

676941  
092F319 v 1994 Lake

## QUINSAM COAL MINE

### Introduction

At the present time the Quinsam Coal Mine, which is a 550,000 tonne per year underground operation west of Campbell River, is only one operating coal mine on Vancouver Island. The only other mine which operated during the past three decades is the Wolf Mountain Mine near Nanaimo, which produced less than 120,000 tonnes before shutting down

The Quinsam Coal Mine is located approximately 24 km southwest of Campbell River, approximately midway up the east coast of Vancouver Island. The Quinsam Property was initially explored by a Joint Venture Agreement between Weldwood of Canada Limited (the fee-simple coal rights owner) and coal operator Luscar Ltd. of Edmonton, Alberta. Luscar is a privately owned company and one of the larger Canadian coal producers, with several mines in Alberta and Saskatchewan. Some 500 coreholes and drillholes were drilled on the Quinsam Property between 1976 and 1980.

The Quinsam Mine was initially designed as an open pit mine to a maximum cover depth of 61 metres (200 ft.). The original concept was for a 15 year open pit mine life, at a production rate of 910,000 clean tonnes, with some undetermined possibilities for an underground mining at the same time as or after the open pit operation. In mid 1981, Luscar Ltd. withdrew from the project and Brinco Mining Ltd. took over Luscar's position. Brinco reviewed the overall mine plan, made some changes and adjustments, and after bringing in a number of experts to evaluate some of the more sensitive issues of the mining proposal, submitted an Addendum to the Luscar Stage II Submission in August of 1982. Approval-in-Principle was then granted for the Project, subject to a Public Inquiry which was conducted in 1983.

Concurrent with the additional mine approval work, Brinco Mining Ltd. performed a detailed Mine Technical Review and Feasibility Study. Additional exploration work was conducted to provide more information on coal quality.

When the coal price began a substantial and prolonged decline, the new operator elected to substitute the large open pit development plan with a smaller scale open pit operation, a protracted start-up, and immediate plans for limited underground development. Under this scenario, the project began in 1985 with small scale bulk samples to test the suitability of the coal in the export market.

In 1986, the first open pit was developed on the property. This was in the 2N area on the north side of Middle Quinsam Lake, where the No. 1 Seam is of sufficient quality to mine without washing. The mine is serviced by a 25 kv powerline from the B.C. Hydro feeder line located 8 km north on Highway 28.

Between 1987 and 1994, open pit operations were a significant part of overall mine development, although not on a scale originally planned. Aggregate open pit production approached 1.2 million tonnes during this 7 year period. The biggest single year of open pit production was 1992, when 300,000 tonnes of clean coal were produced from the open pit mine out of the total 486,000 tonnes clean product (balance coming from the underground mine).

In 1990, an underground test mine was installed and gradually underground production increased from less than 120,000 clean tonnes in 1990 to 180,000 clean tonnes in 1992 and over 400,000 clean tonnes in 1993 (75 % of total mine production). By the end of the first quarter 1994, open pit mining had ceased and underground mining methods accounted for all of the mine production. The current method of mining underground is a conventional room and pillar method, with main development advance on three parallel headings, 6 metres wide on 36 metre centres. Sections are turned off the main development and advanced on 5 or more headings of the same general configuration as the main development. Two metre long resin point anchor roof bolts on a 1.2 metre by 1.2 metre pattern are installed in all main development and section development roadways for roof support.

When the sections are advanced to a pre-determined point the support pillars are removed on a retreating system back as far as the protective barrier pillar at the main development, and the overlying roof strata is allowed to cave.

The underground operations consist of two separate underground mining areas, the 2-North and 2-South Mines. A third mine (the 4-South Mine) is presently being permitted and developed. This mine will replace the short-lived 2-South Mine which, will be exhausted some time in 1996.

#### The 2-North Mine

This mine is accessed by two parallel portals installed near the toe of the worked-out open-pit highwall in the 2N Open Pit. The main conveyor delivers run-of-mine coal directly to an open stockpile near the dump pocket of the Coal Preparation Plant.

A 50 metre by 3 metre diameter vertical ventilation raise equipped with main and secondary exhausting fans provides ventilation for the underground workings, with intake air being drawn in via the supply portal and main conveyor portal. The 2-North and 3-North deposits (both of which will be interconnected) represent more than 60% of the total mine reserve base and coal from this mine will provide most of the low sulphur No. 1 Seam feedstock for the projected 15 year life of the operation, with some of the satellite operations providing higher sulphur No. 3 Seam coal for blending off.

At the present time (June/95) the mine is equipped with two 1100 volt continuous miner sections, consisting of the following:

- one Joy 12CM/11 continuous miner
- two Joy 10SC/22 shuttle cars
- one Fletcher DM roofbolter
- one Stamler feeder/breaker
- one Eimco 3.5 cy Scooptram Supplies Vehicle

Currently, two more sections of equipment are being reconditioned for installation into the mine later in 1995.

#### The 2-South Mine

The 2-South Mine is located 4.5 km south of the existing Coal Preparation Plant. This one-section mine is an extension of the 2S and 3S open pits, and consists of a set of three parallel underground entries accessing the No. 1 Coal Seam from the toe of the 2S pit highwall. The equipment used is identical to that used in the 2N Underground Mine. The mine operates under a maximum cover depth of 80 metres, with a maximum length of advance of approximately 1 km. Structural boundaries and thinning of the No. 1 Seam on all sides limit the extent of the underground workings, so that the reserves will likely be exhausted some time in 1996.

#### Coal Preparation Facilities

With the advent of the underground mine in 1990, a coal preparation plant was required to clean the increased dilution from the mined, coal in order to produce an acceptable export product. A small heavy media bath type coal preparation plant with a capacity of 100 tonnes per hour was installed and commissioned in February of 1991. Later that same year two water-only cyclones were added on to the circuit. While the plant is adequate for a 600,000 tonne per year operation, expansion is required to bring the production level up to 1,200,000 tonnes per annum. Work on this expansion is presently underway, and includes the addition of a complete heavy media cyclone circuit with dewatering capability in the form of basket centrifuges.

### Current and Projected Production Levels

The Quinsam Mine, which currently employs about 140 people, is producing at an annual rate of approximately 550,000 clean tonnes from three underground continuous miner sections. This year capital expenditures at the mine in the form of additional mining sections and an expanded Coal Preparation Plant, will bring annual production up to a projected 1.2 million clean tonne level. Concurrently, the company has arranged financing from the British Columbia Government in the form of a repayable loan to upgrade the existing road and port facilities.

### Existing Transportation Infrastructure

The Quinsam Mine is accessed by 20 km of paved highway west of Campbell River (Highway 28 to Gold River). The Argonaut Mainline, an all-weather Forest Service Road, leads to the mine property, 8 km south of the Highway 28 intersection. Total road distance to a Federal Harbours and Ports multi-user Barge Ramp Facility, which is used for loading out coal product, is 33 km.

Currently the mine employs 25 contract owner-operated haul trucks to transport coal product to the tidewater barge loading facility at Middle Point, 8 km. north of Campbell River. Trucks offload on to the 5,800 tonne barges using a set of portable steel ramps. The barges are trimmed by a front end loader. The Middle Point Bargeloading facility is located just south of Middle Point and 2 km north of the Elk Falls Pulp Mill at Campbell River. This facility is operated by Canadian Coastguard for Harbours and Ports Canada. It is presently servicing the Quinsam Coal Mine and other industrial users who use the facility for transshipping of heavy mobile equipment to and from the coastal logging operations, supply and servicing to aquaculture facilities and other industrial users such as scrap metal recyclers. Coal from the Quinsam Mine makes up more than 90% of the total revenues at the facility at present. This year the facility is being upgraded to accommodate coal barges at the end of the causeway, leaving the existing berth totally available for other traffic.

The barges then transport the coal product approximately 60 km. to a coal stockpiling and shiploading facility on Texada Island, at the old Texada Iron Mines location, now owned and operated by Holnam West Materials Ltd. This is the only shiploading facility currently available for the bulk loading of coal product is the Texada Island facility. It was refurbished in 1989 and became operational in 1990. Located on the northwestern shoreline of Texada Island, the facility is well-protected from the southeasterly winter storms. The original wooden piling structure is slowly being replaced by steel and all dolphins are now steel. The twin loading conveyor booms and all conveyor components have been refurbished.

The facility is capable of delivering up to 2,000 tonnes per hour on to the ship. An operational average delivery rate is between 1,200 and 1,500 tonnes per hour. The coal product is reclaimed from the 150,000 tonne stockpile area by front-end loader and trucks dumping into the main conveyor feed. Barges are unloaded utilizing the same front-end loader and truck system at the same time as ship-loading operations are taking place. The trucks dump directly into a 150 tonne hopper which feeds the main conveyor of the shiploader via two variable speed feeders. The shiploader consists of two independent conveyor jibs out to a set of dolphins, fed from a shore-based dump pocket and main conveyor.

Ships up to Panamax size (70,000 tonnes) currently use the facility, which has a water depth of 13.7 metres at 0 tide. The dolphins are designed to handle larger Cape Size vessels (H. Diggon, Ops. Manager, pers. comm.). Minor additions to the shiploading equipment would be necessary to load the wider Cape Size vessels.

Proposed improvements in barge loading and unloading systems using conveyors will increase the efficiency of the total operation from mine to ship. Even at the current level of usage, the Texada Facility is the most cost effective to the coal shipper of the coal ports on the British Columbia coast.

The Texada Facility is well-positioned to service other potential coal-producing areas along the east coast of Vancouver Island by virtue of its location in the Strait of Georgia.

While it is possible that the Roberts Bank Coal Terminal, operated by Westshore Terminals at Tsawwassen (south of Vancouver), could receive and handle bulk coal shipments from Vancouver Island, at the present time there are no facilities in place to receive and off-load barges. Engineering designs and capital cost estimates have been done in the past in this regard.

Holnam operates a limestone quarry at the site in addition to handling and storing the coal product for Quinsam on a contractual basis. The shiploader, which was upgraded by Holnam and Quinsam in 1990, consists of two independent conveyor jibs out to a set of dolphins, fed from a shore-based dump pocket and main conveyor. The coal product is reclaimed from the 150,000 tonne stockpile area by front-end loader and trucks dumping into the main conveyor feed. Barges are unloaded utilizing the same front-end loader and truck system.

#### Transportation Infrastructure Upgrading

With financing in the form of a repayable loan from the British Columbia Provincial Government through the British Columbia Transportation Financing Authority, Quinsam has embarked on a Transportation Upgrade Project. This project entails:

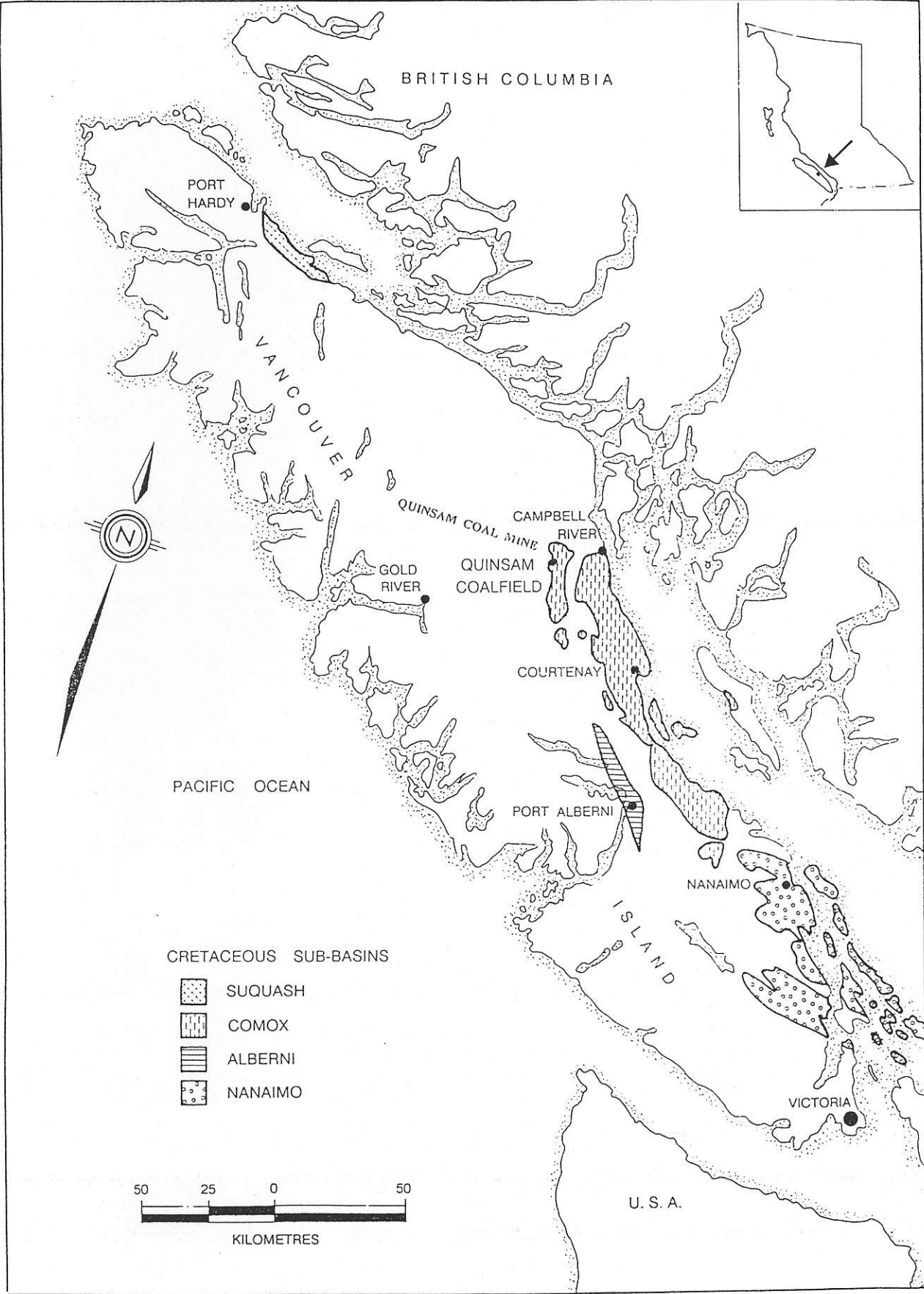
- a) Upgrading the 8 km of Forest Service road and mine access road with asphalt hard-top, and
- b) Building a conveyor barge-loader and covered coal storage building at the Harbours and Ports Middle Point Marine Bargeloading Facility.

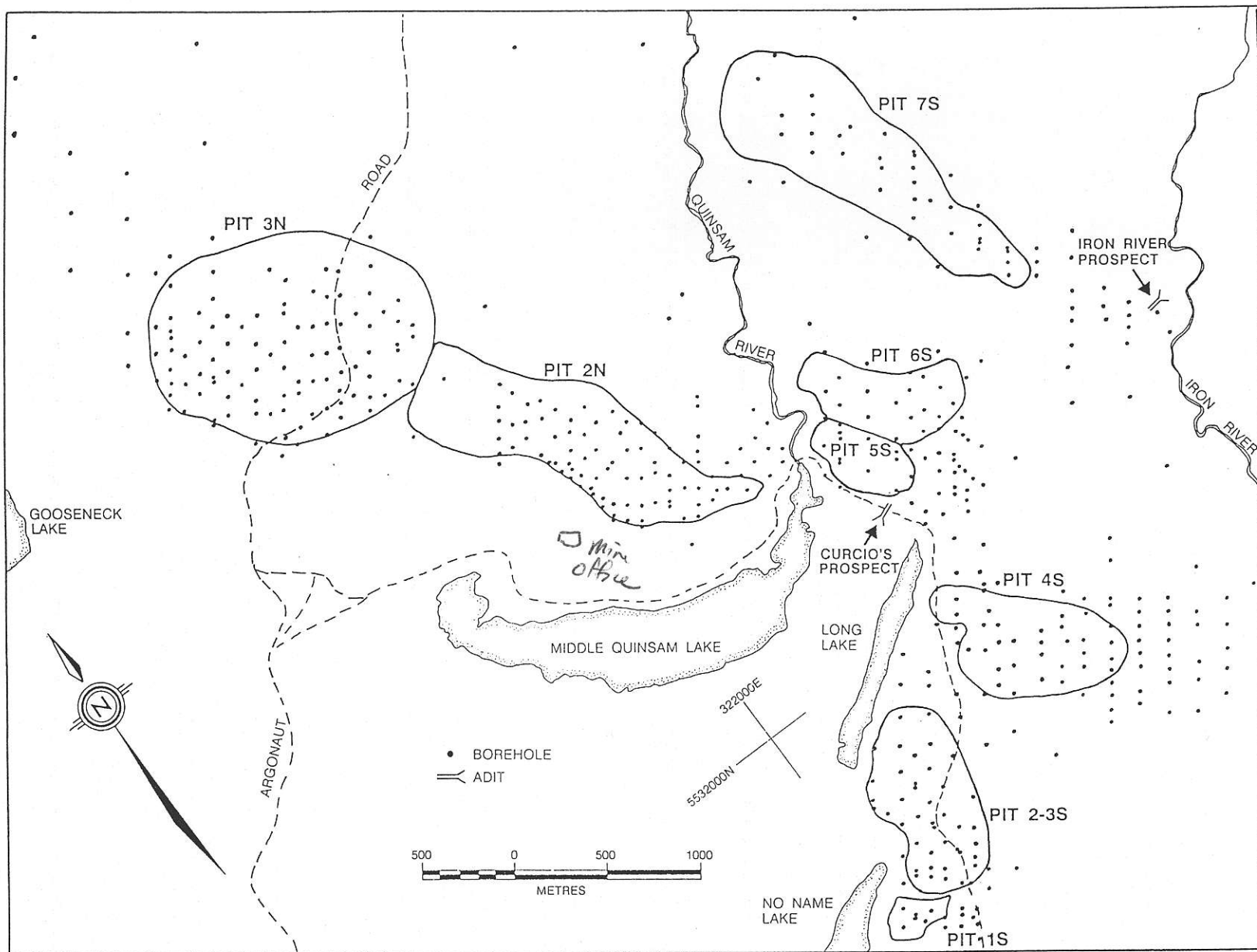
The transportation upgrade will benefit Quinsam Coal in the following ways:

- 1) The road paving, together with the 20,000 tonne covered coal storage facility at tidewater, will allow the use of larger "B"-train truck units hauling on a more regular frequency than the "campaign" type loading practice where 25 trucks are on the road all at once when the barge arrives. This will reduce the truck haul frequency, and allow for more competitive transportation pricing due to the larger payloads and regular schedule.
- 2) The conveyor barge-loading system will reduce the demurrage time for loading barges from the current 14 hour loading sequence to about 5 hours. It will also reduce the amount of coal spillage and associated environmental problems inherent in the current system of trucks and equipment running on the coal as the barge is being loaded.
- 3) The upgraded road will provide safer access to the mine for its employees and suppliers, and eradicate the tracking of mud on to Highway 28, creating safer conditions for the travelling public.

The existing Middle Point Facility will not be affected by the installation of the barge-loader and other users will benefit by the removal of Quinsam Coal barge traffic in the existing berth.

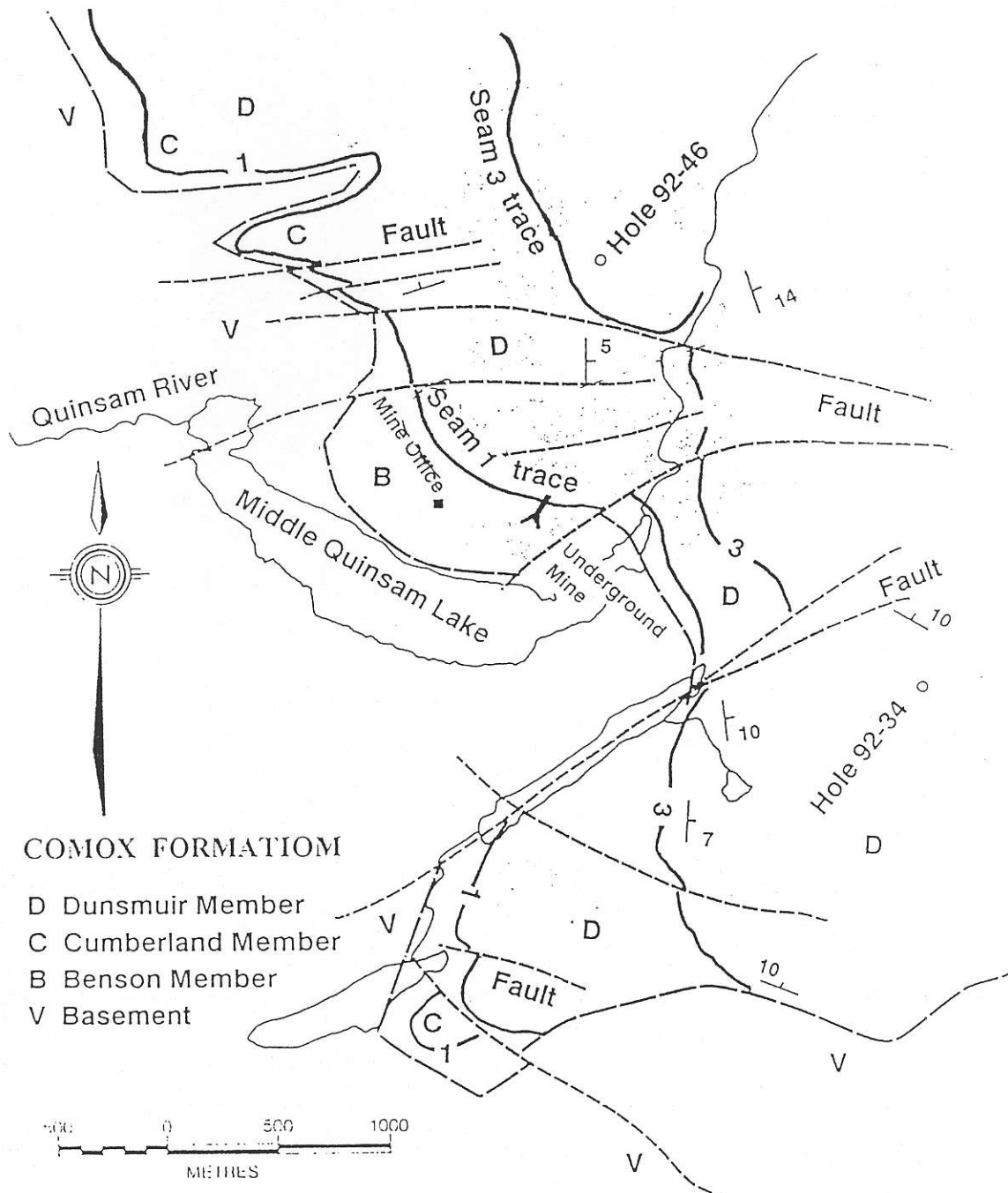
The Coal Storage and Bargeloading Facility will be functional throughout the projected 15 year life of the Quinsam Mine. During this period, the facilities would presumably be available to other potential coal mines in the area. The facility is amenable to the transfer of other mineral products such as construction aggregates and limestone, or forest products such as hog fuel or wood chips, after coal mining ceases.





# QUINSAM COAL MINE GEOLOGICAL MAP

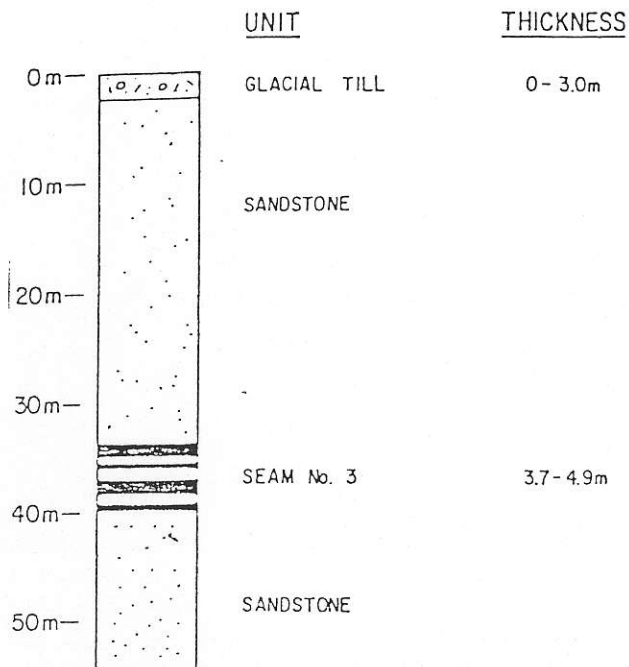
## VANCOUVER ISLAND COMOX COALFIELD



### COMOX FORMATION

- D Dunsmuir Member
- C Cumberland Member
- B Benson Member
- V Basement

# TYPICAL STRATIGRAPHIC SECTION - 4S & 6S



# TYPICAL STRATIGRAPHIC SECTION - 2N, 3N, 5S, 2-3S

