

GEOLOGICAL AND TRENCHING REPORT
ON THE
SERPENTINE PROJECT
(DIMENSION STONE MARKET)
SERPENTINE 1 AND SERPENTINE 2 GROUPS
Coquihalla Area, British Columbia
Latitude 49° 29' N / Longitude 121° 15' W
N.T.S. 92H/6, 11
New Westminster Mining Division

for

SUN OF HEAVEN ENTERPRISES LTD. (51%)
GOLDEN EAGLE MARKETING SYSTEMS LTD. (49%)
Suite 123 - 104 Avenue
Surrey, B.C. V3T 1W4
(Owners)

by

J.T. SHEARER, M.Sc., F.G.A.C.
NEW GLOBAL RESOURCES LTD.
548 Beatty Street
Vancouver, B.C.
V6B 2L3

July 10, 1991
Vancouver, B.C.

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**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

21,545

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SUMMARY

Extensive trenching and limited production from a bedrock jade occurrence in the Coquihalla Valley was completed between January 14 and June 11, 1991. Associated serpentinite, talc, soapstone and white rock alteration zones were also investigated and representative samples quarried. Significant amounts of Jade and other materials were cut and polished to demonstrate gem qualities. The claims, totalling 135 units, are owned or under option by Sun of Heaven Enterprises Ltd. and Golden Eagle Marketing Systems Ltd. and were acquired to cover zones of serpentine suitable for the manufacturing of decorative tiles or for the general dimension stone market. The Jade King nephrite deposit is included in the project area.

Previous owners have investigated the Serpentine Belt for lode-gold occurrences, nickel-cobalt mineralization, jade, talc and building slate. A general geological description of the property is contained in "Preliminary Geological Report on the Serpentine Project" by J.T. Shearer, dated December 28, 1990, 24 pages in length.

The claims are underlain by an altered and variably sheared ultramafic complex consisting mainly of irregular masses of serpentinite and gabbro. The Hozameen Fault, which incorporates the Coquihalla serpentine belt, separates two distinct crustal units. West of the fault is the Permian to Jurassic Hozameen Group which represents a dismembered ophiolite (or oceanic floor assemblage). East of the fault are Jurassic to Eocene sediments of the Methow-Pasayten trough. The trough is unconformably underlain by the Spider Peak Formation volcanics of Triassic age.

The serpentinite component has acted as the locus for intense shearing. Slickenside structures are abundant throughout the complex. The gabbro at an early stage was mainly in the form of dykes and sills. During emplacement of the ultramafic complex along the Hozameen Fault, the more brittle nature of the gabbro caused it to break up into mega-boudins.

The Dewdney Creek Highway Quarry is located immediately west of the East Hozameen Fault. The quarry appears to have had a fairly long history. It is shown on mid-1970's maps. However, the main period of activity occurred during the

construction of the Coquihalla Highway in 1984-1986, and during November 1990 to January 1991 when a large quantity of relatively coarse serpentine blocks were produced for armouring the highway and approach roads due to flood damage which happened in November 1990. A large gravel pit is located immediately east of the rock quarry.

The Dewdney Creek Quarry has exposed a 100 meter wide band of serpentine near the northeast corner of the claims. Tonnage estimates as documented in this report using cross sectional areas 30 metres apart give a total of ~~165~~ 165,000 tons of serpentine as having been removed for highway purposes. A minor portion of this tonnage is still within the pit area as sorted oversize, broken muck and screened material.

Blasting has also caused some micro-fracturing in the quarry walls and would require removal by proper dimension stone quarrying techniques before unfractured stone was exposed for large scale tiling applications. Mineral Title considerations of the serpentine resource are briefly considered, but the legal ramifications are outside the terms of reference of this report and have been left with the legal counsel for Golden Eagle - Sun of Heaven joint venture.

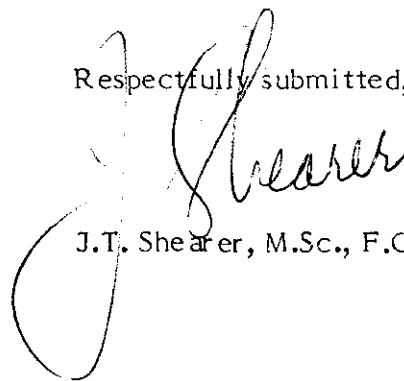
Production and trenching at the Jade Quarry progressed in several discrete stages.

- (a) An initial Phase I trenching and sawing program to expose the jade seam and quantify volumes and associated material.
- (b) A Phase II program to further expose the jade resource and continue to cut and polish representative specimens.

The jade seam is entirely contained along the West Hozameen Fault at the contact between sheared serpentinite and altered ribbon chert. Jade occurs as a thin layer immediately west of a much wider soapstone zone. Occasionally the jade layer thickens to produce pods up to 3 feet thick. The jade is typically dark green in colour with a lively lighter green mottling. Fracture intensity appears to vary considerably. The soapstone is usually dark green and commonly variegated with

interesting patterns. Preliminary estimates of easily available tonnage are presented. Large quantities of slickensided serpentinite and also more solid carveable serpentinite are available on the claims and adjacent areas.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "J.T. Shearer". The signature is written in dark ink and is positioned above the typed name.

J.T. Shearer, M.Sc., F.G.A.C.

INTRODUCTION

This report documents, for assessment purposes, the work program completed between January 14 and June 11, 1991 on the Serpentine Groups of claims. The Serpentine Group claims were located between May and July, 1990. On November 29, 1990, the Jade King claims were optioned. A budget of \$10,000 was set November 28, 1990 to initiate trenching on the Jade King to assess the potential of the jade and soapstone resource.

A review of the project concepts, geological database and potential for defining suitable serpentine for the dimension stone market and availability of good quality nephrite is contained in a report entitled "**Preliminary Geological Report on the Serpentine Project**" by J.T. Shearer, dated December 28, 1990, 24 pages in length.

Recent increases in the demand for dimension stone has been mainly in thin slab veneers and tiles used for flooring and decorative wall facings (Page, 1989). Developments in automated fabricating facilities have allowed stone slabs to be produced at prices competitive with many other building materials. Presently, all major British Columbia dimension stone projects are using imported materials.

An additional \$30,000 budget was formulated on February 5, 1991 with the objective of identifying 100 tons of soapstone, 100-150 tons of serpentine for decorative gravel, 100 tons of carving serpentinite and jade as available.

Local skilled contractors in Hope and Chilliwack provide a ready source of heavy equipment such as loaders, hoes, bulldozers and trucks.

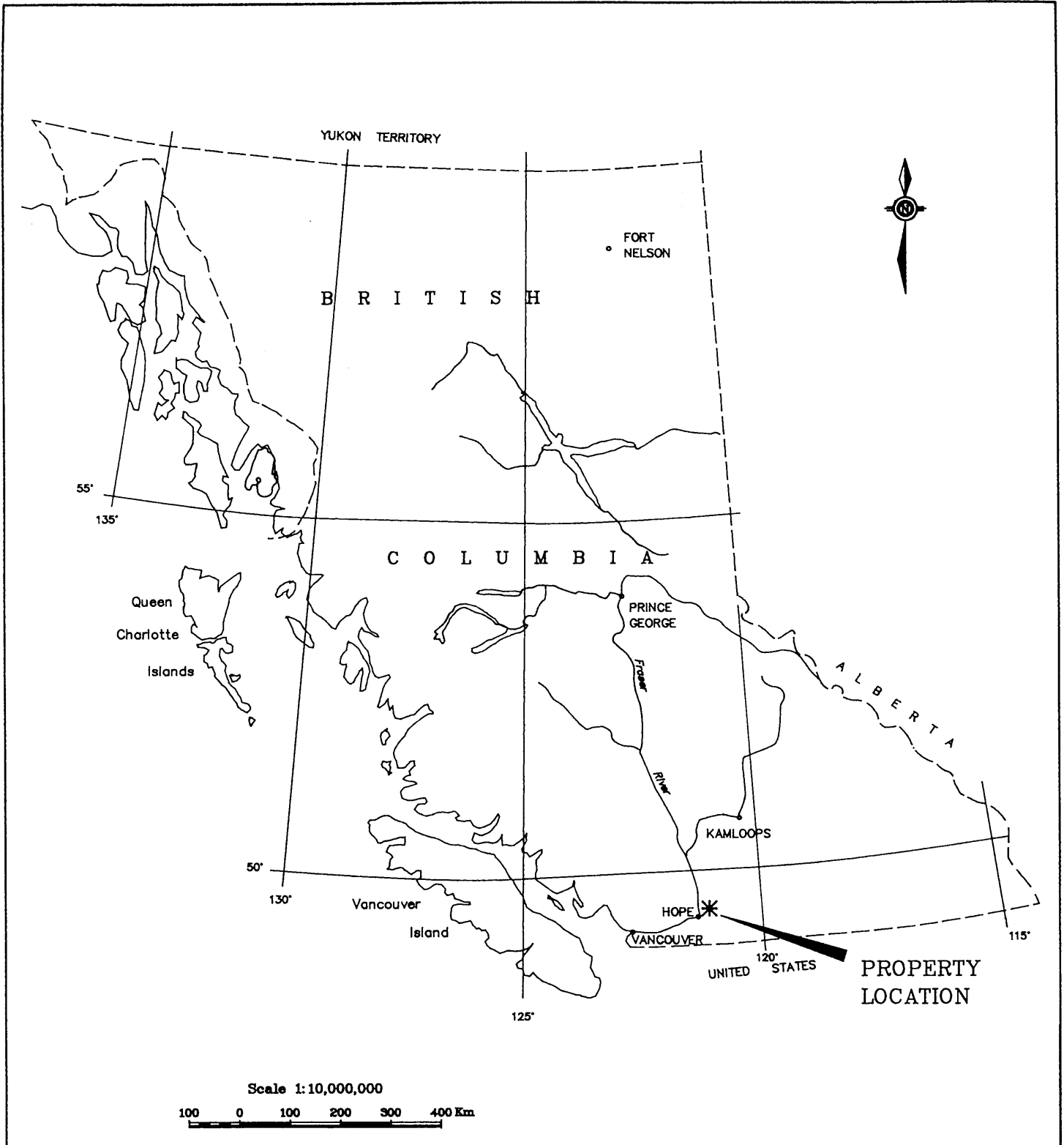
LOCATION AND ACCESS

The Serpentine property is located approximately 145 km east of the City of Vancouver in southwestern British Columbia, Canada. The claims are 18 km northeast of the town of Hope, B.C. on both sides of the Coquihalla River. Access to the Dewdney Creek Quarry is by the new Coquihalla Highway between the Sowaqua and Carolin Mine exits. The quarry is located 1.5 km from the mouth of Dewdney Creek and in December 1990 - January 1991 produced a large quantity of serpentine blocks in the 1.5 to 2 meter size range. Oversize material was stockpiled for later secondary blasting. The Jade Quarry is just past the Sowaqua on-ramp to the east.

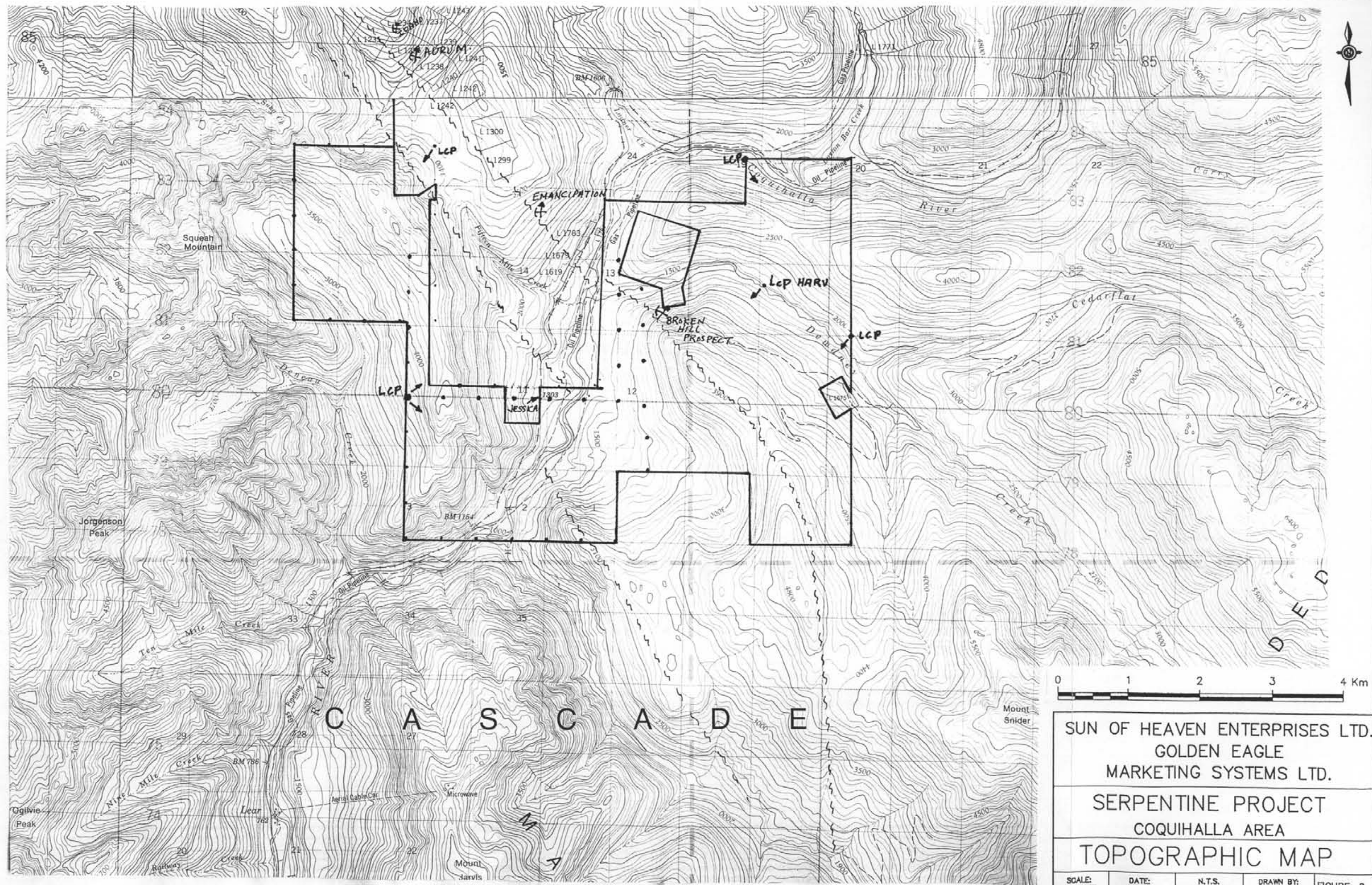
The claims cover the largely overburden-covered valley floors and also the steep mountain slopes which rise to a plateau at about the 1,200 m level. Mature Western Red Cedar, Hemlock and Douglas Fir with minor underbrush dominate the area.

Periodic high water levels are often experienced in the Coquihalla River and local steep gradient tributary creeks. All flood damage is now quickly repaired since the opening of the new Coquihalla Highway. Winter snow levels are known to attain up to 1 meter in depth along the main valley. Considerably deeper snow levels occur higher in elevation. The Jade Quarry is clear of snow by early April.

Since large scale quarry operations have existed in the past in several locations throughout the Project Area, no special environmental problems concerning fish habitat or acid leachate generation are anticipated.



| | | | | |
|---|-------------------|--------------------|----------------------|--------------|
| SUN OF HEAVEN ENTERPRISES LTD. GOLDEN EAGLE MARKETING SYSTEMS LTD. | | | | |
| SERPENTINE PROJECT COQHUIHALLA AREA | | | | |
| LOCATION MAP | | | | |
| SCALE AS SHOWN | DATE June 1991 | N.T.S. 92H/6&11 | DRAWN BY GEO-COMP | Figure: 1 |
| Geology: New Global Resources Ltd. | | | | |



| | | | |
|--------------------------------|------------------|--------------------|------------------------|
| SUN OF HEAVEN ENTERPRISES LTD. | | | |
| GOLDEN EAGLE | | | |
| MARKETING SYSTEMS LTD. | | | |
| SERPENTINE PROJECT | | | |
| COQUIHALLA AREA | | | |
| TOPOGRAPHIC MAP | | | |
| SCALE: AS NOTED | DATE: DEC '90 | N.T.S. 92H/6&11 | DRAWN BY: FIGURE: 2 |
| ENG: New Global Resources Ltd. | | | |

CLAIM STATUS

The Serpentine project consists of 9 claims totalling 135 units as shown in Table 1 and illustrated on Figure 3.

TABLE 1
List of Claims

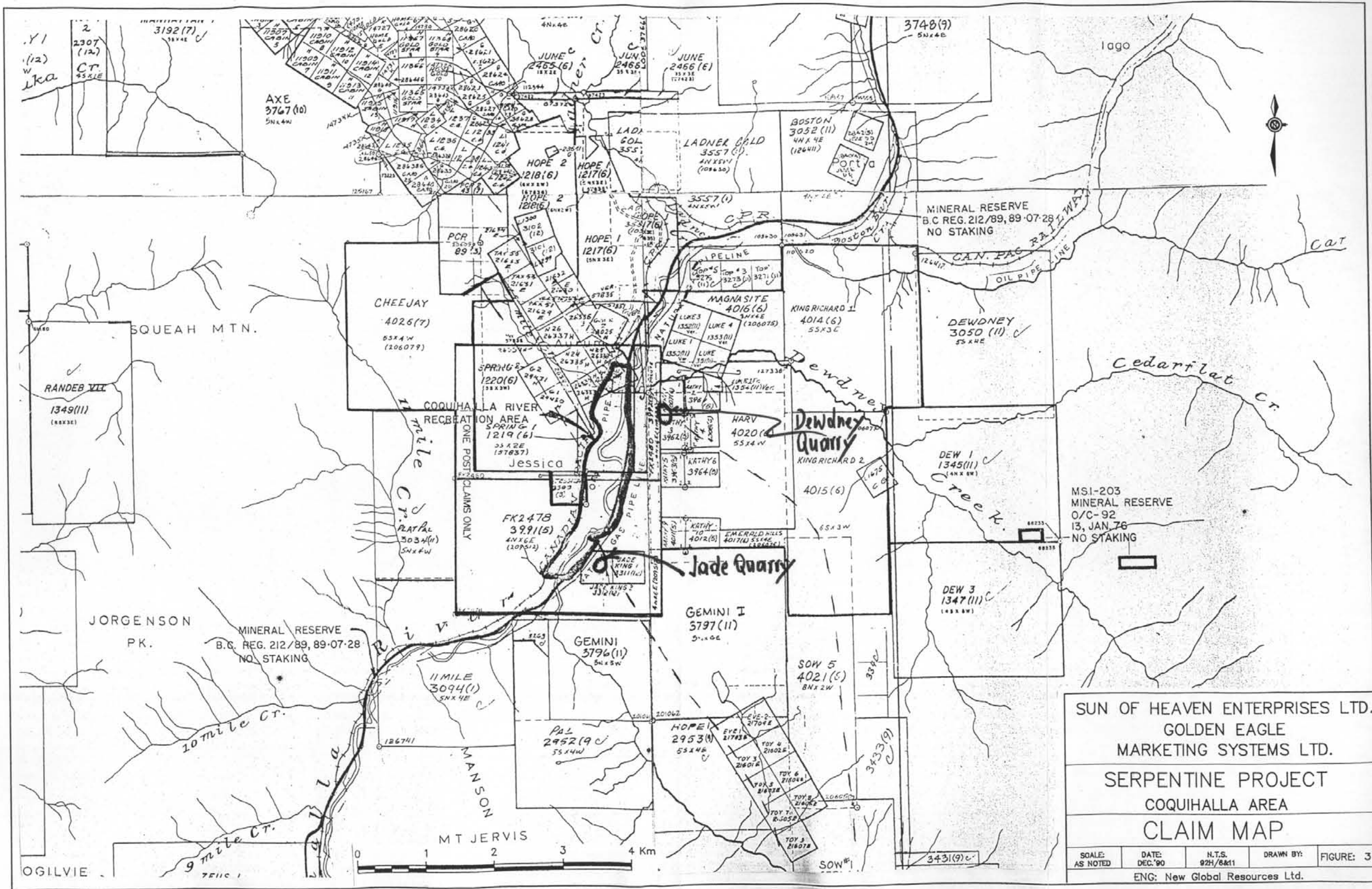
| <u>Claim Name</u> | <u>Record Number</u> | <u>Units</u> | <u>Size</u> | <u>Date Staked</u> | <u>Current Anniversary Date</u> |
|-------------------|----------------------|------------------|-------------|--------------------|---------------------------------|
| King Richard #1 | 4014 | 15 | 5S 3E | Jun 13, 1990 | Jun 13, 1992** |
| King Richard #2 | 4015 | 18 | 6S 3W | Jun 14, 1990 | Jun 14, 1992* |
| Magna Site | 4016 | 12 | 3S 4E | Jun 16, 1990 | Jun 16, 1992* |
| FK 2478 RAC | 3991 | 24 | 4N 6E | May 30, 1990 | May 30, 1993* |
| FK 2480 RAC | 3992 | 24 | 4N 6E | May 30, 1990 | May 30, 1993* |
| HARV | 4020 | 20 | 5S 4W | June 11, 1990 | June 11, 1993* |
| CEEJAY | 4026 | 20 | 4W 5S | July 16, 1990 | July 16, 1992** |
| Jade King One | 3311 | 1 | Two post | Dec 28, 1987 | Dec 30, 1998 |
| Jade King Two | 3312 | <u>1</u> | Two post | Dec 28 1987 | Dec 30, 1998 |
| Total | | 135 units | | | |

* with application of assessment work documented in this report, Serpentine Group 1, May 1, 1991

** Serpentine Group 2, filed June 11, 1991

The Kathy 1-10 two-post claims were all located by A.R. McDougall and sold by Bill of Sale to Sun of Heaven Enterprises in October, 1990 and are now "included" in the Harv mineral claim by application. G. Chappell located the King Richard #1, King Richard #2, Magna Site, Emerald and Ceejay claims as agent for Sun of Heaven Enterprises Ltd. in June and July, 1990. Likewise, the Special Recreation Area Claims and Harv claim were located by G. Johnson and sold to Sun of Heaven Enterprises Ltd. by Bill of Sale in October 1990.

The Kathy two-post claims were located at several different times. Kathy 2, 3, 5 and 6 were staked May 5, 1990 and subsequently Kathy 1, 4, 7, 8, 9 and 10 were staked May 16, 23 and June 7, 1990. Claims Kathy 7 and 8 did not appear on the



SUN OF HEAVEN ENTERPRISES LTD.
 GOLDEN EAGLE
 MARKETING SYSTEMS LTD.

SERPENTINE PROJECT
 COQUIHALLA AREA
 CLAIM MAP

| | | | | |
|--------------------|------------------|--------------------|-----------|-----------|
| SCALE: AS NOTED | DATE: DEC '90 | N.T.S. 92H/6&11 | DRAWN BY: | FIGURE: 3 |
|--------------------|------------------|--------------------|-----------|-----------|

ENG: New Global Resources Ltd.

current claim map and were cancelled "ab initio". All the Kathy are now included in Harv claim. Due to extensive overlap, the Emerald Hills claim did not cover much ground and was allowed to lapse. Considering the varying degree of overlap, the project area includes approximately the equivalent of 112 units or an area of 28 square kilometres, Figure 3.

The Recreation Area Claims (RAC) are administered by special regulations. They are designed to protect certain possible future recreation areas governed by the Parks Act. The Park reserve is actually relatively small and extends only to the immediate river area. A period of ten years has been provided to evaluate mineral resources. The Highways Department is operating under a quarry lease and Crown Land reserve.

Sun of Heaven Enterprises Ltd. optioned the Jade King One and Two claims from Osirus Enterprises Ltd. The Jade King claims cover a small jade deposit and exploration in 1991 further evaluated the potential for larger jade occurrences. The relative claim history of the Jade King claims in regards to surrounding claim boundaries is well reviewed by Shearer (1989A).

HISTORY

The Coquihalla valley has been an important transportation corridor since the fur trade in the mid-1800's. A minor amount of placer gold has been known in the Coquihalla River since the Fraser River Gold Rush of 1858.

A detailed account of the initial gold prospecting, Aurum discovery and then subsequent development of the Idaho Zone into the Carolin Mine can be found in Shearer (1982). The first significant gold claim was staked on September 8, 1913 by Mr. M. Merrick which became the high-grade Emancipation Mine, located 4,500 feet northwest of the Serpentine Project quarry.

Historical notes concerning jade occurrences have been summarized in Shearer (1989A), as follows:

"Jade has long been found along the Coquihalla River from Jessica, (Jessica was a station house on the old Kettle Valley Railway), to the confluence with the Fraser River. The source of these boulders is "clearly from zones within the Coquihalla Serpentine Belt (Cairnes, 1930) which crosses the main river valley at Jessica. The serpentine belt also extends along the east side of the Fraser River for about 20 miles and could account for most of the jade boulders found along the river on various bars from Hope to North Bend.

Michael Fulbrook discovered jade in situ during an inspection of an old road quarry near Sowaqua Creek in the late 1970's. Each year he produced, by hand, a small quantity of jade. In 1981 he contracted Smith Excavating of Hope to expose more jade with a tracked backhoe. The author of this report was shown slabs of high quality jade by Mr. Fulbrook in 1981 and 1982 from his claim. At one point he produced a pick-up truck load of jade which was also shown to the author of this report. Other prospectors in the area have reported finding old rock saws on the hillside above the Jade King Claims.

Activity was high in the Jessica area of the Coquihalla Valley during the late 1920's and 1930's mainly for lode gold. On nearby Ladner Creek work centered around the Emancipation claims found in 1913 and the Idaho claim staked in 1915. A gold orebody on the Idaho claim was put into production by Carolin Mines Ltd. in 1981.

Exploration was pursued on the Idaho through the early 1920's, and in 1926 a silicified zone was found along the serpentine contact. This zone was exposed in a series of open cuts up the hill. During 1927, the open cut work was continued, and encouraging results were obtained from panning the soft, friable, oxidized material lying between a persistent body of quartz and a decomposed serpentine footwall. As this trenching was extended, astonishing values in free gold in a talcose shear zone were revealed.

This startling discovery changed the entire picture of the camp because it called attention to a rock type that had received very little attention in the past but was known to be widespread. Claims were staked rapidly over several miles along the strip of country in which serpentine was present. The serpentine belt became the 'mother lode of the district's gold' in the view of many newcomers who held ground north to Spider Peak. Considerable work was done by W.S. Bradley on claim along Fifteen Mile Creek immediately north of the Jade King Claim. An old adit found in 1988 above the rock quarry on the Jade King Claim probably dates from this time.

Underground development was started immediately on the Aurum Claim under the aegis of Dominion Ore Concentrating Company of New Westminster. Shortly after, Aurum Mines Limited was formed to handle operations. Spectacular small pockets of gold were encountered. A newspaper article in the STAR on October 22, 1930, describes some of the high grade:

"it is of interest to note that from the top of Stope of No. 1 to No. 5 raise, some 10 sacks of ore taken showed values over \$5,892 per ton'.

This was when gold was \$20.67 per ounce. Much of the lower grade material was represented by flaky serpentine with free gold. These small pockets did not sustain an economic operation, and Aurum Mines Limited lost its equity in the claims in 1934 through inability to keep up option payments."

At the Verona siding in 1932, on the old Kettle Valley Railway, the B.C. Soapstone Syndicate mined talc from which trial bricks were cut and tested in various coast pulp mills, with reported favourable results (Spence, 1940).

The area presently covered by the Serpentine Project claims was previously entirely owned by Border Resources Ltd. which still hold two small claim blocks. From 1968 to 1987, a number of work programs were completed by Border Resources Ltd. in regard to nickel/cobalt mineralization of the ultramafic complex (Chamberlain 1972, 1983). Metallurgical tests in 1968 and 1969 indicated that samples assaying 0.23% Ni produced a flotation concentrate of 1.53% Ni with an overall nickel recovery of 46%. The nickel is contained in needles 10 to 50 microns long of pentlandite (Chamberlain, 1983). Five diamond drill holes were completed in 1970 and several thinsections were examined (Chamberlain, 1971). A high resolution, low level airborne magnetometer survey was flown in 1971 which outlined the ultramafic body and produced evidence of cross-faulting near the Coquihalla River (Chamberlain, 1971).

Assay values of samples collected in 1990 by G. Chappell for Sun of Heaven Enterprises Ltd. are presented in a brief note form (Chappell, 1990).

FIELD PROCEDURES AND SURVEY METHODS

Trenching in the Jade Quarry was completed with International 240 Excavator on tracks, contracted from Friskey Excavating Ltd. of Sardis. This hoe is slightly larger than a standard CAT 225. Initial work concentrated on the northwest corner of the known jade deposit. Later an access road was constructed up to the central portion where the effects of a horizontal fault resulted in sheared talc-soapstone and right lateral movement on the serpentinite-chert contact (West Hozameen Fault). Finally, a road was constructed up to the top of the quarry (south end) to investigate the jade-soapstone lense and also float trains of jade to the east.

The large natural serpentine exposures to the east of the Jade Quarry were trenched and about 15 tons sent by tandem dump truck to be crushed at Rosedale.

Geologic mapping was completed on a base map constructed from survey data provided by S. Nickel, B.C.L.S., using a Wild T1000 transit and a Wild DI1000 electronic distance meter. Notes on the accuracy of the survey points is contained in Appendix IV.

Elevations were plotted relative to an assigned base of 100 meters for the Dewdney Quarry. The actual elevation is in the 350 m range. Elevations for the Jade Quarry are taken from a nearby Ministry of Transportation and Highways reference monument having a scribed elevation of 333.7 meters.

A total of 28 points were established in the field with the transit. Descriptions, northings, eastings and elevations of the points are contained in Appendix III.

Additional, fill-in measurements were made during geological mapping using a toposil belt chain and Brunton compass throughout the quarries and tied to the transit stations.

GEOLOGY

Regional Geology

Geology of the Hope Area was compiled by Cairnes (1944) as Map 737A. A number of subsequent detailed studies mainly in the south and central parts of the map sheet were compiled by Monger (Monger, 1970; Figure 4).

Regionally, the map area contains the junction of the Coast Plutonic Complex and the Cascade Fold Belt. The easternmost part forms a segment of the Intermontane Belt. The boundary between the Cascade Fold Belt and the Intermontane Belt is defined by the easternmost major fault of the Fraser River Fault System, The Pasayten Fault. A volcanic island arc assemblage, the upper Triassic Nicola Group and subaerial volcanics of the lower Cretaceous Kingsvale Group dominate the Intermontane Belt.

The northwest-trending Coast Plutonic Complex is composed mainly of tonalitic (quartz diorite) plutons with lesser fault slices of an older metamorphic terrain and extends along the coast of British Columbia and into Alaska, a distance of nearly 1,700 km. The plutons have been dated as largely Cretaceous age, 70 to 140 my, but along the eastern boundary in the Hope Area they are somewhat younger. Partially superimposed on the southern Coast Plutonic Complex is the Cascade Fold Belt which consists of north-trending late Cenozoic, 16 to 60 my, volcanic and intrusive rocks within Precambrian to Mesozoic clastic sediments that extend from California into southern British Columbia (Richards and McTaggart, 1976). These relatively young intrusives are emplaced in extensively deformed Hozameen Group rocks lying southwest of the Hozameen Fault. In the eastern zone of the Fold Belt is a sedimentary trough (Methow-Pasayten Trough) with up to 9,000 m of fine to coarse clastic sediments of the Ladner, Dewdney Creek and Pasayten Groups.

The Fraser River Fault System includes at least five profound, crustal dislocations that have been the locus for extensive strike-slip and dip-slip movements plus cataclastic metamorphism. Two main graben structures form the principle elements of the northern Cascade Fold Belt. One graben extends southward

between the Hope and Yale Faults to beyond the International Boundary. It contains non-marine Eocene clastics and mylonitized Custer gneiss.

The Coquihalla Gold Belt is in the other graben which lies between the Pasayten Fault on the east and the Hozameen Fault on the west. This has been referred to as the Methow Graben by Cochran (1975). From evidence along the fold belt and from adjacent terrains, the Mesozoic rocks were folded and thrust northeastward in Late Cretaceous time after dextral transcurrent movement took place along the principal faults. Emplacement of discordant plutons, for example, the 39 my old Needle Peak body, followed extensive normal displacement on the bounding faults.

The unfossiliferous Hozameen Group is composed of altered basic volcanics, phyllite, ribbon chert and minor limestone. It is similar to and has been correlated with the Fergusson Group on the west side of the Fraser River in the Bridge River Gold Camp. The Hozameen Group contains numerous gold occurrences but no production has resulted. Monger (1977) interprets the Hozameen Group as an oceanic supracrustal sequence of Triassic or pre-Triassic age. In the Carolin mine region the Hozameen Group rocks have been subjected to lower greenschist metamorphism and strong deformation; some parts are overprinted by either a schistosity or an intense, subhorizontal mullion structure. Close to the serpentine belt, Hozameen Group rocks commonly show signs of increased deformation and crushing, minor silicification, late brittle faulting, and pronounced slickensiding. The West Hozameen fault appears to dip steeply east, and serpentinites in the immediate vicinity contain highly sheared talcose rocks.

Regionally, serpentine is the most abundant ultramafic rock-type, and is predominant in the Coquihalla serpentine belt. In many places it shows all transitions to partly serpentized peridotite from which it is not distinguished on the map (Cairnes, 1930). The serpentinite and serpentized peridotite are dark green to black, massive to highly fractured with shiny fracture surfaces and locally contain lustrous pale green patches of bastite pseudomorphous after enstatite. Discontinuous veins of chrysotile asbestos are sparsely distributed throughout the rock. All gradations exist from an aggregate of bladed low-birefringent serpentine containing a mesh of magnetite grains and no primary silicate minerals, to a rock

composed of anhedral olivine and subhedral to euhedral enstatite grains with minor serpentinization along fractures. Pseudomorphs after pyroxene and olivine are abundant in the Coquihalla Belt. Ray (1986) reports that unaltered olivine is rare in the Coquihalla Belt in comparison to the Petch Creek Serpentine Belt near Boston Bar. Magnetite and chromite are present in most serpentinite. Alteration of serpentinite is of four main types: talc, red-weathering carbonate-quartz-mariposite rock, and talc-carbonate rock, and nephrite-white rock.

Intimately associated with serpentinite in the Coquihalla area are (1) altered basic volcanic rock and local pyroclastics that belong to the Hozameen Group and (2) gabbro and diorite of uncertain age. Thus the total amount of serpentinite in this belt appears to be greater than it is, but to differentiate all rock types present would require detailed mapping. The gabbroic and dioritic rocks are almost indistinguishable in the field from the altered volcanics and intrude the volcanics and form large dyke-like bodies in the serpentinite (Ray, 1990). The gabbroic lenses generally occupy fault-bounded, structural boudins within the serpentinite, but in some localities remnant chilled margins suggest that the gabbros intrude the serpentinite (Ray, 1986).

Ladner Group greywacke and slate of Jurassic age are host to the mineralized, sulfide-rich alteration zones at the Idaho and Pipestem Mines. Slate, interbedded with sandstone, is characteristic of the northern sections, but nearer Manning Park the group consists mainly of volcanic sandstone and pelite intercalated with flows and pyroclastics. Graded bedding, groove casts and flute casts indicate these rocks were deposited by turbidity currents. Ladner Group rocks form a northwesterly-trending syncline that is best exposed in Manning Park. This syncline is progressively obscured toward the north by the Hozameen Fault and Needle Peak pluton.

Local Geology

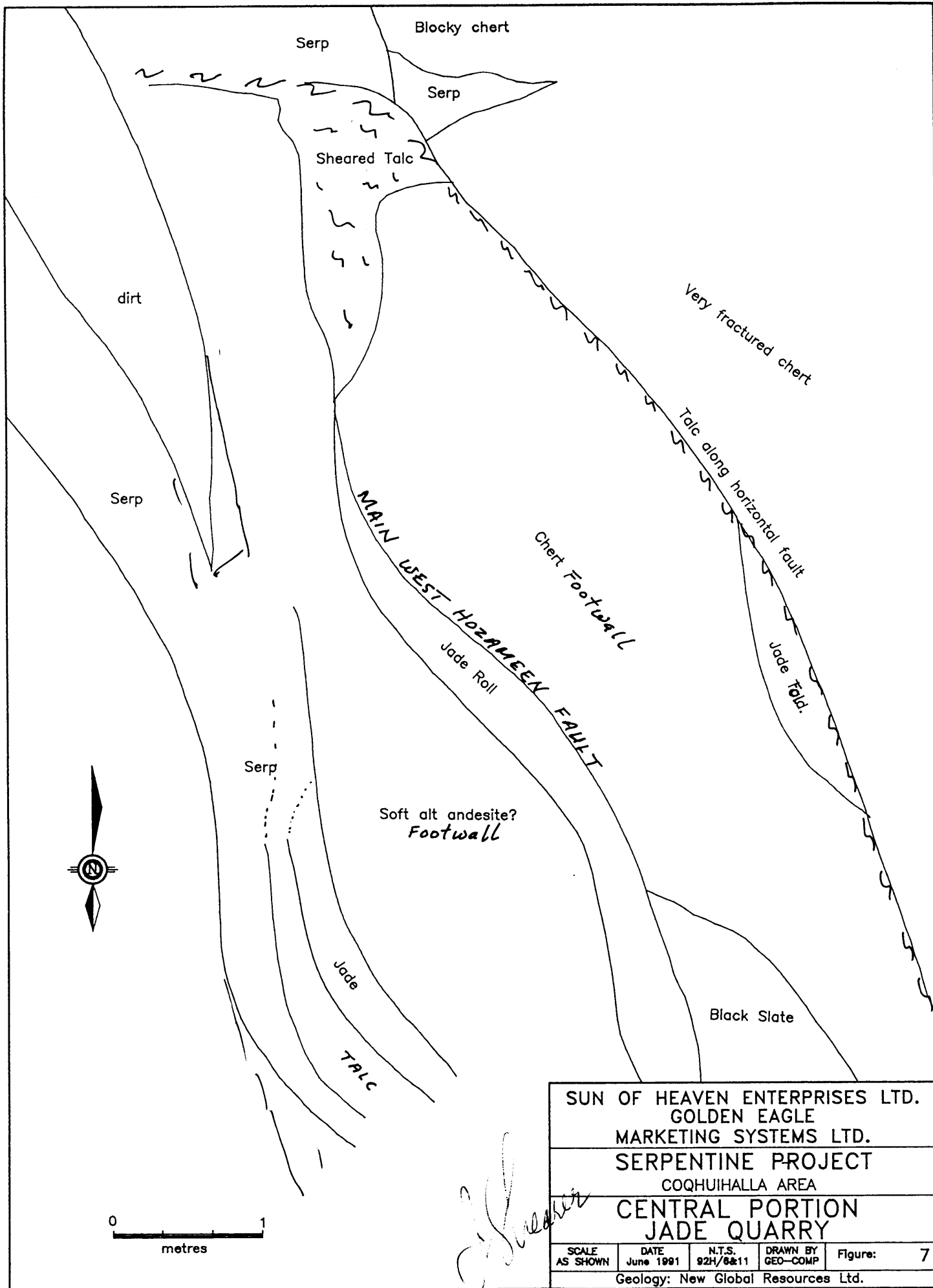
Detailed geological mapping has been completed in the two rock quarries, Figures ~~7~~ 7 to 9. Available smaller scale data have been summarized on Figure 5. The known nephrite deposits on the Jade King claims are associated with the West Hozameen fault zone and lie between Hozameen Group chert-altered mafic volcanics on the west and serpentinite-soapstone on the east (Shearer, 1989A). The chert is greenish-grey to grey coloured and is laced by numerous close-spaced black hairlines. Commonly, these siliceous rocks are very thinly laminated and can be termed ribbon cherts. The altered mafic volcanics appear to be basaltic in composition. They are usually rusty weathering, very fine grained, dark green rocks.

The main serpentinite contact (West Hozameen Fault) is located within the jade layer. Typically, the serpentine is quite variable, ranging from black to dark green and is highly sheared and foliated near the contact. Cliff-forming massive outcrops occur farther to the east.

Minor, fine to medium grained dioritic intrusive occurs in the immediate footwall of the jade deposit. The chert is contorted and bleached near the serpentinite-filled fault zones and commonly forms a highly lineated siliceous footwall to the jade deposit. Chert is occasionally altered to a pea-green friable material at surface.

The West Zone Nephrite Deposit on the Jade King claim can be subdivided (from west to east) into the following zones:

- (1) rusty chert, chloritic volcanics, black slate and altered dykes;
- (2) highly altered chert, quartz lenses and veins, minor pyrite having a pronounced banded texture;
- (3) tremolite-quartz zones (white rock);
- (4) jade (nephrite) seams, lenses and pods;
- (5) soapstone, jade-like minerals;
- (6) serpentinite, diorite, talc lenses.



| | | | | |
|------------------------------------|-------------------|--------------------|----------------------|-----------|
| SUN OF HEAVEN ENTERPRISES LTD. | | | | |
| GOLDEN EAGLE | | | | |
| MARKETING SYSTEMS LTD. | | | | |
| SERPENTINE PROJECT | | | | |
| COQHUIHALLA AREA | | | | |
| CENTRAL PORTION | | | | |
| JADE QUARRY | | | | |
| SCALE AS SHOWN | DATE June 1991 | N.T.S. 92H/6&11 | DRAWN BY GEO-COMP | Figure: 7 |
| Geology: New Global Resources Ltd. | | | | |



TOP OF QUARRY

Jade-talc

Serpentine
very
shattered

Serp?

CLIFF

very shattered
serp

very altered
chert, rusty

shear planes

very rusty

altered gabbro dyke?

Talc

very shattered
altered gabbro

Talc Jade pods

rusty chert

stub road

very sheared
talc

serp sheared

Roadway
May 15, 1991

shear
plane

down slope

dug up & broken
chert & slate blocks

fallen from above



| | | | | |
|--|-------------------|--------------------|----------------------|-----------|
| SUN OF HEAVEN ENTERPRISES LTD. GOLDEN EAGLE MARKETING SYSTEMS LTD. | | | | |
| SERPENTINE PROJECT COQHUIHALLA AREA | | | | |
| SOUTH PORTION JADE QUARRY | | | | |
| SCALE AS SHOWN | DATE June 1991 | N.T.S. 92H/8&11 | DRAWN BY GEO-COMP | Figure: 8 |
| Geology: New Global Resources Ltd. | | | | |

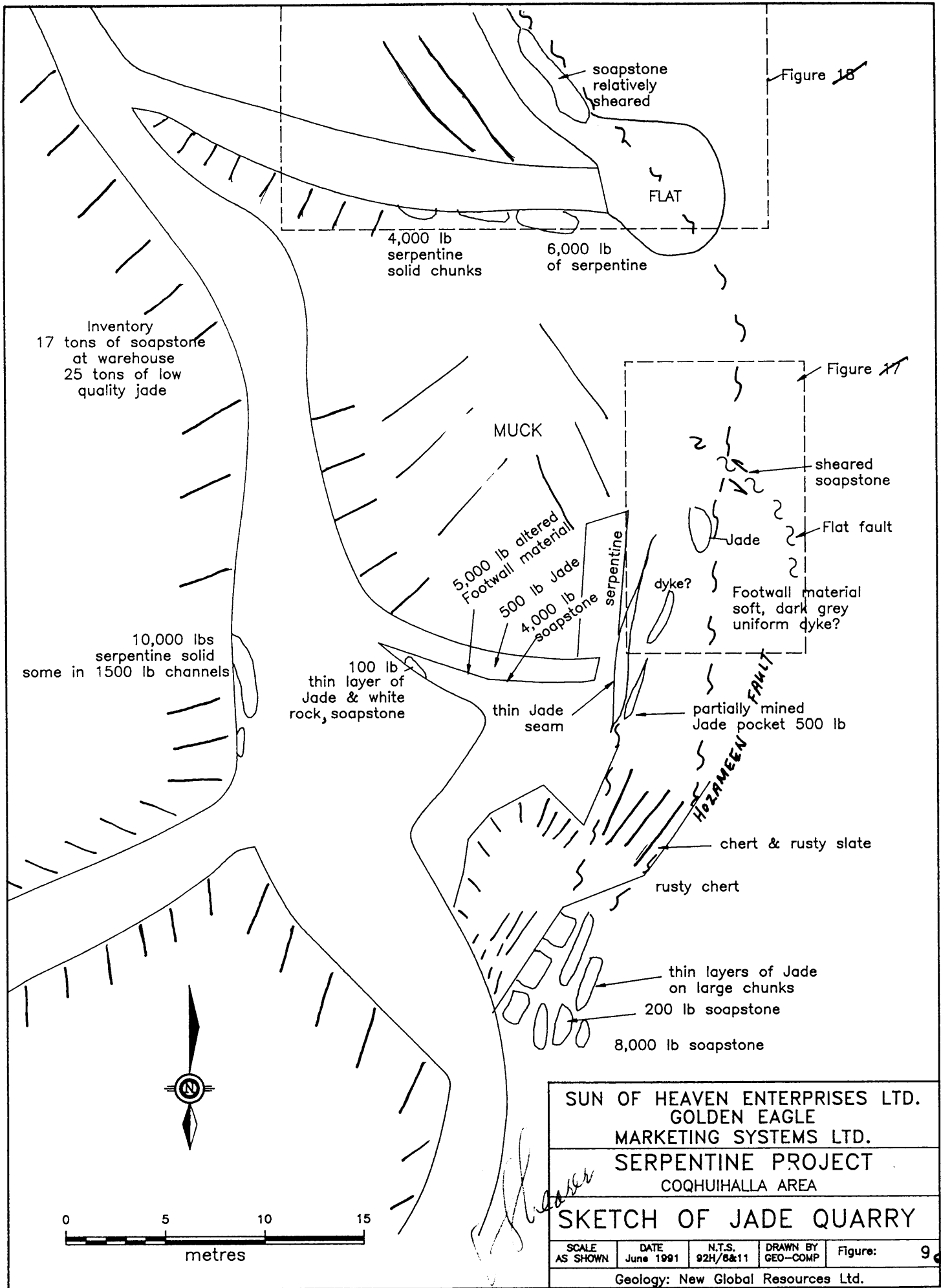


Figure 18

Figure 17

SUN OF HEAVEN ENTERPRISES LTD.
 GOLDEN EAGLE
 MARKETING SYSTEMS LTD.
 SERPENTINE PROJECT
 COQHUIHALLA AREA

SKETCH OF JADE QUARRY

| | | | | |
|-------------------|-------------------|--------------------|----------------------|--------------|
| SCALE AS SHOWN | DATE June 1991 | N.T.S. 92H/8&11 | DRAWN BY GEO-COMP | Figure: 9 |
|-------------------|-------------------|--------------------|----------------------|--------------|

Geology: New Global Resources Ltd.

Near surface jade was initially recovered as flat plates 2 to 5 cm thick. Much of this apple-green nephrite is curved and folded. Small-scale kink folds are common in the talc-rich sections.

The entire West Zone pinches and swells along strike. Minimum widths appear to be approximately 5 to 10 centimeters which varies sharply over short distances up to widths exceeding 1.5 metres in the widest pods. Since jade is formed in a low temperature/high pressure environment, the slightest variation in the fault plane causes a wide variety of mineral assemblages.

In general the West Hozameen Fault dips about 75° to 80° east. However, in detail the fault "rolls" considerably and even has local west dips, Figure 7. The crest of these rolls appear to control the location of the jade lenses and can be followed in a vertical sense along the quarry wall. Some jade also appears to "flare" away from the crest of the fault roll within small fractures. Similarly, jade and talc have been remobilized along the flat cross-fault in the central portion of the quarry, Figure 9. A large lense of talc-soapstone occurs east of the fault entirely within a very altered gabbro dyke in the upper or south portion of the Jade Quarry, Figure 8.

To continue production of jade the present quarry face will need to be benched down in search of more thick pods. Alternatively, the south strike extension of the West Hozameen Fault is largely unexplored. Previous reports of old rock-saws farther up the hillside remain to be checked in detail. The fault intersects the Sowaqua Logging road at about 3.5 km and is covered at the roadside. Large exposures of serpentinite occur within 30 meters to the east and additional road cuts of serpentinite are located on the west side of Sowaqua Creek.

TONNAGE CALCULATIONS, DEWDNEY QUARRY

Cross Sections A to F were entered into the AutoCad computer program for presentation purposes and the area where serpentine had been removed was measured by the program as illustrated on Figures 5, 6, 7, 8, 9 and 10.

These areas were used to calculate tonnages by the Frustrum formula:

$$\frac{A + B + \frac{AB}{3} \cdot H \cdot S.G.}{3} = \text{tonnes}$$

Where:

- A = Area in square meters of Section A
- B = Area in square meters of Section B
- H = Perpendicular distance in meters (30 m between each section)
- S.G. = Specific Gravity = 2.6 approximately for serpentine (could be slightly higher up to 3.0) with higher magnetite content

Areas and Tonnages are shown in Table 2.

TABLE 2
Tonnage Calculation by Cross Section

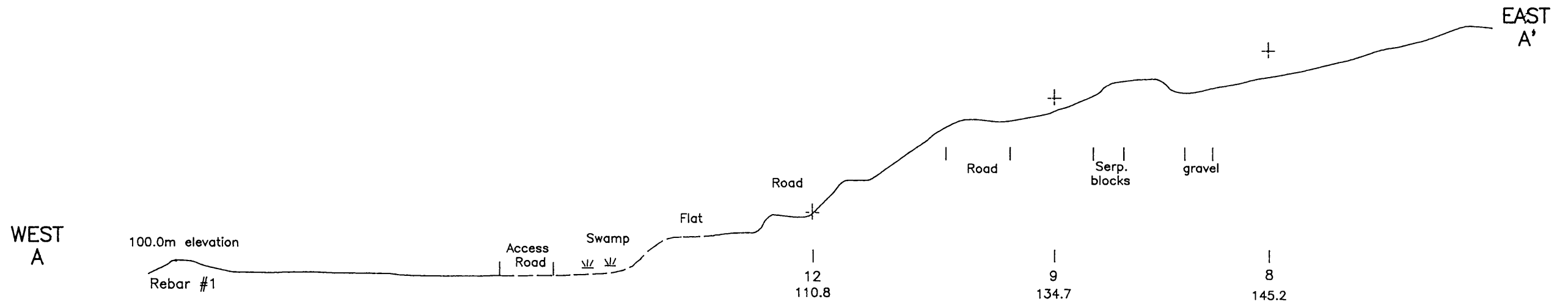
| | Area of Upper Bench (sq.m.) | Area of Lower Bench (sq.m.) | Perpendicular Distance (m) | Tonnage Upper Bench | Tonnage Lower Bench | Section Totals |
|-----------|--------------------------------------|--------------------------------------|----------------------------------|---------------------------|---------------------------|-------------------|
| A | Zero | Zero | 30 | *A-B 144 | *A-B 557 | 701 |
| B | 23.5 | 64.7 | 30 | B-B 8,088 | B-C 16,630 | 24,718 |
| C | 216.3 | 411.7 | 30 | C-D 18,736 | C-D 30,377 | 49,113 |
| D | 264.9 | 367.6 | 30 | D-E 18,845 | D-E 32,907 | 51,752 |
| E | 219.0 | 478.6 | 30 | E-F 7,028 | E-F 16,277 | 23,305 |
| F | 8.4 | 29.2 | 30 | | | |
| Sub-total | | | | 52,841 | 96,748 | 149,589 tonnes |

GRAND TOTAL

149,589 tonnes
or 165,000 tons

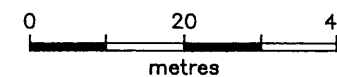
* H = 5 m at 0.1 B area

To obtain tons, the number of tonnes were multiplied by 1.1023 to give 164,892 tons or rounded off to 165,000 tons.

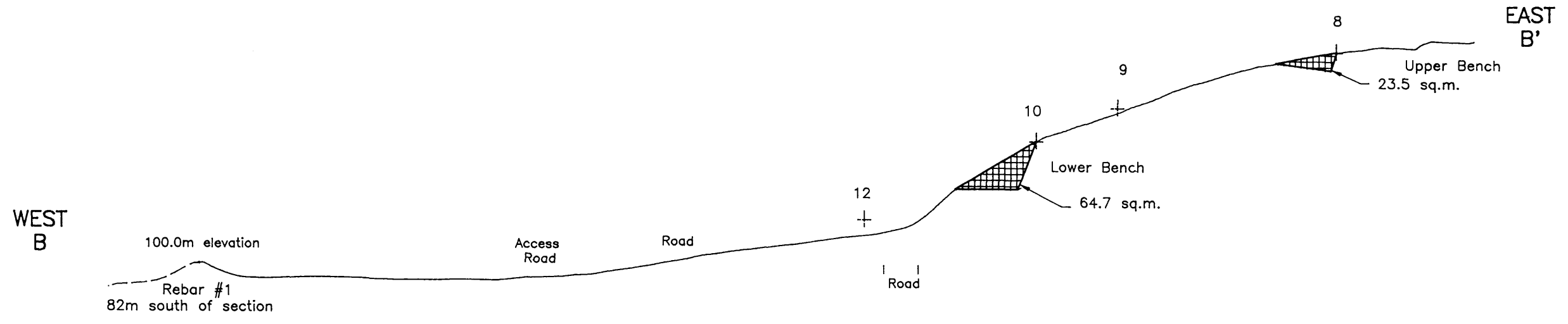


Note: no rock removed from this section

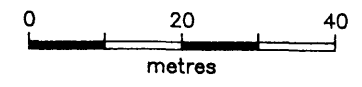
Looking North
Section West to East



| | | | |
|--|--------------------|---------------|----------------------|
| SUN OF HEAVEN ENTERPRISES LTD. GOLDEN EAGLE MARKETING SYSTEMS TLD. | | | |
| SERPENTINE PROJECT COQUIHALLA AREA | | | |
| CROSS SECTION A-A' | | | |
| SCALE 1:1,000 | DATE March 1991 | NTS 92H/9W | DRAWN BY GEO-COMP |
| | | | Figure: 10 |



Looking North
Section West to East



| | | | |
|--|--------------------|---------------|----------------------|
| SUN OF HEAVEN ENTERPRISES LTD. GOLDEN EAGLE MARKETING SYSTEMS TLD. | | | |
| SERPENTINE PROJECT COQUIHALLA AREA | | | |
| CROSS SECTION B-B' | | | |
| SCALE 1:1,000 | DATE March 1991 | NTS 92H/9W | DRAWN BY GEO-COMP |
| | | | Figure: 11 |

WEST
C

100.0m elevation
Rebar #1
52m south of section

Road

Flat

13

14

10

9 11

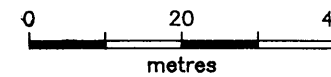
8

411.7 sq.m.

216.3 sq.m.

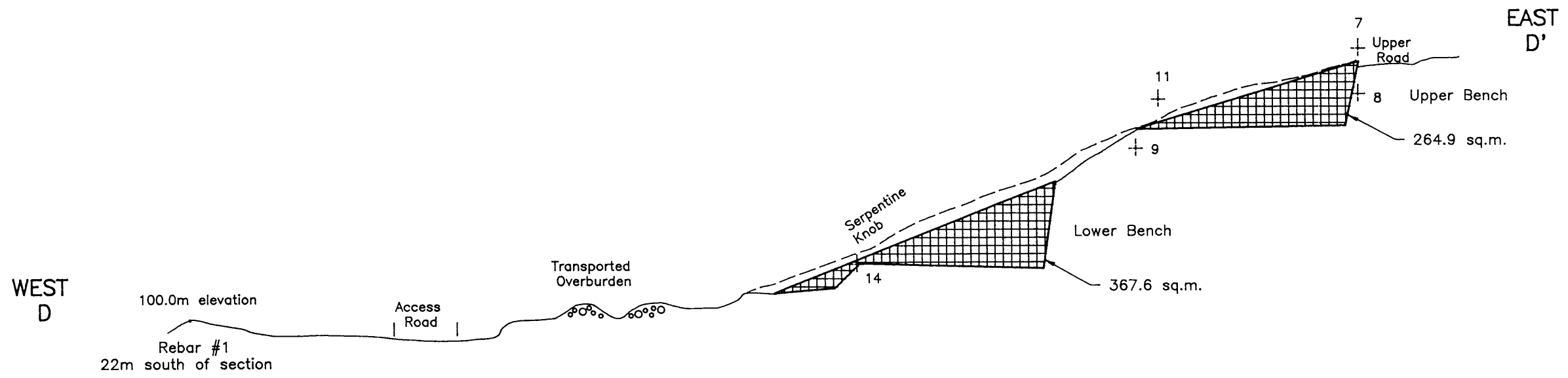
EAST
C'

Looking North
Section West to East

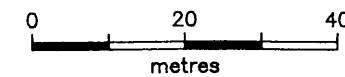


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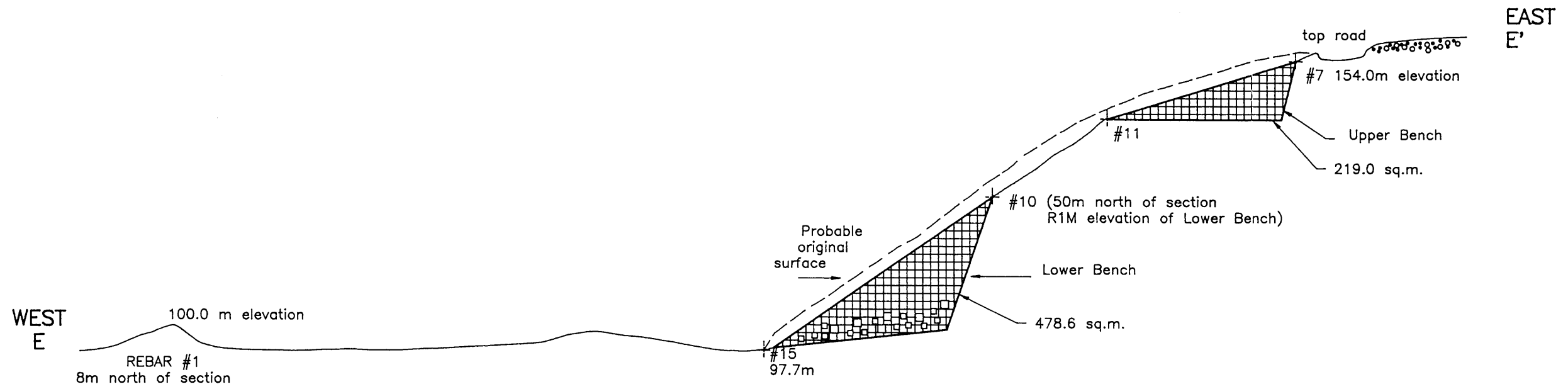
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| SUN OF HEAVEN ENTERPRISES LTD. GOLDEN EAGLE MARKETING SYSTEMS TLD. | | | |
| SERPENTINE PROJECT COQUIHALLA AREA | | | |
| CROSS SECTION C-C' | | | |
| SCALE 1:1,000 | DATE March 1991 | NTS 92H/9W | DRAWN BY GEO-COMP |
| | | | Figure: 12 |



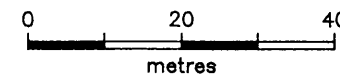
Looking North
Section West to East



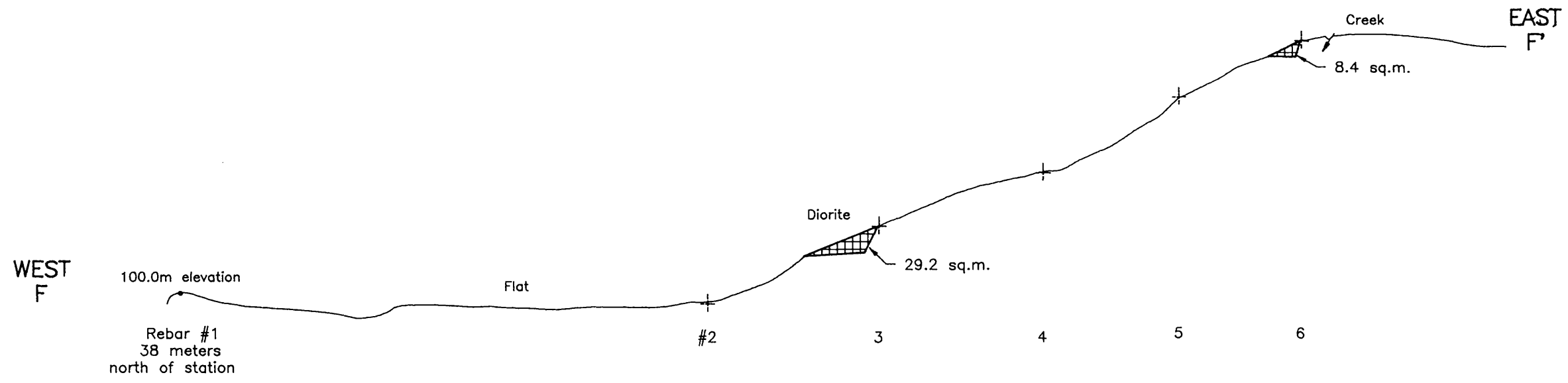
| | | | | |
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| SUN OF HEAVEN ENTERPRISES LTD. GOLDEN EAGLE MARKETING SYSTEMS TLD. | | | | |
| SERPENTINE PROJECT COQUIHALLA AREA | | | | |
| CROSS SECTION D-D' | | | | |
| SCALE 1:1,000 | DATE March 1991 | NTS 92H/9W | DRAWN BY GEO-COMP | Figure: 13 |



Looking North
Section West to East

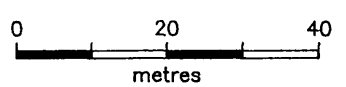


| | | | |
|--|--------------------|---------------|----------------------|
| SUN OF HEAVEN ENTERPRISES LTD. GOLDEN EAGLE MARKETING SYSTEMS TLD. | | | |
| SERPENTINE PROJECT COQUIHALLA AREA | | | |
| CROSS SECTION E-E' | | | |
| SCALE 1:1,000 | DATE March 1991 | NTS 92H/9W | DRAWN BY GEO-COMP |
| | | | Figure 14 |



Note: very little rock has been removed from this section

Looking North
Section West to East



| | | | | |
|--|--------------------|---------------|----------------------|------------|
| SUN OF HEAVEN ENTERPRISES LTD. GOLDEN EAGLE MARKETING SYSTEMS TLD. | | | | |
| SERPENTINE PROJECT COQUIHALLA AREA | | | | |
| CROSS SECTION F-F' | | | | |
| SCALE 1:1,000 | DATE March 1991 | NTS 92H/9W | DRAWN BY GEO-COMP | Figure: 15 |

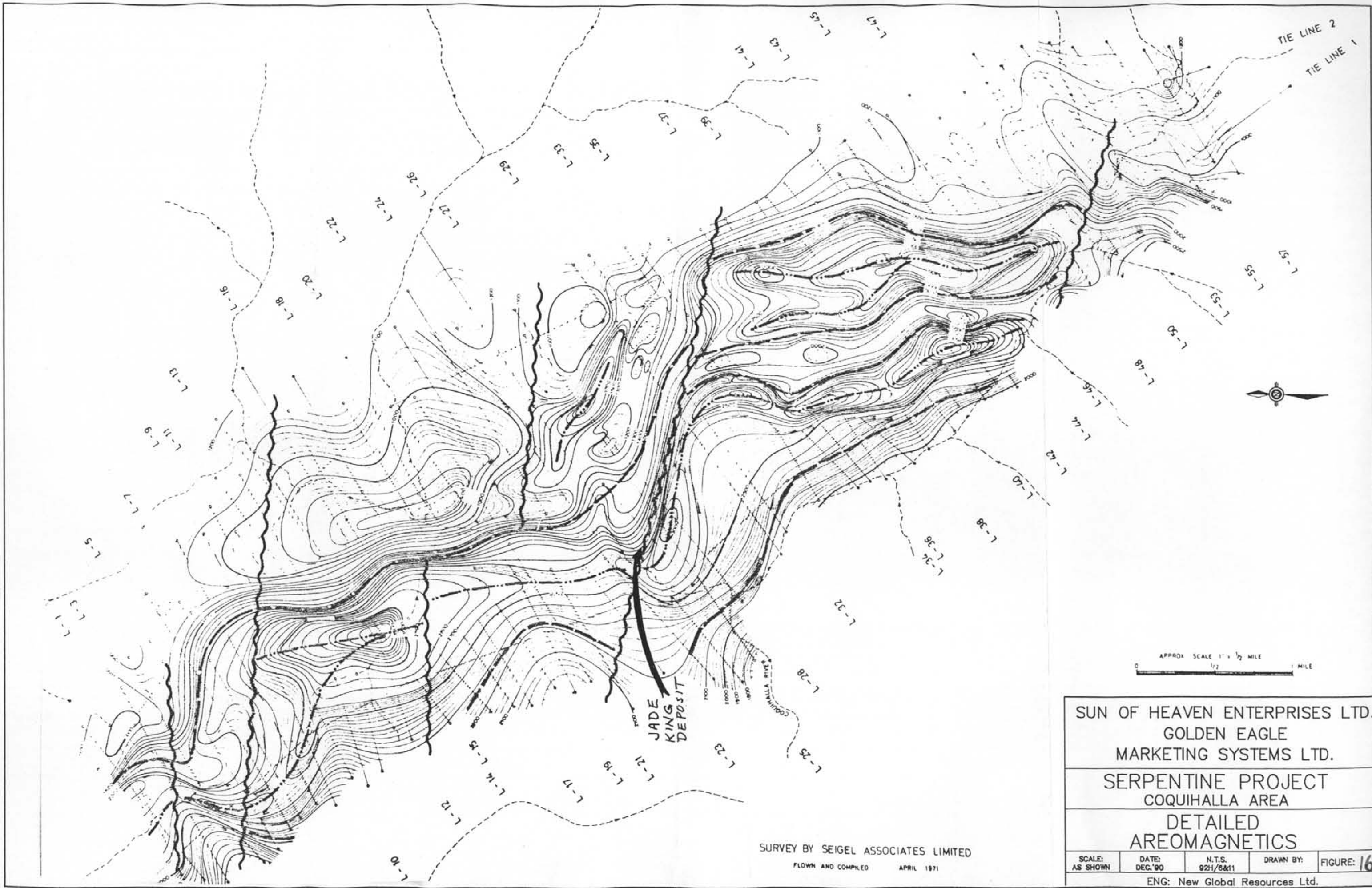
GEOPHYSICS

Aeromagnetic information for the Serpentine Project area is available as Geophysical Series Map 8534G.

The Coquihalla Serpentine Belt is defined by a long linear magnetic high with peaks to 58,600 gammas. The Jade King claims are at the northwest end of a local magnetic anomaly. The serpentinite-gabbro complex is clearly off-set to the southeast of the Jade King claim. A right-lateral displacement of approximately 1.5 km has occurred along the Coquihalla Valley. This concentration of major faulting may have contributed to localization of the alteration zones and associated jade. The serpentinite-Jade fault zones appear to be a subparallel splay off the nearby Hozameen Fault.

The Ladner Group metasedimentary rocks to the east of the Jade King claim is characterized by a relatively lower and more uniform magnetic signature. The Hozameen Group cherts and mafic volcanics to the west of the Jade King claim contain numerous small magnetic highs within a relatively low background. This may reflect the presence of small gabbroic intrusions.

A detailed airborne magnetic survey was completed in 1971 over the entire Serpentine Project (Crosby and Steele, 1971) (Figure 16). The survey traverses were flown by helicopter at a nominal 200 meter line interval along lines oriented northeast-southwest at a mean terrain clearance of 90 meters. This high resolution survey is broadly comparable to the regional survey discussed above. The magnetic pattern is interrupted in several locations and probably indicates extensive lateral (east-southeasterly) trending faults, Figure 8. The mapped gabbro-diorite bodies appear to coincide with magnetic depressions.



SURVEY BY SEIGEL ASSOCIATES LIMITED
 PLOWN AND COMPIED APRIL 1971

| | | | | |
|--------------------------------|------------------|--------------------|-----------|------------|
| SUN OF HEAVEN ENTERPRISES LTD. | | | | |
| GOLDEN EAGLE | | | | |
| MARKETING SYSTEMS LTD. | | | | |
| SERPENTINE PROJECT | | | | |
| COQUIHALLA AREA | | | | |
| DETAILED | | | | |
| AREOMAGNETICS | | | | |
| SCALE: AS SHOWN | DATE: DEC '90 | N.T.S. 921/8&11 | DRAWN BY: | FIGURE: 16 |
| ENG: New Global Resources Ltd. | | | | |

INDUSTRIAL MINERAL POTENTIAL

Although the occurrence of nephrite jade has been known in British Columbia since prehistoric times, it was only after the mid-1960's that substantial production of nephrite started and was centered in the Lillooet-Bridge River and Omineca areas of British Columbia. The general characteristics of Canadian jade is well documented by Leaming (1978), who defines the term as follows:

"Jade and the related terms, jadeite, chloromelanite and nephrite are variously defined in the literature. Jade is the name applied to aggregates of either of two different minerals. One, a variety of amphibole, is called nephrite, the other a variety of pyroxene is called jadeite."

Jade is commonly used as a decorative stone in small sculptures and jewellery. Locally, it is sold through rock and gem shops, jewellery stores and souvenir shops. Much of the current supply is from a few sporadic producers. Substantial quantities are exported to the Far East.

In 1991, selected jade blocks from the Jade King deposit were sawn into slabs with a diamond blade. Some of this material was excellent quality, translucent fracture-free mottled jade of jewellery grade and very few impurities, such as chromite or magnetite, were present. Large quantities of superior grade soapstone is associated with the Jade King deposit. Other possible lapidary materials such as white rock and jade-like altered footwall are also abundant.

Leaming (1978) discusses the grades of nephrite jade on Page 17:

"Grade of nephrite means the degree of suitability of the material for commercial purpose. This is distinct from the classification of nephrite as set out in the preceding chapter. It is applicable only to cut blocks as normally produced during the operations of jade properties. It cannot be applied to outcrops or large boulders without extensive core drilling or sawing.

Nephrite varies widely in lapidary qualities mainly on the basis of colour, impurities, fractures and structure. The trade preference is for 'lively' green shades although jet black material is sold. The off-white, 'mutton fat' jade of some Chinese carvings is highly prized but this variety has not been found in Canada. Uniform colour is preferred to mottled or variegated colour in jewellery although for carving the latter defect is tolerated. The main impurity in most nephrite is a

"mineral of the spinel group, i.e. chromite, magnetite or picotite, which form black spots and streaks and may undercut and cause pitting in the finished articles. Some nephrite may contain streaks of talc, or chlorite which are also undesirable. Chrome garnet is present in some Canadian nephrite but whether or not this is undesirable depends on the personal taste of the user. Many think that bright emerald green spots and splashes, for example material from the Cassiar Asbestos open pit, are attractive.

Fractures are a serious defect in nephrite. They are unsightly and if present in carving stone or gemstone there is a danger of breaking where the fractures are only weakly healed. A few widely spaced fractures may not be serious, but microfractures may be so closely spaced that even a small cabochon cannot be cut from the material.

Structure refers to the grain imparted by preferred orientation of the component fibre groups. These affect the way the material behaves during polishing - sawing must be in the right direction to give the best polished surfaces. The best material will be structurally isotropic, that is it will have little or no grain; the worst may be structurally anisotropic and in fact be a tremolite schist.

Commercial nephrite may be divided into a superior class, gem grade, and an inferior class, the carving grade. Lower grade gem class material merges with higher grade carving class, and the division is arbitrary. Grade C therefore includes material from which gem quality material may be cut. It should be noted that some of the properties listed under the highest grade (Grade A, Fig. 6) may persist through all the grades, but none of the properties listed under "F" may persist past the carving grade "C".

There is no generally accepted grade scale in use in the industry in British Columbia. Commonly there may be a three-fold grading using such designations as no. 1, 2, or 3, or A, B, C, and descriptive terms such as select, choice, average, may be used without any stated specifications other than vague colour designations.

In order to give some quantitative basis to the grades shown on Figure 6, the percentage scale shown below the grade scale assumes that desirable and undesirable properties are progressive. This is a gross oversimplification as both the desirable and undesirable properties may persist from one grade to the other. Thus, sound green material may be so badly fractured that it cannot be used for commercial purposes and would therefore be noncommercial."

Much of the present production of jade from the Jade King deposit was from near surface sections of the zone. No explosives were employed and the jade-soapstone naturally breaks out in 500 to 2,000 lb. chunks. Often the thin jade seam and 1 to 2 meter thickness of soapstone will be produced in a single piece.

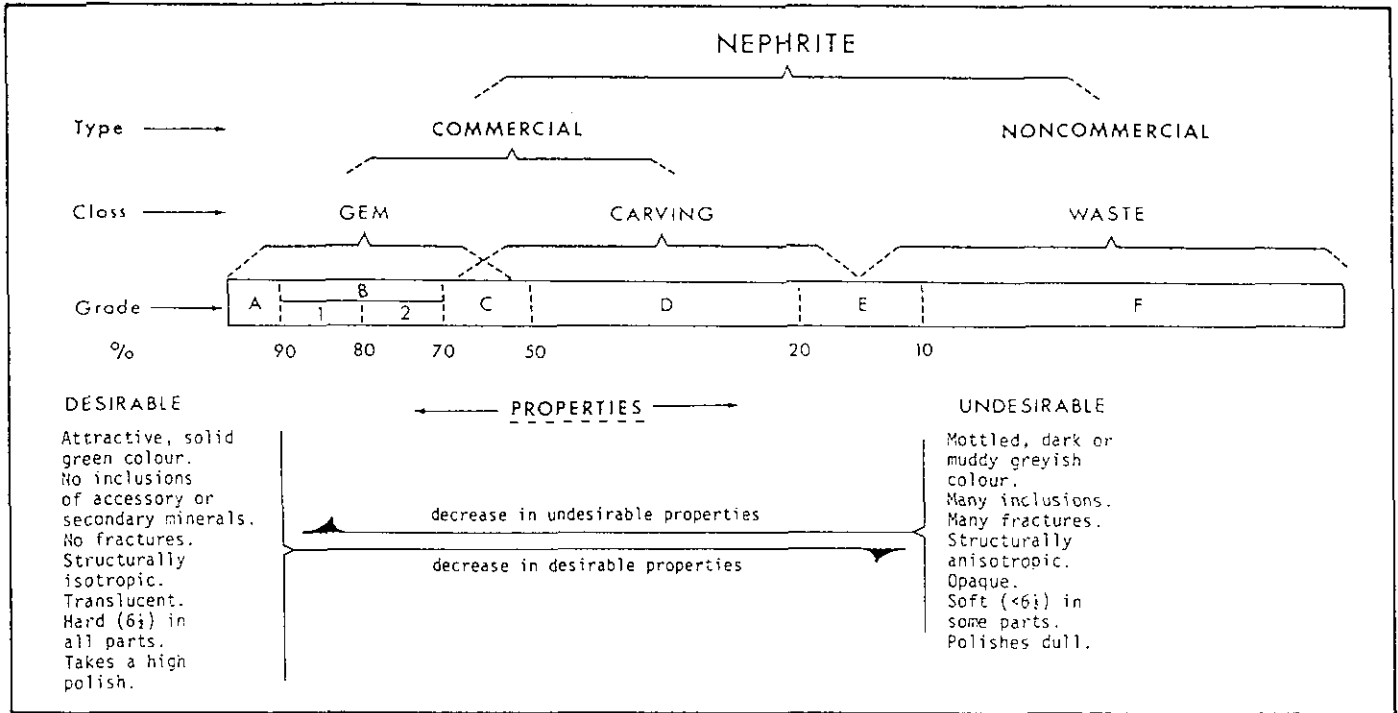


FIGURE 17
(from Leaming, 1978)

In the final stages of the trenching program, a special long tooth was employed on the excavator bucket to produce larger chunks from the thinner part of the jade zone. To test the feasibility of benching down along the dip of the deposit, a series of long holes were drilled into the footwall and low strength explosives were used to break a slot in the footwall rocks. The small amount of explosives were over 2 meters from the jade seam and a careful examination revealed no microfracturing in the jade. Table 3 lists some of the stones readily available for possible sale.

TABLE 3

Stockpile List 1991 and Available Materials

| <u>Commodity</u> | <u>Location</u> | <u>Estimated Quantity</u> | <u>Remarks</u> |
|--|----------------------------|---------------------------|--|
| (1) Jade | Hope Warehouse | 5,000 lb. | closely associated with soapstone, requires sawing |
| (2) Jade | Jade Quarry | 3,000 lb. | separate slabs and associated with soapstone, requires sawing |
| (3) Jade | Hope River Yard | 50,000 lb. | mostly lower grade jade with fractures, all chunks with at least one sawn face, largest chunk 14,000 lb. |
| (4) Soapstone | Hope Warehouse | 35,000 lb. | mainly in large chunks, over 900 lb. each, some cut |
| (5) Soapstone | Jade Quarry | 35,000 lb. | large and small chunks |
| (6) Carvable Serpentine | Jade Quarry | 14,000 lb. | solid chunks, few fractures |
| (7) Slickensided Serpentine | Jade Quarry & Sowaqua Road | 100 tons | considering only material broken out and immediately at hand |
| (8) Large Block Serpentine | Dewdney Quarry | 100 tons | production of 20-30 ton blocks possible |
| (9) Ribbed Siliceous Footwall Material | Jade Quarry | 5,000 lb. | takes a good polish, attractive patterns |
| (10) White Rock | Jade Quarry | 2,000 lb. | associated with some of the jade pockets |
| (11) Soft Altered Green Footwall | Jade Quarry | 10,000 lb. | takes a good polish |

J. Weaver

A very large amount of serpentinite is available on the claims. Table 4 illustrates the normal range of marketable characteristics commonly required in the dimension stone market. In some localities, the abundance of slickensides gives the rock a natural polished face on all surfaces. In contrast, other localities can produce fracture-free blocks in the 20-30 ton range. Numerous serpentine samples were polished during the 1991 program.

Serpentine stone products are commonly included in the "marble" classification within the dimension stone market and are used mainly for interior applications. Chemical weathering of iron-rich silicates such as Olivine, pyroxene and epidote is of concern in exterior facings.

TABLE 4
Marketable Characteristics
of Dimension Stone (Marble)
(after Page, 1989)

Exterior Applications

- | | | |
|-----|------------------------------|------------------------------|
| (1) | minimum density | 2595 kg/m ³ |
| (2) | maximum absorption by weight | 0.75% |
| (3) | minimum compressive strength | 52 MPa (x10 ⁶) |
| (4) | minimum transverses strength | 7.00 MPa (x10 ⁶) |

Strength depends on: mineralogy, texture, grain size foliation, cement types and presence of microfractures.

Porosity: absored water when frozen causes fracturing and physical deterioration. Also porosity is an indication of susceptibility to staining.

- | | | |
|-----|------------------------------|---|
| (5) | polish well | contain a minimum of flaky minerals which create pits in the polish |
| (6) | free from sulfides | in exterior applications will cause rusty stains |
| (7) | low waste factor | uniform bulk texture |
| (8) | low quarry development costs | accessibility and ease of transportation |

CONCLUSIONS AND RECOMMENDATIONS

The Serpentine Project owned by Sun of Heaven Enterprises Ltd. and Golden Eagle Marketing Systems Ltd. covers a belt of serpentized ultramafic rock which appears to be suitable for the manufacture of dimension stone. Alteration products, such as talc and nephrite jade, have been investigated in the past and trial shipments of talc samples were made in 1932.

A quantity of serpentine has been removed in the recent past from the Dewdney Creek Rock Quarry for the Coquihalla Highway construction and maintenance. Measurements documented in this report indicate that 165,000 tons of mainly serpentine has been quarried from two principal benches at the Dewdney Creek site. Micro-fracturing due to explosives in close spaced blastholes is estimated to extend some distance into the quarry face and would need to be removed before raw blocks suitable for the dimension stone market are produced.

Accuracy of the present survey measurements and estimation of material removed used in the tonnage calculation are considered to be reliable to within $\pm 5\%$. Further transit stations could be established at reasonable cost if greater accuracy is required.

Conclusions on the legality of mineral title and resource ownership are beyond the terms of reference of this study and are being actively pursued by legal counsel for the property owners.

Small quantities of nephrite have been produced in the past from the Jade King locality by M. Fulbrook who held the claims since the late 1970's until 1987. Work in 1991 consisted of detail prospecting, geological mapping, backhoe trenching, slab sawing of jade and polishing selected samples.

Initial prospecting focussed on the known jade outcrops exposed in an old rock quarry north of Sowaqua Creek. Additional traverses were made above the quarry within the serpentinite complex. Several other jade boulder float-trains were discovered but their source has not yet been found. Excellent quality, translucent fracture-free, mottled jade of jewellery grade was obtained from material slab-sawed to date. Few impurities, such as chromite or magnetite, are present.

The Jade King deposit, although small as presently exposed, has good potential for additional discoveries. It is the most southerly of all jade occurrences in British Columbia and has ideal access off the new Coquihalla Highway.

Further testing is required but from a preliminary analysis, serpentine suitable for the manufacture of decorative tiles appear to be present in the Project Area in very large quantities.

RECOMMENDATIONS

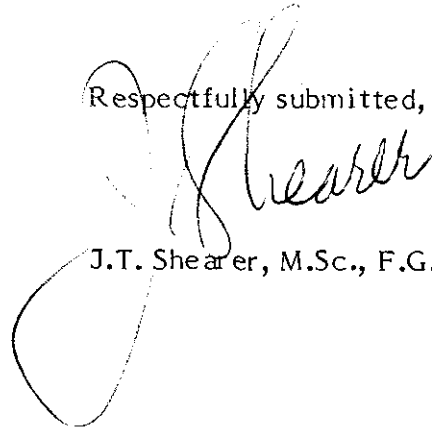
The Jade King jade deposit and surrounding serpentine dimension stone material are in a preliminary phase of evaluation. Although a limited amount of jade is presently exposed, the property has good potential for additional quantities of jewellery quality jade. On-going investigation is required to fully define the type of serpentine that is most attractive to the dimension stone market.

A program of geological mapping, and ground magnetometer surveying is recommended for the Jade King claims. Similarly, geological mapping, base map preparation and ground magnetometer survey are recommended for selected areas on the Serpentine Project claims.

Physical and polishing characteristics of the serpentine material need to be quantified in a systematic manner by the preparation of sample tiles and testing.

A cost estimate for future work is outlined in the next section. The program is subdivided into two, success-contingent phases for the Serpentine Project. All phases for the claims totals \$70,000.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "J.T. Shearer". The signature is written in dark ink and is positioned above the typed name.

J.T. Shearer, M.Sc., F.G.A.C.

Phase I - Serpentine Project

Geological mapping, ground magnetometer orientation survey, loading and transport of serpentine blocks, slabbing and polishing of tile products.

Wages and Benefits

| | |
|--|--------------|
| Senior Geologist: Project supervision, geological mapping, report preparation 12 days at \$300 per day | \$ 3,600 |
| Technologist: Prospecting, site supervision 10 days at \$150 per day | 1,500 |
| Claim line and post checking | 1,000 |
| Loader (loading trucks, assuming quarry is in-active) | 400 |
| Truck (Coquihalla to Surrey, 2 trips) | 800 |
| Tile preparation (limited orientation studies) | 6,000 |
| Market analysis | 2,500 |
| Magnetometer orientation survey | 2,000 |
| Rock sawing and polishing (to test variation in available material) | 1,000 |
| Report preparation, drafting, word processing, reproduction | <u>1,200</u> |
| | \$ 20,000 |

Phase II - Serpentine Project

Contingent on favourable results in Phase I, Phase II would consist of systematic ground magnetometer surveys, preparation of quarry benches and continued manufacturing of sample tiles.

| | |
|--|--------------|
| Wages and Benefits | \$ 5,000 |
| Transportation of material | 4,000 |
| Quarry costs (heavy equipment contractors) | 10,000 |
| Tile preparation | 10,000 |
| Magnetometer survey and line cutting | 8,000 |
| Marketing | 10,000 |
| Report preparation | <u>2,000</u> |
| | \$ 50,000 |

REFERENCES

- Bullis, A.R. (1974): Report on Hope Group and Emancipation Mine for Longbar Minerals Ltd., November 8, 1974, 13 pp., Assessment Report 5440.
- Cairnes, C.E. (1924): Coquihalla Area, B.C., Geological Survey of Canada, Memoir 139, 187 pp.
- _____ (1930): The Serpentinite Belt of Coquihalla Region, Yale District, B.C., Geological Survey of Canada, Summary Report, 1929 Part A, pp. 144-157.
- _____ (1944): Hope Area, Geological Survey of Canada Map 737A, 1 inch = 4 miles.
- Chamberlain, J.A. and Campbell, D.D. (1969): Nickel Distribution in the Coquihalla Ultramafic Belt.
- Chamberlain, J.A. (1970): Progress Report No. 1, Nickel Distribution in the Coquihalla Ultramafic Complex, for Mountain Pass Mines Ltd.
- _____ (1971A): Progress Report No. 2, Nickel Distribution in the Coquihalla Ultramafic Complex for Mountain Pass Mines Ltd.
- _____ (1971B): Geological Report (Menziess-Hornby Project), Coquihalla Property, B.C., May 2, 1971, Assessment Report Number 3000.
- _____ (1972A): Notes on Geology, and Claim Boundaries in Vicinity of Tangent Creek, Jessica Property, B.C., for Mountain Pass Mines Ltd.
- _____ (1972B): Interim Report in 1972 Geochemical Program, Coquihalla Property, for Mountain Pass Mines Ltd., May 3, 1972, Assessment Report Number 3620.
- _____ (1983): Geological Report, Coquihalla Nickel Property, Report for Border Resources Ltd., October 25, 1983, Assessment Report Number 12,340.
- Cochrane, D.R. (1975): Hozameen Gold Belt, Northern Washington and Southern British Columbia, Private Carolin Mines Report, 9 pp., February 5, 1975.
- _____ (1979): Assessment Report on an Aerial Photography Program and Reconnaissance Geochemical Sampling Program on the Jessi Claims, Southern B.C., report for Aquarius Resources Ltd., November 7, 1979, 19 pp., Assessment Report No. 7595.
- Cochrane, D.R. and Griffith, D.J. (1977): Geophysical, Geochemical and Geological Assessment Report on the Hope No. 1 to 32, Mineral Lease M-35 and Spring 1 to 3 (Hope Group), Coquihalla Area for Longbar Minerals Ltd., April 8, 1977, 30 pp., Assessment Report No. 6236.
- Crosby, R.O. and Steele, J.P. (1971): Report on Airborne Geophysical Surveys, Menziess-Hornby Project, April 26, 1971, Assessment Report Number 2999.

- Cristovici, M.A., et al (1983): Investigation to Recover Ni-Co-Fe-Cr from Ore Samples Submitted by Border Resources, Division Report MRP/MSL 83-7 (CR), Mineral Sciences Laboratories (CANMET), Dept. of Energy, Mines and Resources, Ottawa.
- Leaming, S. (1973): Rock and Mineral Collecting in British Columbia. Geological Survey of Canada, Paper 72-83, 138 pp.
- (1978): Jade in Canada, Geological Survey of Canada, Paper 78-19, 59 pp.
- McTaggart, K.C. & Thompson, R.M., 1967, Geology of Part of the Northern Cascades in Southern British Columbia, Canadian Jour. of Earth Sci., Vol. 4, pp. 1199-1228.
- Monger, J.W.H. (1970): Hope Map-Area, West-Half (92HW1/2), Geological Survey of Canada, Paper 69-47, 75 pp.
- Monger, J.W.H. (1977): Upper Paleozoic rocks of the Western Canadian Cordillera and their bearing on Cordilleran evolution. Canadian Journal of Earth Sciences, Vol. 14, page (1832-1859).
- Page, J.W. (1989): British Columbia Dimension Stone Market Study, Public Report under the Canada - B.C. Mineral Development Agreement, March 1989, 44 pp.
- Ray, G.E. (1986): The Hozameen Fault System, and related Coquihalla Serpentine Belt of Southwestern, B.C., Canadian Journal of Earth Sciences, Vol. 23, No. 7 (July 1986), page 1022-1041.
- _____ (1986b): Geology of the Hozameen Fault between Boston Bar and the Coquihalla River, Open File Maps at scales of 1:20,000 and 1:6,000, British Columbia Ministry of Energy, Mines and Petroleum Resources, Open File Maps 86/1-A, B,C,D,E,F.
- _____ (1986c): Geology of Carolin Mine, Southwest British Columbia, Open File Map, 1986/1G, British Columbia Ministry of Energy, Mines and Petroleum Resources, Open File Map 86/1-G.
- _____ (1990): Geology of the Hozameen Fault System and Coquihalla Gold Belt, Southwestern British Columbia, B.C. Ministry of Energy, Mines and Petroleum Resources, Bulletin 79, 97 pp.
- Richards, T. and McTaggart, K.C. (1976): Granitic Rocks of the Southern Coast Plutonic Complex and Northern Cascades of British Columbia, Geol. Soc. Amer. Bulletin, V87, pp. 535-953.
- Shearer, J.T. (1982A): Geological, Geochemical and Geophysical Report on the Ladner Creek North Project, Report for Carolin Mines Ltd., April 30, 1982, 117 pp.

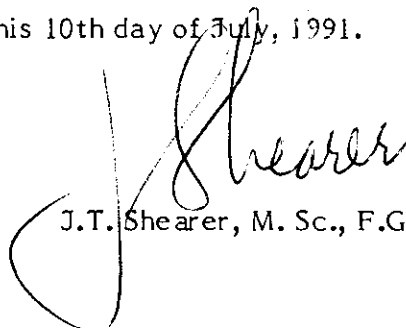
- _____ (1982B): Preliminary Investigation on Sulphide Distribution, Idaho Orebody, Carolin Mines Ltd., unpublished Progress Report, No. 1, September 15, 1982, 22 pp.
- _____ (1988): Diamond Drilling Report on the Aurum Project, Report for Carolin Mines Ltd., February 28, 1988, 28 pp.
- _____ (1989A): Prospecting, Geological and Trenching Report on the Jade King Claims, Report for Osirus Enterprises Ltd., January 15, 1989, 13 pp.
- _____ (1989B): Summary Report on the McMaster Zone, Report for Carolin Mines Ltd., December 5, 1989, 29 pp.
- _____ (1990A): Diamond Drilling Report on the Idaho Zone, Report for Carolin Mines Ltd., January 24, 1990, 36 pp.
- _____ (1990B): Preliminary Geological Report on the Serpentine Project (Dimension Stone Market) for Sun of Heaven Enterprises and Golden Eagle Marketing Systems Ltd., December 28, 1990, 24 pp.
- _____ (1991A): Tonnage Calculation of Rock Removed from the Dewdney Creek Quarry for Highway Purposes, Private Report for Sun of Heaven Enterprises Ltd. and Golden Eagle Marketing Systems Ltd., March 12, 1991, 10 pp.
- Shearer, J.T. and Niels, R.J.E. (1983): Carolin Mines: A Geological Update, Western Miner, November, 1983, pp. 21-24.
- Spence, H.S. (1940): Talc, Steatite and Soapstone; Pyrophyllite Department of Mines & Resources, Canada Bureau of Mines No. 803, 146 pp.
- Tjelta, S.O. (1990): Business Plan, Golden Eagle Marketing Systems Ltd., Private Report, January 1990.
- Von Hahn, H. (1980-1982): Metallurgical Progress Reports 2, 4, 8, 9, 10, 11, 12, for Border Resources Ltd.
- Wright, R.L., Nagel, J., and McTaggart, K.C. (1982): Alpine Ultramafic Rocks of Southwestern British Columbia, Canadian Journal of Earth Sciences, Volume 19, pp. 1156-1173.

STATEMENT OF QUALIFICATIONS

I, JOHAN T. SHEARER, of 1498 Columbia 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 20 years of experience in exploration for base and precious metals and other 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).
4. I am an independent consulting geologist employed since December 1986 by New Global Resources Ltd. at 548 Beatty Street, Vancouver, British Columbia.
5. I am the author of a report entitled "Geological and Trenching Report on the Serpentine (Dimension Stone) Project, Coquihalla Area, British Columbia, dated July 10, 1991.
6. I have visited the property from December 15 - December 16, 1990 and numerous times in January to June 1991. I have carried out geological mapping and sample collection and am familiar with the regional geology and geology of nearby properties. I have worked from February 1981 to March 1984 along the entire Serpentine Belt for Carolin Mines Ltd. I have become familiar with the previous work conducted on the Serpentine Project by examining in detail the available reports, plans and sections, and have discussed previous work with persons knowledgeable of the area.
- 7) I do not own or expect to receive any interest (direct, indirect or contingent) in the property described herein nor in securities of Sun of Heaven Enterprises Ltd. or Golden Eagle Marketing Systems Ltd. in respect to services rendered in preparation of this report.
- 8) I consent to authorize the use of the attached report and my name in the company's Statement of Material Facts or other public document.

Dated at Vancouver, British Columbia, this 10th day of July, 1991.


J.T. Shearer, M. Sc., F.G.A.C.

APPENDIX I

STATEMENT OF COSTS

Serpentine 1 and 2 Groups

STATEMENT OF COSTS
Serpentine 1 and 2 Groups
January - June 1991

| | <u>Serpentine 1</u> <u>Group</u> <u>Jan-May/91</u> | <u>Serpentine 2</u> <u>Group</u> <u>May 1-Jun 11/91</u> |
|---|--|---|
| Wages and Benefits: | | |
| J.T. Shearer, M.Sc., 41 days at \$300 per day | \$ 9,900.00 | \$ 2,400.00 |
| S.L. Shearer, Technician/Saw Operator, 30 days at \$150 per day | 4,000.00 | 500.00 |
| D. Cromarty, Labourer/Saw Operator, 12½ days at \$100 per day | 1,250.00 | - |
| D. Perrett, Driller/Blaster, 2 days at \$160/day | 320.00 | - |
| Transportation: | | |
| 4x4 truck with canopy and tools day at \$40/day | 1,637.60 | 222.00 |
| Fuel | 1,571.62 | 56.00 |
| Hotel and Accommodation | 402.50 | 57.50 |
| Warehouse Rental (Feb 7 - June 11) | 300.00 | 100.00 |
| Meals and Food | 241.99 | 40.00 |
| Supplies, Rentals, Saw, Jaw Crusher, Pump Cost | 1,223.46 | 200.00 |
| Explosives | 185.12 | 27.53 |
| Contract Excavator (Friskey Excavating Ltd.) and Canal Excavating Ltd. | 6,585.50 | 1,700.00 |
| Front End Loader Contract | 1,020.00 | - |
| Contract Drilling & Blasting, benching in Quarry, May/91 | 835.75 | - |
| Highway Closure (for blasting) | 183.60 | - |
| Tandem Truck Rental & HIAB | 642.40 | - |
| Legal Survey | 742.58 | - |
| Drating and Reproduction | 340.00 | 145.00 |
| Filing Fees | 720.00 | - |
| Report Preparation | <u>1,200.00</u> | <u>-</u> |
| Grand Total | <u><u>\$33,302.12</u></u> | <u><u>\$ 5,303.03</u></u> |

Serpentine Group 1 - \$14,200 applied for Assessment May 1/91
Serpentine Group 2 - \$3,500 applied for Assessment June 11/91

\$38,605.15

J. Shearer

APPENDIX II

LIST OF PERSONNEL AND DATES WORKED

Serpentine 1 and 2 Groups

LIST OF PERSONNEL AND DATES WORKED

| <u>Name</u> | <u>Position</u> | <u>Address</u> | <u>Dates Worked</u> |
|--------------|-------------------------------------|---|---|
| J.T. Shearer | Geologist/ Project Supervisor | 1498 Columbia Ave. Port Coquitlam, B.C. V3C 1C3 | Jan 14, 15, 18, 19, 23 Feb 3, 6, 7, 16, 17, 21, 23, 24, 25, 26, 27; Mar 5, 6, 10, 13, 14, 16, 21, 22, 27, 28, 30; Apr 2, 4, 19, 24, 25, 30; May 4, 7, 14, 15, 20, 29; June 4, 10 Total = 41 days |
| S.L. Shearer | Technician/ Saw Operator | 3345 Mason Ave. Port Coquitlam, B.C. V3C 3V4 | Jan 21, 22, 26, 27; Feb 2, 3, 7, 16, 24, 25, 26; Mar 5, 6, 7, 8, 9, 13, 14; Apr 2, 3, 4, 24, 25, 26; May 4, 5, 6, 7; June 2, 3 Total = 30 days |
| D. Cromarty | Labourer/ Saw Operator | 634 Wallace Street Hope, B.C. V0X 1L0 | Jan 18, 19, 23; Feb 3, 6, 7, 16, 17; Mar 5, 6, 10, 13 Total 12½ days |
| D. Perrett | Driller/ Blaster | 6697 Arcola Street Burnaby, B.C. V5E 1H2 | Mar 5, 6 Total = 2 days |
| R. Grioday | Labourer | Ste. 123 - 104 Ave. Surrey, B.C. V3T 1W4 | Apr 3, 4, 24, 25 |

APPENDIX III

LIST OF SURVEY STATIONS

WITH ELEVATIONS, LATITUDE, DEPARTURE
AND DESCRIPTION

S. Nickel, B.C. Land Surveyor

February 16, 1991

NEW GLOBAL RESOURCES

CONTROL TOPOG - PIT SITE

16 FEB 91 - STAN NICKEL, B.C.L.S. - FILE 91014

| STATION | NORTHING (From directions derived by compass) | EASTING | ELEVATION (ASSUMED) |
|---------|--|---------|------------------------|
| 1 | 200.0 | 200.0 | 100.0 |
| 2 | 163.5 | 305.9 | 99.1 |
| 3 | 160.1 | 339.8 | 113.1 |
| 4 | 160.0 | 370.6 | 126.2 |
| 5 | 155.1 | 402.7 | 139.8 |
| 6 | 152.4 | 437.2 | 149.3 |
| 7 | 194.4 | 434.0 | 154.0 |
| 8 | 260.3 | 434.7 | 145.2 |
| 9 | 290.8 | 390.1 | 134.7 |
| 10 | 245.1 | 372.7 | 127.3 |
| 11 | 191.1 | 393.0 | 143.9 |
| 12 | 310.8 | 337.6 | 110.6 |
| 13 | 260.8 | 307.4 | 113.9 |
| 14 | 220.0 | 309.6 | 111.4 |
| 15 | 190.2 | 321.0 | 07.7 |

NEW GLOBAL RESOURCES

CONTROL TOPOLS - PIT SITE

16 FEB 91 - STAN NICKEL, B.C.L.S. - FILE 9101A

STATION

DESCRIPTION

- 1 rebar set @ pit entrance - assumed elev = 100.0m
- 2 break @ toe of gravel slope @ S. limit
- 3 on rock outcrop partway up S. limit (over S. rim crater)
- 4 top of break in gravels " " " "
- 5 break " " " "
- 6 break @ top @ S. limit - just W. of creek
- 7 on top of uppermost rock cut
- 8 @ upper junction of N. access roads (near log barrier)
- 9 top of tailings ridge @ N. end pit (gravels)
- 10 top of rock cut @ mid level
- 11 top of gravel ridge mid-level ~ midline pit
- 12 @ lower turn of N. access road - near boulders
- 13 top ridge of broken rock
- 14 top rock outcrop over N. rim of crater
- 15 bottom of crater @ toe

NEW GLOBAL RESOURCES

CONTROL TOPOG - JADE KING SITE

16 FEB 91 - STAN NICKEL, B.C.L.S. - FILE 91014

| STATION | NORTHING (from directions compass derived) | EASTING | ELEVATION (from 1974 Ref Mon) |
|---------|---|---------|----------------------------------|
| 1 | 200.0 | 200.0 | 329.4 |
| 2 | 88.3 | 150.7 | 325.6 |
| 3 | 69.8 | 199.4 | 333.0 |
| 4 | 43.5 | 144.1 | 335.0 |
| 5 | 61.0 | 218.6 | 342.0 |
| 6 | 61.9 | 241.7 | 349.9 |
| 7 | 61.9 | 252.0 | 354.7 |
| 8 | 47.3 | 248.5 | 359.7 |
| 9 | 67.0 | 274.8 | 359.2 |
| 10 | 85.3 | 256.4 | 340.8 |
| 11 | 86.6 | 282.1 | 342.6 |
| 12 | 92.1 | 303.0 | 342.4 |
| 13 | 325.7 | 313.7 | 333.7 |

35
11.0

NEW GLOBAL RESOURCES

CONTROL TOPOG - JADE KING SITE

16 FEB 91 - STAN NICKEL, B.C.L.S. - FILE 9101A

| STATION | DESCRIPTION |
|---------|--|
| 1 | rebar set in east shoulder of Coquihalla Highway |
| 2 | approx. location of 11 th post "Steven" claim |
| 3 | @ W. end trench |
| 4 | on E road |
| 5 | @ mid landing |
| 6 | mid point - upper road |
| 7 | upper corner |
| 8 | top of pit |
| 9 | end of top road |
| 10 | start of lower road |
| 11 | outcrop on lower road |
| 12 | end of lower road |
| 13 | M ⁰ TH Ref. Mon (derivation of elevations) |

APPENDIX IV

NOTES ON ACCURACY
OF SURVEY STATIONS

S. Nickel, B.C. Land Surveyor



STAN NICKEL

B.C. Land Surveyor

LEGAL & TOPOGRAPHIC SURVEYS

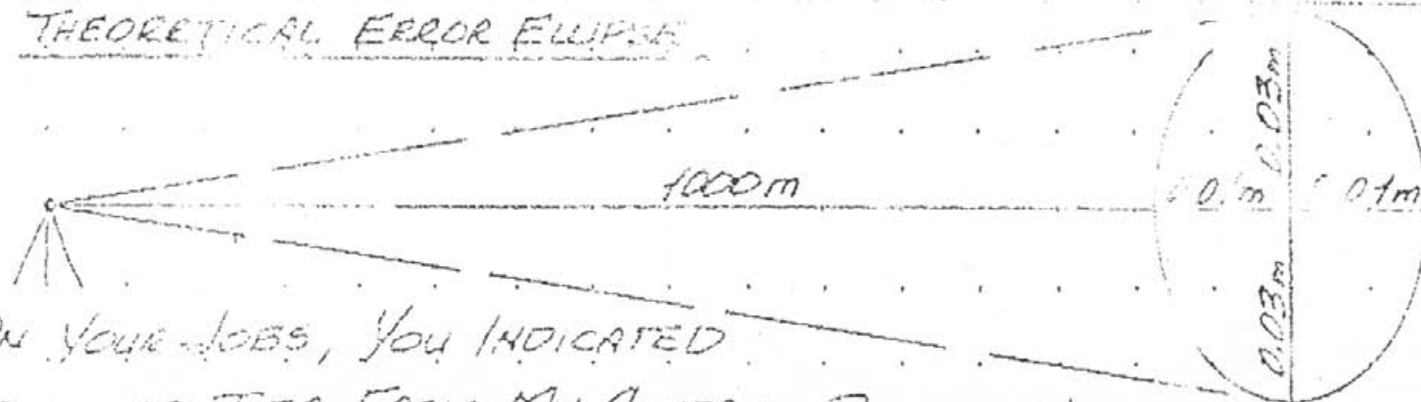
FACSIMILE COVER SHEET

FILE: 91014 DATE: 08 MAR 91
 TO: JOE SHEARER FROM: STAN NICKEL
NEW GULF RESOURCES
 FAX NUMBER: 1-604-3854 NUMBER OF SHEETS INCLUDING THIS COVER: 1

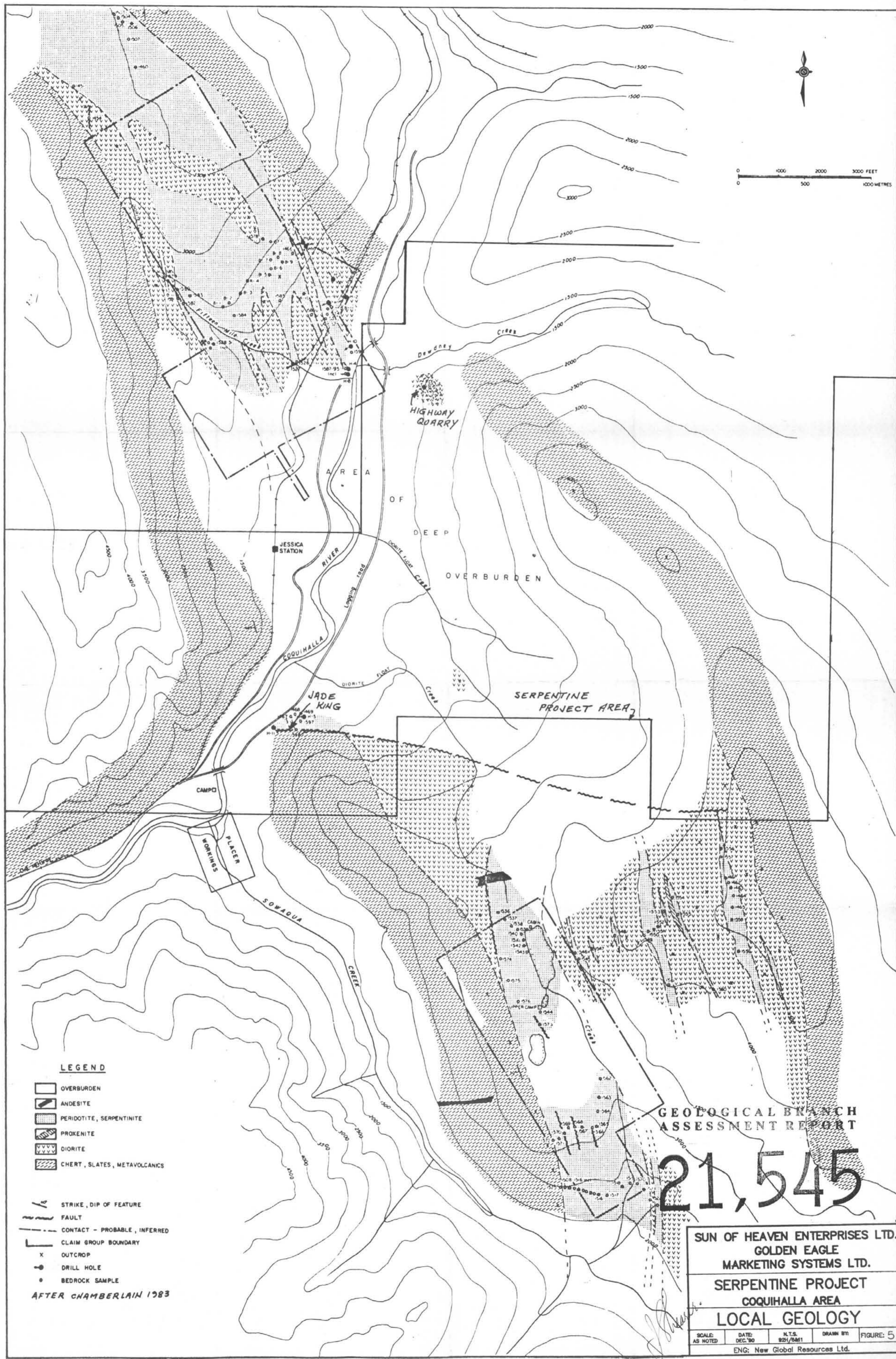
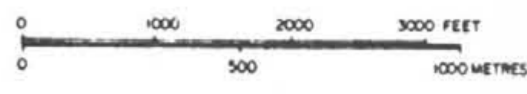
MESSAGE FURTHER TO YOUR REQUEST FOR ACCURACY SPECS FOR CONTROL SURVEYING

| MEASUREMENT | INSTRUMENT | STANDARD DEVIATION |
|-------------|--------------|---|
| DIRECTIONS | WILD T1000 | $\sigma = \pm 6$ SINGLE FACE |
| DISTANCES | WILD DI 1000 | $\sigma = \pm 5 \text{ mm} + 5 \text{ ppm}$ |

THEORETICAL ERROR ELLIPSE



ON YOUR JOBS, YOU INDICATED FURTHER TIES FROM MY CONTROL POINTS WOULD BE BY COMPASS & INCLINOMETER (VERY COARSE METHODS), AND THEREFORE WE TIED TOPOGRAPHICAL POINTS WHOSE POSITIONS MUST NOT BE CONSIDERED MORE ACCURATE THAN $\pm 0.1\text{m}$



LEGEND

- OVERBURDEN
- ANDESITE
- PERIDOTITE, SERPENTINITE
- PROKENITE
- DIORITE
- CHERT, SLATES, METAVOLCANICS

- STRIKE, DIP OF FEATURE
- FAULT
- CONTACT - PROBABLE, INFERRED
- CLAIM GROUP BOUNDARY
- OUTCROP
- DRILL HOLE
- BEDROCK SAMPLE

AFTER CHAMBERLAIN 1983

**GEOLOGICAL BRANCH
ASSESSMENT REPORT**

21,545

SUN OF HEAVEN ENTERPRISES LTD.
 GOLDEN EAGLE
 MARKETING SYSTEMS LTD.
 SERPENTINE PROJECT
 COQUIHALLA AREA
 LOCAL GEOLOGY

SCALE: AS NOTED DATE: DEC '90 N.T.S. 821/0481 DRAWN BY: FIGURE: 5
 ENG: New Global Resources Ltd.