Coquitlam, B.C.
5. I am the author of a report entitled "Mine Plan for the Apple Bay Project (PEM100 Chalky Geyserite Quarry Holberg Inlet Area, Wanokana Creek Vancouver Island" dated November 15, 2000.
6. I have visited the property in September 1999, October 12, November 30 – December 15, 1999, and throughout 2000 while development and bulk sampling occurred. I have carried out mapping and sample collection and am familiar with the regional geology and geology of nearby properties. I have become familiar with the previous work conducted on the Apple Bay claims by examining in detail the available reports and maps and have discussed previous work with persons knowledgeable of the area.
7. I have worked closely with John Nilsson, P.Eng. to formulate the Mine Plan schedules and B. Wright, P. Biologist for environmental data.
8. I have an Open Pit Supervisor Ticket (#98-3550) for daily supervision duties in the Geyserite Quarry.
9. I own interest in the Apple Bay Claims and own Homegold Resources Ltd.

Dated at Port Coquitlam, British Columbia, this 15th day of November, 2000.

J.T. Shearer, M.Sc., F.G.A.C., P.Geo.
Quarry Supervisor
November 15, 2000